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Convening Canada's AgeTech ecosystem: Aligning standards, pathways, and governance to support implementation and adoption

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Abstract
Background: Despite significant investment and innovation in the AgeTech sector, widespread adoption and integration into health and social care systems remain limited. Persistent barriers, including fragmented design standards and unclear implementation pathways, stifle scale.
Objective: This perspective paper proposes a four pillar "Trust Framework" to provide a unified governance roadmap for the Canadian AgeTech ecosystem bridging the gap between innovation and real-world impact.
Synthesis of the perspective: The framework was synthesized from existing academic literature, international standards, and stakeholder discussions within Canada's AgeTech network. It addresses the regulatory vacuum between regulated "MedTech" and broader "Wellness Tech". The four pillars include: (1) guidelines and standards for AgeTech development; (2) evidence-based impact and accountability mechanisms; (3) defined pathways for integration; and (4) informed consumer access and empowerment.
Conclusion: By anchoring governance in principles of transparency, integrity, and equity, the Trust Framework calls developers, policymakers, researchers, and older adults to act. Implementing this holistic approach will position Canada as a global leader in trustworthy, evidence informed AgeTech that enhances the dignity and well-being of older populations.

Keywords: AgeTech, governance; trust framework, implementation science, standards, Gerontechnology, Canada

Introduction

Technologies designed to improve the lives of older adults represent a promising avenue to expand choices and enhance well-being. AgeTech includes hardware and software solutions designed for, co-created with, or adopted by older adults and caregivers to support their needs and well-being.

Over the last 20 years, research and innovation in AgeTech has grown exponentially (Bergschold et al, 2024), with a corresponding increase in proposed and developed solutions (Etkin, 2022). In Canada, this innovation arrives at a critical juncture as public health and social care systems face unprecedented demographic and workforce pressures. However, widespread integration across the country has stalled. (Grigorovich et al., 2021; Kokorelias et al., 2025; MacNeil, Koch, Kuspinar, Juzwishin, Lehoux, & Stolee, 2019). Within the Canadian federation, these challenges are compounded by a fragmented healthcare landscape where jurisdiction is divided between federal regulatory approvals and provincial/territorial delivery systems. Consequently, promising innovations frequently remain trapped in localized, short-term pilot phases.

These barriers are compounded in the consumer AgeTech space, where older adults may resist adopting technologies if they conflict with the user's self-perception and evoke feelings of dependence (Astell, McGrath, & Dove, 2020). Additional obstacles include concerns around privacy, data security, and the potential misuse of personal information (Vitak & Shilton, 2020; AgeTech Collaborative, 2024). Globally, these adoption barriers are magnified by a persistent digital divide, where inequitable access, digital literacy gaps, and socio-economic disparities

shape uneven patterns of use and uptake (Neves et al., 2018; Kärnä et al., 2022). In Canada, this divide manifests through distinct geographic and socioeconomic challenges; older adults and care partners in rural, remote, and northern communities face acute infrastructure deficits, high connectivity costs, and limited local support networks that severely restrict technology deployment (Freeman et al., 2022). Without a coordinated governance approach for design, evaluation and deployment, AgeTech risks entrenching uneven health outcomes, benefiting only affluent or urban populations while leaving vulnerable and geographically isolated groups further underserved.

Defining AgeTech

AgeTech encompasses innovations that promote aging in place, safety, security, healthy aging, and social connectivity, including digital health solutions, assistive technologies, Internet of Things (IoT) applications, home based medical devices, robotics, wearables, and sensor-based technologies (Genge et al, 2023).

AgeTech can be categorized into regulated "medical devices" and broader "wellness technologies", which are subject to variable regulatory oversight (Devine et al, 2022). While medical devices undergo rigorous design, development, validation, and approval processes to ensure compliance with health and safety regulations, "wellness" and consumer-facing products, such as smart watches, digital apps and fall detection systems, typically do not require similar rigorous validation and regulatory scrutiny unless they make explicit medical claims. These products reach the market faster, raising concerns related to safety, privacy, and efficacy.

Moreover, the AgeTech landscape includes tools for caregiving, communication, social engagement, and independent living that may fall outside traditional medical or wellness categories but are nonetheless central to aging in place and healthy longevity. This definition underscores governance complexities across design, regulation, deployment, and evaluation.

To clarify the scope of AgeTech addressed in this work, *Table 1* outlines a taxonomy that reflects the range of technologies developed for or adopted by older adults and caregivers. The taxonomy distinguishes between Wellness Tech and MedTech, recognizing that both contribute to the AgeTech ecosystem but follow distinct governance, regulatory, and adoption pathways. This framing contextualizes the barriers and solutions discussed in subsequent sections.

Conceptual design and provenance

Addressing the implementation gap in AgeTech requires a governance approach that fosters trust through transparent, accountable, and standards-based implementation. Trust is built through perceived integrity, competence, and benevolence (Mayer et al., 1995) and is reinforced through transparency and accountability (Cvitanovic et al., 2021). This paper outlines a governance "Trust Framework" that operationalizes these principles in the Canadian context.

The Trust Framework is a conceptual roadmap developed to bridge the gap between identified research needs and system-level implementation; it represents a strategic synthesis of academic evidence and operational insights from the Canadian AgeTech landscape. The development of the four pillars was a proactive effort to translate documented sector gaps and operational failure points directly into a structural governance logic. Rather than relying on a singular empirical dataset, the framework was developed by systematically aligning barriers identified by the industry with corresponding policy levers, moving the sector from a descriptive account of challenges toward an actionable roadmap.

The development of the Trust Framework is situated within socio-technical systems theory, which emphasizes that technical innovation does not exist in a vacuum but is linked to social and organizational contexts (Mumford, 2000; Trist, 1981). Technical efficacy alone is insufficient without trust and accountability.

By utilizing an inductive theory-building approach, the authors developed a structured governance model grounded in longitudinal lived experience and observation of the Canadian AgeTech landscape. This process synthesized real-world failure points into a theoretical roadmap addressing the dual requirements of technical integrity and social trust. The resulting framework responds to the governance vacuum, arguing that systemic readiness is only achievable when technical standards and evidence of efficacy are explicitly linked to the social drivers of necessity, accountability and consumer confidence.

The provenance of this perspective is rooted in a trajectory that began with strategic evidence gathering initiated within the National Research Council of Canada (NRC) Aging in Place Challenge Program. This recognized need for a more coordinated approach to governance led to a collaborative study undertaken by the Canadian Standards Association (CSA), AGE-WELL, academic partners, and the NRC to investigate the standards and guidelines landscape. This col-

Table 1. Taxonomy of AgeTech categories

	AgeTech	
	Wellness Tech	**MedTech**
Claims made	No explicit medical claims, though often alludes to wellness benefits	Explicit medical claims
Regulatory oversight	Typically unregulated, no independent verifications of claims required	Regulated by Health Canada
Pathways for scale and spread	Direct to consumer sales, driven by market demand	Scale and spread through Health Technology Assessment (HTA), health system commissioning or insurance models
Adoption Barriers	Adoption limited to those with economic means, lack of consumer trust	Slower path to market, high regulatory and financial entry barriers, duplication of HTA or commissioning processes
Cross cutting concerns	Trust, product-user fit, interoperability, privacy, and security	

laboration resulted in a comprehensive review by Abhari et al. (2024), which confirmed that while AgeTech research has historically emphasized design aspects, it lacked attention to foundational aspects such as privacy, security, interoperability, and data quality. Specifically, the review identified that the absence of standardized requirements in these technical areas makes it difficult for health systems to evaluate the safety and readiness of new technologies, often preventing innovations from moving beyond small-scale pilots into broader systemic use.

Crucially, the impetus for this framework extends beyond health system integration to address the direct-to-consumer AgeTech market. This market equally suffers from a lack of trust, as older adults and their caregivers often lack the necessary supports to make informed decisions about the safety and data practices of the devices they purchase. The inclusion of informed consumer decision supports in this framework emerges directly from many years of engagement and feedback from older adult advisory committees within the NRC and AGE-WELL networks. These sustained conversations identified a clear demand for greater transparency and independent verification of consumer technologies.

With this evidence gathered, the authors engaged in an iterative process to map the identified gaps against the requirements for both system readiness and consumer safety. This mapping involved synthesizing the Abhari et al. (2024) findings with evidence regarding adoption barriers, specifically the fundamental lack of trust identified by Paquette et al. (2024) and others (Vitak & Shilton, 2020; AgeTech Collaborative, 2024). Through this inductive process, the four pillars of the Trust Framework were derived to fill the governance vacuum between clinical MedTech and broader Wellness Tech. By articulating consistent, transparent expectations for safety, evaluation, and scaling, this framework provides a scholarly and operational foundation for a more coordinated approach to AgeTech governance. This perspective is offered as a necessary roadmap for moving the sector toward a rigorous, standards-based framework that ensures technologies for aging are safe, tested, and trustworthy. While individual challenges such as fragmented design standards, evaluation complexities, and scaling barriers are well-documented in isolation, existing literature and implementation science frameworks frequently treat them as distinct workstreams. The novelty of the proposed Trust Framework lies in its systemic synthesis: it introduces a unified governance logic that explicitly bridges the regulatory and operational vacuum between clinical MedTech and consumer-facing Wellness Tech. By structurally linking technical integrity (standards) and empirical competence (evaluation) directly to health system readiness and consumer empowerment, this framework advances existing knowledge, moving beyond a descriptive account of barriers toward an interdependent, actionable roadmap tailored to the Canadian context.

AgeTech sector challenges and a proposed path forward

Challenge 1: Fragmented or absent design standards raise questions of integrity and safety

Technology is advancing rapidly, yet regulations, standards and ethical frameworks have not kept pace, particularly in the digital devices landscape, for artificial intelligence (AI)-based applications and products that collect or make use of sensitive health data such as wearables. In the absence of coherent standards, the overall integrity of the AgeTech ecosystem is difficult to establish, creating uncertainty about which products can be trusted to adhere to best practices in privacy, data protection and equity. While some older adults are willing to trade privacy for perceived safety (Schomakers & Ziefle, 2023), this must be an informed choice, grounded in clear standards for privacy, accessibility, and data quality and security among others.

For technologies seeking integration with the healthcare system (MedTech), concerns about privacy, safety, cybersecurity, and compatibility with digital health records do not just impact perceived integrity, they can act as barriers that slow adoption (Virtual Care Task Force, 2020). These systems operate under high regulatory scrutiny, yet they often lack clear national guidance on acceptable thresholds for performance, risk management, and integration. For consumer-oriented AgeTech (Wellness Tech) like wellness apps, wearable devices, or home-based sensors the challenge is equally critical. These products typically fall outside traditional health regulatory pathways, but still collect and process sensitive personal data. Without clear standards for privacy, security, data quality and data ownership, users face uncertainty and potential risks

related to the quality of their data, how it is used and shared, which may in turn act as a barrier to adoption (Paquette et al., 2024). AI-driven features in these devices exacerbate the issue, as older adults are often underrepresented in the datasets used to train these algorithms, leading to biased performance and inequitable outcomes for this population (Paquette et al., 2024, Mace et al., 2022)

Further, Stamate et al. (2024) argue that design and adoption challenges are not merely technical but deeply user-centered. Many digital products fail because they do not sufficiently reflect the heterogeneity of older adults' capabilities, preferences, or contexts (e.g., cultural differences, digital literacy). The authors advocate for a multifaceted approach to design that includes co-creation methods, rigorous measures of digital literacy (beyond self-report), and adoption models inclusive of caregivers. These insights strengthen the case that design standards must be both technically robust and attuned to the lived realities of older users.

The path forward: Guidelines and standards for AgeTech design

Whether designed for clinical integration or consumer use, AgeTech products should adhere to consistent and transparent expectations for privacy, safety, and ethical data practices. Establishing these foundations is a prerequisite for achieving scalability, user confidence, and system readiness. To support this, the paper outlines foundational domains and considerations to guide the development of design and evaluation standards for AgeTech.

First, all AgeTech should comply with relevant privacy legislation, including PIPEDA, HIPAA, and GDPR, regardless of whether a technology is formally classified as a medical device. Second, national guidelines should be established to mitigate algorithmic bias and ageism in AI-powered tools (Chu et al., 2022), helping to ensure that technologies serve all older adults equitably. Drawing on Stamate et al. (2024), we recommend that all AgeTech guidelines, including the above-mentioned AI guidelines, should act as dynamic tools, supporting continuous collaboration with older adults and caregivers. This includes iterative usability testing, adjusting algorithmic outputs based on real-world use, and ensuring that diverse groups, such as rural or low-income older adults, are actively involved in design decisions. Third, best practices for engaging older adults and caregivers in co-design processes should be formally established to ensure products align with lived experience, user needs, preferences, and values (Sumner et al., 2021). To fully realize the benefits of co-production, engagement must move beyond tokenistic consultation toward genuine co-leadership which centers older adults as collaborators in setting priorities, shaping innovations and defining ethical standards (Bryanton et al, 2023). Finally, international models and best practices, such as Europe's Ambient Assisted Living (AAL) program and Germany's digital validation body- Digitale Gesundheitsanwendungen- should be leveraged to inform national standards, promoting consistent, equitable, and user-centered approaches across the AgeTech ecosystem (Milella et al., 2021). Recent initiatives such as the IEEE Standards Association's AgeTech Group further emphasize this need. The group seeks to develop technology standards specifically designed for aging populations, recognizing that many products are not created with end-user needs in mind (IEEE Standards Association, 2024). Their work highlights growing international recognition that consistent, user-centered design principles are essential to ensuring equity, usability, and safety in AgeTech innovation.

For Canadian innovators and developers these standards should be transparent, easily accessible, and housed in a centralized repository that all AgeTech designers can consult. Furthermore, it would be beneficial to develop a decision-support tool to guide designers in identifying the appropriate regulatory pathways and guidelines that apply to their specific products, ensuring compliance and alignment with best practices from the earliest stages of development.

Collectively, these foundational design and development principles form the "Guidelines and Standards for AgeTech Development" pillar of the Trust Framework, providing a clear set of expectations that facilitate trust by providing structures that embed integrity into design processes. By ensuring that AgeTech products are safe, trustworthy, and aligned with widely accepted guidelines and standards, this pillar helps users feel secure in the technologies they adopt, while also establishing a shared baseline for developers, regulators, and other stakeholders to align practices and expectations.

Challenge 2: Uncertainty in evaluating AgeTech performance and value

Currently, there is no coordinated national mechanism responsible for independently verifying the claims made by AgeTech companies. This gap affects the entire AgeTech ecosystem, both clinical technologies aiming to integrate into the health and social care systems and non-clinical technologies marketed directly to older adults and caregivers. Without consistent, evidence-informed standards to evaluate claims

about performance, quality, safety, efficacy, cost-effectiveness, or social impact, decision-makers-whether in government, healthcare organizations, or households-face significant uncertainty (Stamate et al., 2024). This lack of standardized evaluation makes it difficult to compare technologies, assess their true value, and make informed adoption or procurement decisions (MacNeil et al., 2019). As a result, the AgeTech sector risks inefficiencies, duplication of effort (MacNeil et al 2019; Patterson & Roddick, 2025) and potential harm to end users (Wyonch, 2025) while health and social care systems and consumers alike are left navigating claims that may be overstated, unsubstantiated, or not relevant to real-world conditions. Importantly, without mechanisms that allow users to perceive both the competence of the technology- i.e., that it works reliably- and its benevolence- i.e., that it serves their best interests- trust cannot be established, creating persistent barriers to adoption, as emphasized by Mayer et al (1995).

The path forward: Supporting evidence-based and transparent evaluation of AgeTech impact

There is a growing need for a standardized and transparent impact framework to support responsible decision-making across the AgeTech ecosystem. This framework should first include rigorous metrics to assess whether technologies perform as intended for their target users, evaluating functionality, usability, safety, and accessibility in real-world conditions. Additionally, this framework should articulate clear "pathways to impact," establish reasonable expectations for contribution to healthy aging, ensure independent verification of vendor claims across both regulated and unregulated markets, and provide a common set of indicators spanning clinical, economic, functional, and social domains, tailored to different AgeTech contexts.

In practice, this would enable more informed procurement decisions within health and social systems, empower consumers to make evidence-based choices, reduce unnecessary duplication of pilot studies, and set standards for context-sensitive, real-world evaluation (Fraser et al., 2024). It would also align with international guidance, including the WHO Decade of Healthy Aging, which emphasizes transparent evaluation mechanisms, evidence-based design, and system-level accountability.

By promoting the transferability of validated solutions across jurisdictions, the framework would reduce fragmentation, enhance scalability, and set clear expectations for how technologies should demonstrate value—whether judged primarily on safety and cost-effectiveness in clinical contexts, or on usability, accessibility, and contribution to healthy aging in consumer markets. Crucially, evaluations must be benchmarked against current practice, rather than idealized "best practice care," particularly in regions facing workforce shortages, ensuring that AgeTech impact is measured in the conditions in which it will actually be deployed.

Collectively, these activities and recommendations form Pillar Two of the Trust Framework: Evidence-Based Impact and Accountability. Establishing a Canadian AgeTech Evaluation Framework would provide a structure for demonstrating both technology performance and alignment with users' goals. It would enable decision-makers across health and social care systems and consumer markets to assess the competence of the technologies using consistent, evidence-informed criteria, fostering accountability, transparency, and trust in the sector. Through this approach, both clinical and consumer technologies are held to clear standards of performance and meaningful impact, supporting responsible adoption, scaling, and integration across diverse environments.

Challenge 3: Barriers in scaling and spreading AgeTech

Despite rapid innovation, many promising AgeTech solutions are not reaching the people who need them most. Technologies often remain confined to pilot phases or limited markets, limiting their broader impact on autonomy, safety, and well-being. While some AgeTech products-particularly those intended for clinical use within the health system-require health technology assessment (HTA), many others, such as wellness tools and social technologies fall outside established evaluation frameworks altogether (Patterson & Roddick, 2025).

For medical technologies that do require formal HTA, the absence of a coordinated national process creates inefficiencies (Patterson & Roddick, 2025). Unlike pharmaceuticals reviewed through a single federal process, non-drug technologies face multiple, unaligned provincial reviews, creating duplication and delays (Stafinski et al., 2019; Patterson & Roddick, 2025). Even when technologies meet regulatory requirements, structural and operational factors limit adoption. The absence of national frameworks or assessment tools to assess organizational readiness, inconsistent guidance on alignment with health system priorities, and lack of structured implementation pathways result in prolonged pilots and fragmented deployment (Milella et al., 2021; Wyonch., 2025). Funding gaps between pilot programs and system-wide integration further constrain the ability of companies to iterate and optimize technologies based on user feedback (Genge et al., 2023).

Beyond HTA processes, the absence of cybersecurity and interoperability standards further limits its scale and spread (Aldosani, 2025; US Food and Drug Administration, 2025). Medical technologies handle sensitive health data yet apply cybersecurity standards inconsistently. Defining minimum cybersecurity and interoperability requirements would streamline integration and reduce risk. Furthermore, data governance and ownership concerns pose challenges as smart devices produce vast data streams. Establishing clear protocols for filtering and routing actionable insights can prevent clinician overload and support seamless workflow integration.

The challenge is compounded by structural barriers identified by the Canadian Medical Association's digital health interoperability task force (CMA, 2024), including fragmented record systems, inconsistent data sharing, limited clinician training, duplicative data tasks, and poor patient data access. Cultural and systemic factors, such as the need for Indigenous data sovereignty, further complicate adoption. Together, these issues create a landscape in which even well-designed, effective AgeTech solutions may fail to reach the patients and providers who need them most.

For products outside HTA pathways, such as wellness technologies, innovators face additional challenges, including limited access to public funding and structured evaluation mechanisms. Current funding models do not support iterative development, limiting refinement based on user feedback (Desveaux et al., 2017). Without standardized criteria or clear pathways, many AgeTech companies adopt direct-to-consumer models, a strategy that generates revenue but restricts access to those who can pay, exacerbating the digital divide and reinforcing existing disparities in technology access (Fang et al., 2019; Freeman et al., 2022).

Beyond issues of access and evaluation, wellness AgeTech faces additional barriers related to technology design, trust, and usability. Older adults may resist technologies which are perceived to threaten self-identity and evoke feelings of dependence (Astell, McGrath, & Dove, 2020). Stamate et al. (2024) emphasize that user-centered design is essential, yet verification of user-fit remains limited. Without such verification, consumers cannot reliably judge the competence or benevolence of a product, limiting adoption even for well-designed solutions. This is compounded by privacy and security concerns, particularly for devices that collect sensitive health or behavioral data. Without clear mechanisms for identifying products that align with user values and preferences, technology adopters are left to navigate significant uncertainty regarding safety, efficacy, and value (Paquette et al., 2024; Vitak & Shilton, 2020; AgeTech Collaborative, 2024).

Across both the health system and consumer markets, the broader potential of AgeTech to improve care, autonomy, safety, and well-being remains constrained by fragmented systems and inequitable access (Stamate et al, 2024; Patterson & Roddick, 2025).

The path forward: Supporting spread and scale of AgeTech within health and social care systems

Many promising AgeTech solutions remain trapped in pilot phases due to the lack of clearly defined implementation pathways. While many technologies are successfully tested, they face barriers in scaling due to the absence of consistent evaluation frameworks, heterogeneous HTA processes (Patterson and Roddick, 2025), and funding models that do not support innovation integration (Waynoch, 2025). To move beyond pilot projects health systems require tools and supports that address readiness, alignment, and implementation. Developing national tools would help organizations assess preparedness, select technologies suited to population needs, and implement them with minimal disruption (Milella et al., 2021).

Bridging the funding gap between pilot and system-wide integration will enable iterative refinement based on user feedback, supporting technologies that evolve in response to contextual needs and real-world performance (Desveaux et al., 2017; Genge et al., 2023). Together, these elements establish a foundation for evidence-informed, equitable, scale and spread.

Consistent national cybersecurity, interoperability, and data-privacy standards are also prerequisites for scale. Their absence fuels institutional risk aversion and slows adoption (Aldosani, 2025; US FDA, 2025).

Establishing a national AgeTech Cybersecurity and Interoperability Certification, modeled after frameworks such as ISO 27001 and FHIR, could help address these gaps by setting consistent expectations for safety and connectivity. Such a certification would give organizations and providers confidence that a product meets baseline requirements before integration, reducing redundant assessments and lowering institutional risk. Beyond compliance, a shared certification mechanism would signal competence and accountability in how technologies are developed and deployed, contributing to a more trustworthy innovation ecosystem.

In tandem, clearly defined evaluation criteria for AgeTech- as defined in Pillar 2- are essential for guiding scale and spread decisions. When organizations can see transparent thresholds for safety, performance, and demonstrated benefit, they are better equipped to make informed decisions about adoption and investment. This clarity not only supports more efficient integration but also ensures that pathways for public funding and procurement reflect technologies that have met meaningful impact and readiness standards. By articulating these benchmarks in advance, systems can move toward a more predictable and equitable process for supporting technologies that deliver tangible improvements in care and well-being.

To ensure that technologies enhance rather than overwhelm clinical workflows, a standardized hierarchy for data should also be established. This would help structure the flow of information generated by AgeTech into categories of actionable medical data (e.g., fall alerts), clinical decision support (e.g., gait pattern trends and analysis), and contextual data (e.g., step counts). Such structuring promotes transparency in how insights are surfaced, ensuring that clinicians receive timely, relevant information while avoiding overload or distraction from less critical data streams. Addressing this governance challenge is key to realizing the benevolent intent of AgeTech, to augment, rather than complicate or functionally replace, the work of care providers (Genge et al, 2023).

Finally, aligning with principles of transparency and accountability, the development of standardized health economic assessment tools is needed to evaluate the financial, operational, and workforce implications of AgeTech deployment (Desveaux et al., 2017;Xie et al., 2011). By embedding these tools within a shared evaluative framework, health systems can make more consistent, evidence-informed decisions about which technologies warrant further scale or support.

Together, these regulatory supports—cybersecurity certification, clear evaluative benchmarks, structured data hierarchies, and economic assessment tools—create the foundations necessary for Pillar Three: Pathways for Scale and Spread. They advance not only the technical capacity for integration but also the broader trustworthiness of the system by ensuring that decisions are transparent, evidence-based, and aligned with health system needs.

The path forward: Advancing trust and transparency in consumer AgeTech

Advancing consumer adoption of AgeTech will require both trust and empowerment, ensuring that older adults and their care partners feel confident in the technologies they select. Rigorous design standards (Pillar 1) and evidence-informed evaluation frameworks (Pillar 2) form the essential prerequisites for creation of effective decision support tools. These underpinning pillars ensure that products meet high standards of integrity through verified design and competence through validated performance. By embedding these mechanisms into the consumer-facing ecosystem, older adults and their care partners can make choices with confidence, knowing that technologies are likely to perform as intended and deliver meaningful benefit—reflecting benevolence by aligning solutions with real user needs.

Several measures can operationalize this approach. Companies should have access to a clear verification process that confirms compliance with established design and performance standards, helping consumers identify trusted wellness technologies that meet design standards and align to their values. Evidence from other industries shows that voluntary certification and labelling programs influence consumer behaviour (Deconick & Hokeika, 2023) and enable consumers to align their purchases to their values (Iweala et a., 2022; Gorton et al., 2021; McLeod et al., 2023). Responsibility for administering this verification should be clearly defined, whether through a national body, regulatory agency, or independent certifying organization, to ensure consistency and credibility. As part of this process, decision support tools could be developed to empower older adults and their care partners to select technologies that align with their individual needs, preferences, and available resources. For example, an interactive online platform could allow users to input details- such as digital literacy, personal goals, privacy preferences, and/ or budget constraints- and receive a ranked list of verified AgeTech solutions tailored to their circumstances. By linking verified design and performance data to these tools, consumers can make informed choices with confidence, knowing that the technologies they adopt are safe, effective, and well-suited to their circumstances. These verification processes would also provide protections against misleading marketing claims (Arguedas, 2021) and the adoption of products that do not meet design standards (Ladeia & Pereira, 2024), ensuring that only solutions meeting rigorous standards are recommended.

Additionally, introducing a Canadian AgeTech Consumer Label—similar to Energy Star for electronics—would provide consumers with a clear, recognizable signal of validated AgeTech solutions. Such a label could verify privacy and

security compliance and score products on user-centered design, accessibility, and affordability. This certification process would not only empower consumers to make informed choices but also provide a competitive advantage for Canadian AgeTech companies, differentiating them from global competitors and supporting market leadership in innovative, validated solutions.

Collectively, these measures form Pillar Four of the Trust Framework: Informed Consumer Access and Empowerment. By implementing clear verification processes, a consumer-focused certification label, and protections against misleading claims, this pillar addresses key barriers to scale and spread identified above—ensuring that older adults and their care partners can confidently adopt technologies that are safe, effective, and aligned with their needs. At the same time, these mechanisms provide Canadian companies with a pathway to demonstrate credibility, differentiate their products, and compete effectively in domestic and international markets. In doing so, Pillar Four promotes transparency, trust, and equitable access, helping AgeTech solutions reach the people and settings that stand to benefit most.

Discussion: The Trust Framework

The four pillars of the Trust Framework provide an integrated governance roadmap to strengthen the Canadian AgeTech ecosystem. Rather than serving as isolated mechanisms, each pillar is functionally dependent on the others to create a system of guidance and accountability that facilitates implementation, supports adoption, and enables integration across settings. Together, they ensure that technologies are designed, deployed, and evaluated in ways that are trustworthy, effective, and responsive to the lived experiences of older adults and caregivers. Embedding considerations of equity and justice across this integrated framework ensures that technologies are accessible for users with a broad range of socioeconomic status, geographic location, cultural background, or functional ability.

These validated outcomes then shape Pillar Three, which addresses pathways for scale and spread, providing harmonized implementation frameworks, change-management tools, and system-level strategies to move innovations from localized pilots to widespread adoption. Embedding equity here means ensuring that technologies are scaled in ways that reach underserved communities and reduce barriers to access. Finally, this systemic readiness enables Pillar Four, which empowers consumers by offering accessible verification tools, certification labels, and decision-support mechanisms. Equity in this context requires that all older adults, including those with limited technological literacy or resources, have meaningful opportunities to access and use trusted information when making AgeTech decisions. Crucially, the real-world deployment challenges discovered in public procurement and consumer adoption continuously inform iterative refinement of design standards and evaluation metrics, ensuring frameworks adapt to evolving sector realities. Grounded in Socio-Technical Systems theory, this integrated structure offers a model where ethics and operations serve as mutually reinforcing requirements to cultivate systemic trust. The unique utility of these governance mechanisms is their capacity to simultaneously advance ethical imperatives, such as equity, dignity, and digital inclusion, alongside operational necessities, such as technical interoperability, data security, and market scalability. The framework operationalizes the principles of trust building as articulated earlier-transparency, beneficence, and accountability-to establish a comprehensive foundation for ethical, scalable AgeTech. Establishing a clear and consistent baseline provides a predictable foundation that aligns developers, healthcare systems, and consumers around shared expectations. This proactive approach centers trust, designed directly into the technology lifecycle from day one, accelerating the translation of innovative concepts into secure, impactful, and widely scalable solutions.

Operationalizing this integrated structure requires navigating perceived tensions between regulatory structure and innovation velocity. By analyzing how these tensions manifest across the framework, it becomes possible to explore how systemic investments in governance frameworks might offer long-term structural advantages.

First, the design criteria of Pillar One aim to unify technical standards with ethical design, which can introduce an apparent friction regarding development timelines and upfront costs. Requiring innovators to address privacy, interoperability, and equity considerations from the beginning may requirea higher baseline investment of time and early-stage capital. However, this structure is intended to provide greater predictability. By establishing transparent benchmarks early in the engineering lifecycle, the framework can help developers reduce the risk of executing multiple, costly custom rebuilds to meet fragmented consumer preferences or varying provincial regulations. This upfront clarity is designed to lower downstream market entry barriers and protect capital investments, while supporting the development of products that are more equitably usable from their initial iteration.

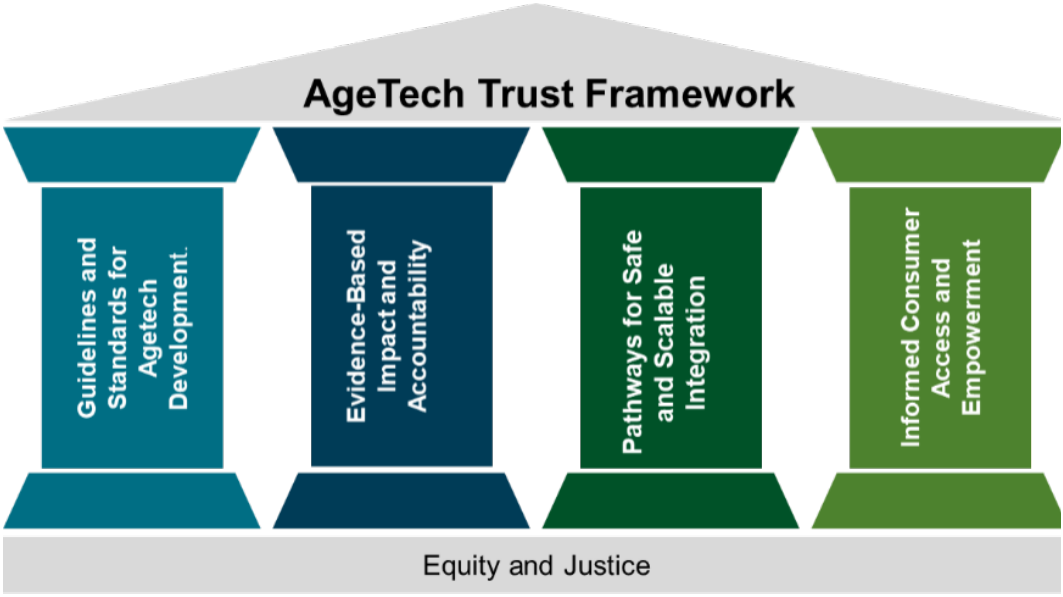


Figure 1. The cohesive logic of the framework relies on these pillars operating as a dynamic, iterative feedback loop rather than a rigid linear sequence. Within this iterative ecosystem, Pillar One establishes rigorous, transparent, and ethical standards for design and development, ensuring privacy, cybersecurity, interoperability, and responsible AI use. Equity considerations here require that design processes actively engage diverse older adult populations and caregivers to ensure products meet a range of needs and preferences from the outset. This foundational work informs Pillar Two, which provides mechanisms for independent verification, evidence-based evaluation of safety, efficacy, cost effectiveness, and social impact, alongside transparent reporting. Equity and justice in this phase require evaluation frameworks and metrics that assess differential impacts across populations and identify any unintended consequences that could disproportionately affect vulnerable groups.

Second, the standardized evaluation pathways of Pillar Two interface directly with the operational friction between rapid consumer market cycles and slower, more risk-averse health system procurement models. Navigating these disparate paces presents a clear challenge to rapid deployment, as establishing rigorous validation metrics for safety, efficacy, and social impact takes time. Yet, this systematic evaluation is precisely what helps mitigate risk within the commercial landscape. Generating synchronized, dual-impact evidence catalyzes a rare alignment between healthcare and commercial markets, shaping the pathways for safe and scalable integration of Pillar Three. It provides a distinct architectural advantage, aiming to establish the prerequisite data needed to pursue public commissioning at scale while simultaneously signaling verified competence and safety to direct-to-consumer markets. Finally, the consumer certification labels of Pillar Four present the logistical challenge of managing public communication and ensuring that verification tools remain accessible across highly diverse populations. If improperly executed, consumer labeling could add an unnecessary layer of bureaucratic complexity for older adults and their caregivers. However, when properly integrated, these labels translate consumer protection principles into practical mechanisms that support equitable access and informed decision-making. By clearly identifying safe, high-performing, and affordable technologies, the framework offers a tool to reduce informational asymmetry and financial risk for consumers. This trustworthy verification assists older adults and their caregivers in avoiding ineffective or unvetted devices, supporting a more equitable and reliable distribution of digital innovation across populations.

Limitations and future work

The primary limitation of this Trust Framework is its deliberate focus within the Canadian policy, jurisdictional, and funding landscape. The framework is designed to specifically address the unique challenges within the Canadian context. Consequently, the practical operational levers proposed here, such as national consumer labeling initiatives or alignment with provincial procurement pathways, are context specific and cannot be seamlessly superimposed globally onto other health systems or markets.

However, while the operational levers are rooted in Canada, the underlying systemic lessons are highly transferable. This framework offers an opportunity for international peers to translate these integrated pillars into their own geopolitical and regulatory contexts. Exploring these intersections could eventually open doors to the possibility of an international standard for AgeTech or a shared, cross-jurisdictional evaluation framework. Such global alignment could harmonize evidence requirements, reduce market fragmentation for developers internationally, and accelerate access to safe technologies for older adults in diverse settings, representing a critical avenue for future comparative policy research.

Conclusion

The Trust Framework presented in this perspective piece is fundamentally aspirational. Moving this model from a conceptual framework into operational reality will require immense multi-sectoral collaboration, political will, and sustained collective action to navigate the distinct hurdles of building a unified governance model across a fragmented Canadian federation. Overcoming these deep-seated structural barriers requires that older adults, caregivers, provincial health authorities, federal regulators, and industry developers actively convene as partners in a structured, national consensus-building processes to define and operationalize the principles of trust.

Within this collaborative process, several potential actionable priorities emerge to help translate the framework into functional realities. These include establishing mandatory standards for privacy, cybersecurity, interoperability, and the ethical use of AI, as well as developing best practice guidelines for the design and accessibility of AgeTech. Furthermore, effort could be directed toward creating complexity-informed system-level assessment tools to support evaluation, launching trusted consumer certification and labeling programs, and creating decision support tools to help older adults and caregivers identify technologies that suit individual circumstances.

Grounding these coordinated activities in the four pillars, and centering equity and justice across each, will strengthen Canada's AgeTech ecosystem and accelerate the translation of innovation into impact. This approach will ensure technologies deliver measurable benefits for older adults and caregivers, improve system efficiencies, and foster equitable, sustainable adoption across communities. Ultimately, this is a call to action for the co-creation of governance frameworks rooted in implementation science, designed to translate innovation into safe, scalable, and equitable solutions. Embedding these principles will position Canada as a global leader in advancing trustworthy, evidence-informed, and socially responsible AgeTech.

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