European Journal of Innovation Management

419

Received 11 March 2025
Revised 9 July 2025
Accepted 8 September 2025

The role of accelerators in enhancing the performance of born-digital healthcare platforms

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Abstract

Purpose – This study examines the role of accelerators in the performance of born-digital health platform startups. Specifically, we investigate whether accelerators, including both domain-specific and general types, provide measurable performance gains in a complex, regulated and prone to rapid change healthcare environment.

Design/methodology/approach – Drawing on data from 235 born-digital health platform startups funded between 2010 and 2021, we use a two-step methodology. First, we evaluate performance with the benefit of the doubt composite indicator method. Second, we assess accelerator impact through a quasi-experimental approach employing propensity score matching to examine differences between domain-specific and general accelerator impacts.

Findings – Contrary to prevailing assumptions, our analysis indicates that non-accelerated startups tend to outperform those that have engaged in accelerator programs. Moreover, domain-specific accelerators do not offer a significant advantage over general ones. These results suggest that startup performance may be more closely linked to inherent capabilities and sector-specific challenges, such as regulatory complexity, rather than to external support from accelerators.

Originality/value – This paper addresses a critical research gap by differentiating the effects of various accelerator types in the digital health sector. The findings challenge traditional views on accelerator effectiveness and offer new insights that can inform more targeted support strategies in healthcare entrepreneurship.

Keywords Accelerators, Born-digital startups, Composite performance indicators, Health platforms, Propensity score matching

Paper type Research article

Plain English summary

Do accelerators really help healthcare platforms? In recent years, many startups have focused on digital health platforms, driven by entrepreneurs wanting to improve patient care and cut healthcare costs using digital tools. While accelerators are often used to help these startups grow, their effectiveness has been unclear. Our study examined 235 digital health startups and found that those without accelerator support performed better than those with it. Additionally, there was no noticeable benefit for startups in health-specific accelerators compared to general ones. This research offers new insights into the complex role of accelerators in the digital health sector. Policymakers should re-evaluate the support and funding structures for health

JEL Classification — C610, M130

Funding: This research has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 952012, and the Catalan Government's Economy and Knowledge Department under grant 2021-SGR-00719 "Entrepreneurship, Management and Performance".

Conflict of interest: The authors declare no competing interests that are relevant to the content of this article.

European Journal of Innovation Management
Vol. 28 No. 11, 2025
pp. 419-443
Emerald Publishing Limited
e-ISSN: 1758-7115
p-ISSN: 1460-1060
DOI 10.1108/EJIM-03-2025-0282

startup accelerators. Instead of broadly promoting accelerator programs, a more tailored approach that considers the specific needs and contexts of digital health startups may be more effective in fostering innovation and success in the healthcare sector.

1. Introduction

The digital health sector is reshaping traditional healthcare delivery by integrating advanced technologies such as artificial intelligence, telemedicine, and data analytics. Digital health technologies are proposed to improve the efficiency and effectiveness of healthcare delivery through innovations such as personalized care and real-time monitoring; however, empirical evidence supporting these claims remains limited, with only a small fraction of solutions undergoing rigorous validation (Mathews *et al.*, 2019). Digital health startups are central to this transformation, leveraging platform-based business models to introduce groundbreaking solutions (Austin *et al.*, 2021; Lalit *et al.*, 2024). Although they have significant potential, healthcare platform startups that are born-digital are established with digital value chains and limited resources, and they face significant challenges in achieving sustainable performance (Blank and Dorf, 2012; Pundziene *et al.*, 2023; Unterkalmsteiner *et al.*, 2016). Their failure rate is alarmingly high, with nearly 98% ceasing operations within five years (Baum *et al.*, 2000; Chakraborty *et al.*, 2021; Choi *et al.*, 2023).

Healthcare startups operate in a distinct environment characterized by stringent regulatory demands, interdisciplinary complexities, and ethical considerations. Advancements in healthcare, unlike other industries, carry profound implications for human life and well-being (Kulkov, 2023). Startups must comply with rigorous approval processes led by authorities such as the Food and Drug Administration (FDA) or the European Medicines Agency (EMA), often requiring extensive clinical trials and data validation (Jahn and Bohnet-Joschko, 2024; Scott *et al.*, 2023). Moreover, they must navigate intricate stakeholder relationships and safeguard patient data to maintain trust and avoid legal repercussions (Fuerstenau *et al.*, 2021; Schiavone *et al.*, 2021; Gleiss and Lewandowski, 2022). These challenges require diverse expertise, and have higher entry barriers and demand greater resource investments than other sectors (Jahn and Bohnet-Joschko, 2024).

To address these obstacles, accelerators have emerged as key support mechanisms, offering mentorship, funding, and networking opportunities through structured programs (Hochberg, 2016; Hallen *et al.*, 2020). While accelerators have demonstrated success in fostering growth in other industries (Uhm *et al.*, 2018; González-Uribe and Leatherbee, 2018; Pauwels *et al.*, 2016), their effectiveness in healthcare remains ambiguous. Scholars have raised concerns about whether accelerators adequately address the industry's regulatory and interdisciplinary demands (Hochberg, 2016; Yu, 2020). Furthermore, the limited research on domain-specific accelerators highlights the need for deeper exploration of their role in supporting healthcare startups (Chan *et al.*, 2020; Essén *et al.*, 2023; Shankar and Clausen, 2020).

This study applies dynamic capabilities theory to assess whether accelerators enhance the performance of born-digital health platform startups. This framework illustrates how companies build dynamic capabilities—specifically the capabilities to sense, seize, and transform opportunities—in order to adapt to change and secure competitive advantages (Teece *et al.*, 1997). In theory, accelerators bolster these capabilities by offering resources, mentorship, and networks, supporting startups in addressing the complex challenges of healthcare. This assumption forms the basis for our first hypothesis. Additionally, the study uses innovation diffusion theory to explore whether domain-specific accelerators outperform general ones. This theory, rooted in Rogers' (1962) principles of diffusion, emphasizes how domain expertise and networks facilitate innovation adoption and implementation. By addressing the unique regulatory, clinical, and interdisciplinary demands of the healthcare sector, domain-specific accelerators may better support startups.

The motivation for exploring the role of accelerators in the performance of born-digital healthcare startups is multifaceted. Healthcare startups play a vital role in addressing critical societal challenges, including those posed by an aging population, rising healthcare costs, and the need for advances in prevention, diagnostics, and treatment (Xie and Lawley, 2015). These issues were further amplified by the COVID-19 pandemic, which underscored systemic inequities, professional burnout, and demand for decentralized and personalized care. In parallel, the healthcare sector has emerged as a key driver of global innovation and knowledge flows (Giglio *et al.*, 2023). Following the pandemic, health-tech startups surged, offering innovative solutions for underserved markets (Chakraborty *et al.*, 2023). Despite their growing relevance, research on their business dynamics and regulatory navigation remains limited (Chakraborty *et al.*, 2021). These startups confront complex barriers—including clinical validation and high capital requirements—that demand deeper academic inquiry (Sreenivasan and Suresh, 2022; Beaulieu and Lehoux, 2019).

Accelerators are widely believed to help startups overcome such obstacles by offering mentorship, funding, and access to critical networks (Shankar and Clausen, 2020). This is especially relevant for born-digital ventures, which, while inherently agile (Pundziene *et al.*, 2023), face challenges related to continuous innovation, network effects, and multisided business models (Grama-Vigouroux *et al.*, 2020; Nambisan *et al.*, 2019). Understanding how accelerators support these ventures is essential in designing effective interventions (Battistoni *et al.*, 2016). Finally, studying accelerators in this context offers insight into their broader ecosystem role. Accelerators contribute to job creation, technological development, and institutional bridging (Chakraborty *et al.*, 2021; Pauwels *et al.*, 2016), and facilitate innovation diffusion through investor and stakeholder engagement (Chakraborty *et al.*, 2023). These insights can inform policies aimed at enhancing the sustainability and impact of healthcare startups.

This study seeks to address the following research question: How do accelerators influence the performance of born-digital health platform startups? Employing a two-step methodology, the research first evaluates startup performance through a composite indicator using the benefit of the doubt composite indicator method (Cherchye *et al.*, 2007). It then assesses the impact of accelerator participation through a quasi-experimental approach using propensity score matching (Serra, 2012). The sample comprises 235 born-digital health platform startups funded between 2010 and 2021. The findings indicate that non-accelerated startups perform better than their accelerated counterparts, challenging the assumption that accelerators consistently enhance performance. Moreover, domain-specific accelerators show no significant advantage over general ones. These results suggest a need to rethink accelerator programs in the healthcare sector so as to better align them with its unique demands (Frimodig and Torkkeli, 2017; Hallen *et al.*, 2020; Regmi *et al.*, 2015).

The remainder of this paper is organized as follows. Section 2 provides a review of the literature on born-digital health platform startups and accelerators. Section 3 describes the methodology, and section 4 presents the sample, data and variables. Section 5 reports and discusses the results. Finally, Section 7 concludes with implications for theory, practice, and policy, and Section 8 identifies limitations and suggests directions for future research.

2. Literature review, theoretical framework and hypothesis

This literature review section focuses on the following key areas: born-digital health platform startups and their performance, the role of accelerators in these startups' performance, and the particular impact of domain-specific accelerators. We establish our theoretical framework by drawing on dynamic capabilities theory and innovation diffusion theory, which together provide a solid foundation for understanding how accelerators influence the performance of born-digital health platform startups. These theoretical perspectives also guide the development of our hypotheses, further strengthening the analytical framework of the study.

2.1 Born-digital health platform startups and their performance

The healthcare industry has undergone significant transformation with the rise of digital health startups, which develop and leverage emerging technologies to address critical challenges in healthcare delivery. These startups, like other technology-based ventures, are characterized by their nascent stage, small size, and a strong focus on scaling technology and business models in highly uncertain environments (Bertoni *et al.*, 2015; Unterkalmsteiner *et al.*, 2016). By offering innovative solutions such as digital therapeutics, remote patient monitoring, and health data analytics, digital health startups have the potential to enhance patient care and operational efficiency in healthcare systems (Hird *et al.*, 2016; Wang *et al.*, 2023).

The rapid growth of born-digital startups, including those in the health sector, is largely driven by increased technology adoption and the strategic use of digital capabilities to enhance business performance (Bi *et al.*, 2017; Ruokolainen *et al.*, 2023). These startups operate at the intersection of healthcare and technology, leveraging their agility and innovation-focused approaches to introduce digital solutions that optimize traditional healthcare delivery models. Scholars have highlighted how digital transformation in healthcare, including pharmaceutical advancements, has enhanced patient engagement and introduced novel ways to monitor health through digital applications (Hird *et al.*, 2016). However, their contributions to healthcare innovation are heavily influenced by regulatory frameworks, data security requirements, and stakeholder trust, which vary significantly across regions (Zajicek and Meyers, 2018; Chakraborty *et al.*, 2021; Kulkov *et al.*, 2020).

Digital health startups face considerable challenges, including complex environments, securing patient data, and navigating fragmented payment and reimbursement systems (Vannieuwenborg *et al.*, 2017). Strict medical regulations represent a prominent example: as of late 2022, the U.S. FDA had approved 521 AI-driven medical devices, reflecting the rigorous approval pipeline for digital health innovations (Landers *et al.*, 2023). Startups developing software classified as medical devices or employing AI-driven diagnostics must navigate demanding regulatory benchmarks (e.g. FDA's 510(k) clearance or Software as Medical Device guidelines), significantly delaying their time-to-market and complicating early-stage growth. These challenges are exacerbated by uncertainty in the startup ecosystem, which demands iterative experimentation with business models to validate assumptions and refine value propositions (Unterkalmsteiner *et al.*, 2016; Muhos *et al.*, 2019). This approach is crucial for fostering innovation and enabling startups to adapt to volatile healthcare markets (Wang *et al.*, 2022). Additionally, born-digital health platforms encounter unique difficulties that differentiate them from other technology-driven businesses. These include developing scalable business models while complying with healthcare regulations, gaining acceptance from healthcare providers, and meeting clinical validation standards (Zajicek and Meyers, 2018). Despite these obstacles, they have the potential to reduce costs, empower patients, and enhance healthcare delivery (Al-Emran *et al.*, 2022). Success relies on aligning with stakeholder priorities, maintaining operational agility, and building trust within healthcare systems (Chakraborty *et al.*, 2021).

A recurring theme in the literature is the need for these startups to operate within a policy and regulatory environment that is conducive to achieving sustainable growth. While they are well-positioned to transform healthcare delivery, the challenges of navigating the healthcare ecosystem highlight the need for robust frameworks to measure their performance and understand the mechanisms that drive their impact (Essén *et al.*, 2023). As startups continue to experiment with innovative models, capturing and evaluating their performance remains critical for advancing knowledge and practice in digital health (Hatef *et al.*, 2018).

The performance of startups has long been a major area of interest in managerial scientific literature (Brush and Vanderwerf, 1992; Chandler and Hanks, 1993; Choi *et al.*, 2023; Kaiser and Kuhn, 2020). This interest stems from the need to understand the factors contributing to the success or failure of startups and to identify mechanisms that support their long-term growth and stability. For born-digital health platform startups, this focus is especially relevant due to the unique challenges and opportunities posed by the healthcare sector.

The existing literature on startup performance highlights several key themes. Acquiring the necessary resources to sustain growth remains one of the primary challenges for startups (Uhm *et al.*, 2018). Born-digital health platforms often rely heavily on external sources such as accelerators and venture capital to secure funding and expertise (Hechavarría *et al.*, 2016). In addition to financial support, accelerators offer networking opportunities, mentorship, and access to industry-specific resources, all of which are critical in helping startups navigate the uncertain and highly regulated healthcare environment. The healthcare sector's complexity adds another layer of difficulty for these startups. As a relatively non-platformed industry, healthcare demands innovative business models and extensive market research to align with the needs of patients, providers, and regulators (Essén *et al.*, 2023; Pundziene and Geryba, 2024). Unlike startups in less-regulated industries, born-digital health platforms face significant barriers, including compliance with healthcare standards, securing sensitive patient data, and establishing trust with stakeholders. These factors underscore the importance of examining the role of accelerators in mitigating these challenges and fostering startup success.

2.2 The role of accelerators in born-digital health platform startups' performance

Accelerator programs, typically structured as fixed-term, cohort-based initiatives that offer seed funding, mentorship, and access to entrepreneurial networks, have become key components of modern startup ecosystems (Polo Garcia-Ochoa *et al.*, 2020). For born-digital health platform startups, accelerators are often viewed as a strategic entry point for accessing critical resources and gaining legitimacy within the complex and highly regulated healthcare sector. However, the literature examining the role of accelerators in startups performance has undergone significant development in recent years. Contemporary research on accelerators' impact has evolved in the past five years, revealing both supportive and critical perspectives.

The impact of accelerators on startup performance is a crucial area of inquiry, as these programs not only provide resources but also shape how startups refine their business models. Recent studies emphasize the need for business model alignment with the surrounding ecosystem (Kapoor and Teece, 2021), particularly in how technologies integrate into these ecosystems to create value. While traditional performance metrics like financial outcomes and market share remain relevant, the unique nature of born-digital health platforms calls for a broader perspective (Chakraborty *et al.*, 2023). Factors such as user engagement, quality of service delivery, and adherence to healthcare standards are equally critical. In this context, accelerators enhance startup performance by providing targeted support in these areas, thereby increasing the likelihood of long-term success. This section explores how accelerators influence startup performance and how they help born-digital health platforms overcome sector-specific challenges.

In Teece's *et al.* (1997) seminal formulation, firms need three interrelated capabilities: the capacity to sense and shape opportunities and threats, seize opportunities, and transform (reconfigure) assets to maintain competitiveness. Defined as the ability to integrate, build, and reconfigure competencies to respond to shifting conditions, dynamic capabilities are essential for born-digital healthcare platform startups operating in highly regulated industries with complex stakeholder networks and heightened concerns about patient safety and data privacy (Chakraborty *et al.*, 2023; Teece, 2007). To navigate these challenges successfully, start-ups must develop three core dimensions of dynamic capabilities: (1) identifying opportunities, such as identifying market needs and regulatory changes; (2) identifying opportunities, including building partnerships with healthcare providers and investors; and (3) transforming organizational resources, refining business models to align with the regulatory and operational demands of the healthcare industry (Teece *et al.*, 1997). We strengthen the theoretical grounding by explicitly linking accelerators to these dynamic capabilities. Accelerator programs can be viewed as "capability builders" and enablers that help start-ups develop these capabilities by offering mentorship, funding, and industry-specific knowledge, which foster startup development and adaptability (Cohen *et al.*, 2019; Hallen *et al.*, 2020; Hochberg, 2016; Pauwels *et al.*, 2016).

Recent research supports this perspective: a qualitative analysis of Y Combinator's accelerator methodology showed that specific program actions (e.g. intensive mentorship, iterative product feedback) directly contribute to the generation of startups' dynamic capabilities (García-Ochoa *et al.*, 2022). By embedding routines of rapid learning and adaptation, accelerators may effectively "upgrade" a startup's sensing, seizing, and reconfiguring skills, which are essential for competitive advantage. This dynamic-capabilities view not only explains how accelerators can boost performance (by enhancing strategic agility), but also frames testable mechanisms for our study. The insertion of this theory-driven explanation addresses the need for stronger theoretical grounding.

Through structured programs, they connect startups to specialized networks that facilitate knowledge exchange and resource access (Bliemel *et al.*, 2019). Polo Garcia-Ochoa *et al.* (2020) reveal that certain accelerators practices indeed enhance startups' dynamic capabilities. Additionally, absorption, integration, and innovation capabilities are shown to have a positive influence on startups' performance. Recent research underscores that peer interactions and structured mentorship within accelerator programs significantly enhance incremental innovation performance, directly strengthening startups' dynamic capabilities (Del Sarto *et al.*, 2022). Specifically, engaging with mentors and peers during acceleration fosters richer knowledge exchange, thereby improving startups' capacities to identify and exploit innovation opportunities effectively (Del Sarto *et al.*, 2022). Such interaction-based learning environments help born-digital health startups continuously refine their product offerings, crucial for navigating rapidly evolving healthcare ecosystems characterized by stringent regulatory demands and complex stakeholder requirements.

In addition to strengthening dynamic capabilities, accelerators improve startups' absorptive capacity, the ability to acquire and apply external knowledge, through interactive mentoring and collaborative learning environments. Given the stringent regulatory challenges and evolving market conditions of health-tech startups (Chakraborty *et al.*, 2023), accelerators help them navigate institutional barriers by fostering mentorship and industry collaborations (Lim and Anderson, 2016). Beyond direct financial and knowledge-based support, accelerators also influence how startups engage with competitors through coopetition—a dynamic interplay of collaboration and competition (Moritz *et al.*, 2022). However, in highly regulated industries like healthcare, the complexity of data privacy regulations and proprietary technologies may create barriers to effective coopetition. In highly regulated industries such as healthcare, accelerators provide tailored guidance on compliance, stakeholder engagement, and capacity development (Brown *et al.*, 2019). However, their impact depends on how well their program structure aligns with industry-specific challenges.

While accelerators foster open innovation and cross-organizational collaboration—both essential for navigating complex and interconnected business environments (Battistella *et al.*, 2017)—their short-term focus and intense timelines can sometimes pressure startups to prioritize immediate scaling over long-term strategic alignment (Hallen *et al.*, 2020). This emphasis on rapid growth may lead founders to make decisions that optimize short-term gains while potentially overlooking broader strategic considerations (Cohen *et al.*, 2019). Furthermore, while accelerators provide valuable resources and mentorship, their effectiveness varies depending on how entrepreneurs engage with these programs (Cubukcu and Gulsecen, 2020). In highly regulated sectors, such as healthcare, these constraints may introduce additional risks if startups rush development without fully addressing compliance and quality assurance requirements (Polo Garcia-Ochoa *et al.*, 2020).

Integrating insights from recent literature, we recognize the dual nature of accelerator programs. On one hand, accelerator-provided mentorship and peer interactions significantly strengthen startups' dynamic capabilities by enhancing incremental innovation and enabling better exploitation of emerging opportunities (Del Sarto *et al.*, 2022). While they provide critical resources such as funding, regulatory support, and networking opportunities, they also introduce challenges such as equity dilution, strategic misalignment, and high-pressure timelines (Isabelle, 2013). In the healthcare sector, this trade-off is particularly pronounced, as the industry's stringent demands mean that even minor missteps can have significant consequences. Scholars note that while accelerators can drive rapid growth and performance improvement, their impact depends on program structure, market conditions, and the specific needs of participating startups (Drori and Wright, 2018; Hallen *et al.*, 2020). By equipping startups with resources and networks to navigate regulatory compliance, stakeholder engagement, and innovation, accelerators play a significant role in improving performance (Battistella *et al.*, 2017). However, their effectiveness ultimately depends on their alignment with a startup's long-term goals and the unique demands of the healthcare sector. This highlights the importance of tailoring accelerator programs to meet the specific needs of healthcare startups, ensuring their capacity to thrive in an inherently high-stakes industry.

Nevertheless, when an accelerator's offerings are well-aligned with a startup's needs – as is often the case for domain-specific programs in digital health – the theoretical and early empirical evidence leans positive. Effective alignment ensures the accelerator's contributions reinforce the startup's dynamic capabilities rather than distract from them (Silva *et al.*, 2022). For instance, health-focused accelerators with sector expertise can provide high-value mentorship and facilitate connections (e.g. to clinicians or regulators) that directly support responsible innovation, yielding outcomes on par with or better than those of general programs.

Summarizing, from a DCT perspective, accelerators function as capability-enhancing institutions. They do not merely offer resources; they help startups build the organizational routines and learning mechanisms needed to adapt over time. This theoretical framing leads us to posit that accelerators should positively influence the performance of born-digital healthcare startups by enabling them to navigate uncertainty, improve fit with regulatory and market environments, and refine their innovations in line with external demands. Therefore, even though there are valid critiques regarding the inconsistent effectiveness of accelerators, the balance of theoretical reasoning and empirical patterns across industries supports the expectation that accelerators contribute positively to startup performance. Particularly in dynamic and uncertain environments like digital health, accelerators offer access to external knowledge, mentorship, funding, and institutional legitimacy—critical resources for firms facing high regulatory and technological complexity. These benefits are theorized to enhance the firm's adaptive capacity and speed to market, both of which are essential for success in healthcare innovation. Therefore, despite some caveats, we hypothesize a net positive effect of accelerator participation on the performance of born-digital health platform startups.

H1. Accelerators have a positive impact on the performance of born-digital health platform startups.

2.3 Domain-specific accelerators and their impact on born-digital health platform startups

Stinchcombe's 1965 seminal work highlights how the foundational circumstances of a startup's establishment shape its future trajectory and performance (Stinchcombe, 2000). Building on this premise, innovation diffusion theory (IDT) (Rogers, 1962) provides a robust framework to analyze how accelerators—particularly domain-specific ones—impact the adoption, performance, and scalability of born-digital health platform startups. IDT holds that innovation adoption is influenced by factors such as relative advantage, compatibility, complexity, trialability, and observability, all of which are critical in the healthcare domain.

Born-digital health platform startups operate in a highly regulated and resource-intensive ecosystem characterized by stringent compliance requirements (e.g. the Health Insurance Portability and Accountability Act, FDA regulations, etc.) and a focus on patient safety and quality assurance (Iqbal and Biller-Andorno, 2022; Torous *et al.*, 2022). These regulatory complexities increase the perceived complexity of their innovations, often requiring startups to undergo a trial-and-error process to refine their business models and solutions (Essén *et al.*, 2023). Without adequate support, this complexity can hinder innovation adoption and scalability, as suggested by IDT. Domain-specific accelerators are uniquely positioned to provide tailored guidance to navigate such challenges (Cohen *et al.*, 2019; Crişan *et al.*, 2021).

Additionally, born-digital health platform startups require specialized knowledge in areas such as clinical data analytics, telehealth technologies, and patient-centered solutions (Coravos *et al.*, 2020). These specialized needs, combined with the high capital requirements of the healthcare industry, often exceed the standard financial and non-financial support offered by accelerators (Yu, 2020). While accelerators provide critical resources, their ability to meet these demands may vary significantly depending on their morphology—a concept that encompasses differences in financial resources, market intelligence, and access to industry networks (Chan *et al.*, 2020). This variability highlights the importance of selecting an accelerator equipped to address the unique needs of healthcare startups.

Unlike conventional platform startups in less regulated industries, born-digital health platforms face a fragmented healthcare ecosystem with multiple stakeholders, requiring careful coordination among providers, payers, and patients (Ruokolainen *et al.*, 2023). Their embedded social mission distinguishes them from purely commercial ventures, as they prioritize accessibility, cost reduction, and improved health outcomes (Pundziene *et al.*, 2023). In this context, accelerators play a critical role in aligning healthcare innovations with stakeholder needs and regulatory requirements, ensuring compatibility for successful adoption. While sector-specific accelerators provide tailored mentorship, networking, and resources, their effectiveness varies significantly depending on program design and industry specialization (Chan *et al.*, 2020; Chowdhury and Audretsch, 2019).

Domain-specific accelerators help mitigate the high resource demands of healthcare startups by fostering coopetition—a blend of collaboration and competition—among startups. This approach allows them to leverage shared knowledge and networking while maintaining competitive differentiation (Moritz *et al.*, 2022). These accelerators create structured environments where startups can engage in collaborative innovation while addressing the financial and operational complexities unique to the healthcare sector. However, the success of such knowledge-sharing initiatives depends on maintaining a balance between openness and protecting proprietary knowledge (Hallen *et al.*, 2020). Moreover, accelerators play a key role in reducing startup uncertainty, enabling founders to make more informed strategic decisions about funding, growth, and risk management (Yu, 2020). For instance, healthcare accelerators often help startups navigate sector-specific regulatory challenges, differentiating them from general-industry accelerators that primarily emphasize rapid scaling.

Recent studies have emphasized the complexities that digital health innovators face, particularly due to stringent regulatory barriers such as high evidentiary requirements for approvals and reimbursement, which many startups struggle to meet (Weimar *et al.*, 2025). Regulatory inconsistencies, exemplified by variable standards of approval and data privacy regulations like GDPR, further exacerbate these challenges (Weimar *et al.*, 2025). However, accelerators have shown potential to successfully support digital health startups by facilitating critical evidence generation and regulatory navigation, thereby enhancing startup performance in this highly regulated sector (Njoku *et al.*, 2023; Weimar *et al.*, 2025). These nuanced findings indicate that the role of accelerators in healthcare cannot be yet generalized; their effectiveness appears contingent upon their ability to explicitly manage and support compliance with healthcare-specific regulatory frameworks.

The effectiveness of accelerators in driving innovation adoption is shaped by their program structure, including the frequency of mentor consultations, engagement with prospective clients, and opportunities for networking among peers (Cohen *et al.*, 2019). However, non-domain-specific accelerators may struggle to provide the industry-specific expertise needed to tackle the regulatory and operational challenges of healthcare startups (Essén *et al.*, 2023). As a result, startups participating in these accelerators may face difficulties in aligning their strategies with sector-specific demands, particularly in highly regulated environments that require specialized validation and compliance processes (Essén *et al.*, 2023).

From an IDT perspective, domain-specific accelerators offer a relative advantage by facilitating startup integration into specialized networks that provide regulatory guidance, stakeholder engagement, and sector-specific alliance building. These networks support startup performance by enhancing access to targeted resources and strategic partnerships (Baum *et al.*, 2000). While accelerators can foster business model innovation in various industries, their impact on healthcare startup scalability depends on their ability to align with regulatory frameworks and ecosystem dynamics (Kapoor and Teece, 2021). This alignment is crucial for ensuring that healthcare startups can leverage accelerator programs effectively to scale their innovations in a high-stakes, compliance-driven environment. We thus hypothesize that:

H2. Domain-specific accelerators have a greater impact on the performance of born-digital health platform startups than non-domain-specific accelerators.

3. Defining the composite indicator method

To assess the performance of startups that develop healthcare platforms, we construct a composite indicator (CI). There are precedents in the literature for using composite indicators. El-Midany and Shalaby (2009) assessed one incubator with a less stylized methodological approach. More recent proposals using similar composite indicators to assess the performance of entrepreneurial ecosystems are Lafuente *et al.* (2021, 2022). Similarly, we adopt the widely known benefit of the doubt (BoD) model (Cherchye *et al.*, 2007). This method extends the non-parametric frontier models used to measure efficiency (Cooper *et al.*, 2007), which only consider output indicators. Its main advantage is that the weight assigned to each indicator is endogenous and individualized for each unit evaluated, which provides great flexibility and adaptability in evaluating the different strategies implemented by the units analyzed. From a methodological point of view, the BoD method optimizes the weights for each startup to maximize the composite indicator. In other words, the method assigns high weights to well-evaluated dimensions and low or zero weights in the opposite case.

BoD methods can be developed by using different non-parametric estimation methods. The most well-known efficiency estimators are the convex data envelopment analysis (DEA) and the non-convex free disposal hull (FDH), widely used in the previous empirical literature (Emrouznejad and Yang, 2018). However, criticisms of these methods are based on the lack of statistical properties and the high sensitivity to the presence of outliers. This problem can be particularly onerous when the data set is heterogeneous, as in the case we are dealing with here. To avoid these problems and increase estimation robustness, Cazals *et al.* (2002) developed the order-m estimators based on a probabilistic formulation (Daraio and Simar, 2005; D'Inverno and De Witte, 2020). The main idea consists of defining a partial optimization program, where the unit under analysis is compared with a sub-sample of m units taken from the K sample. The optimization program is carried out B rounds (where B is sufficiently large) [1]. In each round b ($b = 1, \ldots, B$), a sample with replacement of dimension m is drawn from the K units, obtaining B times the composite indicator (CI_b^k). Finally, the robust composite indicator CI^k is calculated as the arithmetic average of the different CI_b^k:

$$CI^k = \frac{1}{B}\sum_{b=1}^{B} CI_b^k \tag{1}$$

To estimate the subsequent CI_b^k indicators, B order-m BoD programs have to be solved for each k unit ($k = 1, \ldots, K$). The integer programs to be solved are as follows:

$$\begin{aligned}
&\text{min.} \quad CI_b^k = \beta, \\
&s.t. \quad Y_n^k \Big/ \beta - \sum_{i=1}^{m} \lambda_i\, Y_n^i \leq 0, \qquad n = 1, \ldots, N, \\
&\sum_{i=1}^{m} \lambda_i = 1, \\
&\lambda_i \in \{0, 1\}, \qquad i = 1, \ldots, m, \\
&m > 0.
\end{aligned} \tag{2}$$

where Y_n^k is the output indicator n ($n = 1, \ldots, N$) for the unit k under analysis; λ_i stands for the activity vector, and β is the value of the composite indicator for the unit k. A value of $\beta < 1$ means that the startup's performance is inefficient, while a value of $\beta \geq 1$ means that the unit under analysis is efficient. When heterogeneous samples are assessed, this methodology provides two important advantages: firstly, as a non-parametric method, the comparisons are defined by taking two real units (the one under scrutiny and the benchmark, which is the one that offers similar or better levels in the variables being compared), so proper homogeneous comparisons are defined. The second advantage is provided by the re-sampling procedure. This means that the potential impact of the outliers is limited as they will only enter occasionally in the subsequent sub-samples. Summing up, robustness and the most possible homogeneity among units are considered with this methodological approach.

4. Sample, output indicators, and descriptive statistics

This paper considers a sample of born-digital platform startups from the health industry. Data was obtained from *Dealroom*, a secondary database that provides extensive and up-to-date information from startups and tech ecosystems around the world [2]. *Dealroom* has the advantage over other providers of data on startups (such as *Pitchbook* or *Crunchbase*) in that it offers more complete data records and a higher level of disaggregation of industrial sectors, which allows us to obtain classified and precise information for health platform startups. Specifically, they define health platforms as "startups developing digital health platforms to improve health management for both patients and service providers".

The final sample consists of 235 born-digital startups launched between 2010 and 2021 [3]. For each startup we include the most recent information available, ensuring a consistent evaluation framework while balancing the inclusion of both new and mature startups. All startups in the sample were still active at the time of data collection, and observations with unavailable information for the output indicators considered were excluded. Regarding the geographical location of the startups and their associated accelerators, they are primarily located in Europe and North America. The startups and their associated accelerators are primarily located in Europe and North America: the majority of the 235 startups are based in Europe (210), with notable representation from France (51), Sweden (30), the United Kingdom (21), Spain (20), Germany (16), Finland (15) and Italy (14); most of the 25 startups from North America are located in the United States (22). Table 1 describes some key features of the startups included in the sample located in Europe and North America. As can be observed, the largest startups, characterized by higher median funding and larger team sizes, are found in North America, while European startups have a higher acceleration rate.

This distribution reflects the structure of available and complete data in *Dealroom* at the time of collection, rather than an intended regional emphasis. Although the geographic imbalance may limit generalizability—particularly to underrepresented regions such as the Global South—we chose to include the full population of eligible cases to maximize validity within the database constraints.

Table 1 describes some key features of the startups included in the sample located in Europe and North America. As can be observed, North America concentrates the largest startups in the sample, characterized by higher median funding and larger team sizes, while European startups exhibit a higher acceleration rate.

Table 1. Key features of the startups in the sample from Europe and North America

Geographical regions	No. startups	Funding (millions of $)	Size (number of employees)	% Accelerated	Main accelerators
Europe	210	3.3	27	49.05%	EIT Health e.V., MassChallenge, Plug and Play, Startupbootcamp, Techstars, Y Combinator
North America	25	22	44	28.00%	Hacking Health Accelerator, Plug and Play, Rockstart, Techstars

Source(s): Authors' own work

The following output variables are considered to construct the performance indicator:

(1) Valuation (Y_1), representing the economic value for the whole startup in millions of $.

(2) Funding (Y_2), referring to the total money raised by the startup in the funding rounds, expressed in millions of $.

(3) Revenues (Y_3), being the last known revenue amount the startup generated, expressed in millions of $.

(4) Employees (Y_4), represents the employment generated by the startups.

(5) Website users (Y_5), expressed in thousands, includes the number of visitors to the website, representing the scope of the services provided to the customers.

(6) Twitter followers (Y_6), expressed in thousands, representing the number of followers on the social media platform.

Our variables were selected to include different dimensions that cover a broad perspective of stakeholder interests (Freeman, 1984). From the point of view of the entrepreneur/owner, attracting funding or obtaining higher levels of revenues and startup valuation are signs of the startup's financial success. The employees' perspective is reflected by the employment generated, while the variables measuring the customers' interest in the use of the services provided, such as Twitter followers, encompass the customers' perspective. This last measure, although imperfect, is among the limited publicly available proxies that reflect startup visibility, early digital traction, and stakeholder engagement. These metrics have been used in prior research to approximate reach and resonance in early-stage ventures where financial or clinical outcome data are often unavailable (see, f.e., Antretter *et al.*, 2019). While we acknowledge the limitations of such variables, they provide a useful basis for cross-sectional analysis within the constraints of secondary data.

Table 2 presents the descriptive statistics of the output indicators and the proportion of startups that passed by accelerators [4]. The table shows that our sample includes 235 startups which, on average, raised around 33 m of $ and contracted 93 employees.

5. Results

In this section we present the results of the empirical analysis. Table 3 reports the results from the comparison of BoD composite indicators for accelerated and non-accelerated born-digital health platform startups. The findings first show that, in general, the performance levels are low: according to the composite indicator, the potential room for improvement of the born-digital health platform startups is more than double their current achievements. Second, the average performance for the subsample of startups supported by accelerators is 0.23 versus

Table 2. Descriptive statistics for the output variables to construct the performance indicator

	Mean	Median	Q1	Q3	s.d.
Valuation (Y_1)[a]	132.64	13.75	5.27	55.00	513.87
Funding (Y_2)[a]	32.92	3.96	1.25	15.27	97.49
Revenues (Y_3)[a]	7.46	0.67	0.22	2.34	27.81
Employees (Y_4)	93.63	29.00	13.00	64.00	222.88
Website users (Y_5)[b]	108.45	3.20	0.51	52.00	365.50
Twitter followers (Y_6)[b]	1.22	0.44	0.12	1.18	3.28
Startups supported by accelerators	110	46.81%			
Startups not supported by accelerators	125	53.19%			

Note(s): [a] In millions of $, [b] In thousands

Source(s): Authors' own work

Table 3. Results for the BoD composite indicators

	Mean	Median	Q1	Q3	s.d.
Complete sample (235)	0.32	0.12	0.05	0.36	0.46
Sub-sample of startups supported by accelerators (110)	0.23	0.11	0.05	0.24	0.34
Sub-sample of startups not supported by accelerators (125)	0.40	0.15	0.06	0.56	0.53

Source(s): Authors' own work

0.40 of startups not supported by accelerators (this trend is also consistent for the rest of statistics), and these values are significantly different according to the *p*-value of the Wilcoxon test ($p = 0.03 < 0.05$).

Thus, contrary to the theoretical expectation outlined in Hypothesis 1, startups without accelerator support outperform those that received it. This empirical evidence does not support H1 and suggests that the presumed benefits of accelerator participation may not lead to better performance in the healthcare sector.

A key challenge in evaluating the effects of accelerators lies in the fact that the decision to seek accelerator support is not random. It is reasonable to assume that health platform startups are likely to make this decision based on a mix of observable and unobservable factors. For example, startups with strong initial performance may choose not to join an accelerator because they already possess the skills and resources needed to compete. Conversely, those with weaker starting conditions may be more inclined to seek accelerator support, recognizing the potential benefits. As a result, failure to correct this non-random selection could lead to inconsistent estimates of the impact of using accelerators.

The selection bias discussed above may be present in the data shown in Table 3. While descriptive statistics are useful for summarizing observational data, they do not reveal the added value (or impact) of accelerator support. In other words, establishing causality in this context is challenging, as researchers in the social sciences cannot rely on controlled laboratory experiments (Serra, 2012). To answer the question rigorously, an experimental approach is needed to control for potential self-selection bias, since the assignment of startups to the treatment group (with accelerator support) or the control group (without it) is not random among units with similar characteristics. Therefore, results based on observational data are more likely to reflect underlying selection bias than to provide accurate estimates of the accelerator's causal effect.

One way to address this issue is through a quasi-experimental design. In this type of design, independent variables are considered before the dependent variable is measured. However, because participants are not randomly assigned, there may still be other differences between the groups (unrelated to the treatment), which means the problem of confounding variables is not entirely eliminated. As a result, quasi-experiments offer a level of internal validity that lies between that of purely observational studies and true experiments (Cook and Campbell, 1979) [5].

To implement the quasi-experiment, we apply propensity score matching (PSM), a technique that helps reduce self-selection bias by weighting and pairing observations based on similar characteristics (Glazerman *et al.*, 2003). This approach involves identifying pairs of startups that are closely matched on a set of relevant attributes, with one member of the pair having received accelerator support (the treatment) and the other not. As a result, we construct two groups of equal size, where each startup in the treatment group is matched to a similar startup in the control group. The matching is based on variables such as: the percentage of founders currently active in the startup, the percentage of female founders, the percentage of serial entrepreneurs, the proportion of founders ranked among the top 25% of previous founders, the percentage who attended top 25 universities, and the percentage with prior entrepreneurial experience. This allows us to isolate the effect of the treatment—in this case, accelerator support—more reliably [6].

When applying this technique, it is important to assess the quality of the matching. This can be done visually, through graphical methods, or statistically, using *t*-tests that evaluate whether the matching process has sufficiently reduced significant differences in the distribution of pre-treatment variables between the treatment and control groups (Caliendo and Kopeinig, 2008). In our case, the results were satisfactory: we failed to reject the null hypothesis of no mean difference for all covariates, except for the percentage of serial founders (see Table 4). This indicates that the characteristics of the startups in the treatment group are largely comparable to those in the control group, suggesting that the matching was successful.

Table 5 presents the comparison of composite indicator scores between startups that received accelerator support and those that did not, after applying the PSM procedure (i.e. matched treatment and control units). The first horizontal panel in Table 5 shows a statistically significant difference in average performance ($p = 0.00073$). This indicates that even after controlling for selection bias through PSM, performance still differs between accelerated and non-accelerated born-digital health platform startups. Consequently, theoretical H1 is again not supported.

Additionally, a simple regression was performed to examine the effect of accelerator support on startup performance. The BoD indicator was used as the dependent variable, and accelerator participation (Yes/No) served as the explanatory variable. As shown in the last column of Table 5, the coefficient for this binary variable is statistically significant and negative, with a value of −0.225. This suggests that accelerator support does not appear to equip startups with capabilities that lead to superior performance compared to their non-accelerated counterparts. On average, accelerator participation is associated with a 0.225

Table 4. Differences in the covariate means between accelerated and non-accelerated startups

Covariates	Accel. (No)	Accel. (Yes)	*t*-test	*p*-value
% current founders actively involved in the startup	0.9134	0.9403	−0.8824	0.3787
% female founders	0.1075	0.1553	−1.2121	0.2271
% of serial founders	0.3092	0.1879	2.4196	0.0165
% current founders among top 25 past founders	0.0443	0.0668	−0.8031	0.4230
% founders from top 25 universities	0.1595	0.1604	−0.0198	0.9842
% founders with prior experience	0.1616	0.1502	0.2679	0.7891

Note(s): $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Source(s): Authors’ own work

Table 5. Comparison of the composite indicators after the implementation of the PSM

Accelerator	Mean	*t*-test	*p*-value	△ BoD
Yes	0.23	3.44	0.00073	−0.225
No	0.44			

Type accelerator	Mean	*t*-test	*p*-value	△ BoD
Health	0.21	0.82	0.41	−0.098
General	0.26			

Note(s): $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Source(s): Authors’ own work

decrease in performance. Comparing the results from Tables 3 and 5, we observe that the average composite indicator for non-accelerated startups increases from 0.40 to 0.44 after applying PSM. In contrast, the average performance of accelerated startups remains unchanged, further widening the performance gap between the two groups.

Table 5 also includes results relevant to testing theoretical Hypothesis 2. Specifically, the second horizontal panel examines whether the type of accelerator–domain-specific (health-focused) versus non-domain-specific–has a differential impact on the performance of accelerated startups. The test yields a *p*-value of 0.41, indicating that the null hypothesis of equal average composite indicators cannot be rejected; in other words, the differences are not statistically significant. Moreover, the coefficient for the binary variable representing accelerator type is −0.098 and also not statistically significant. Therefore, these findings do not support H2, suggesting that domain-specific health accelerators do not offer additional value in terms of startup performance compared to general-purpose accelerators.

5.1 Robustness check

As mentioned in Section 4, our sample includes startups and accelerators primarily located in Europe and North America. To strengthen the robustness of our findings, by avoiding the influence of regional differences (such as funding environments and legislative climates in shaping startup ecosystems), we conducted a robustness check using the PSM procedure by splitting the sample into two contexts: Europe and North America (due to the limited number of observations in some countries, detailed country-specific analyses are not feasible and would not yield statistically robust insights). By addressing these regional distinctions, we ensure that our main analysis is robust to potential structural differences between ecosystems, including variations in funding climates, market sizes, and entrepreneurial culture.

First, we repeated the PSM procedure exclusively for the European startups (210 units). Table 6 presents the results for the means of pre-treatment covariates between the treated group (i.e. accelerated startups) and the control group (non-accelerated startups). The results prevent us from rejecting the null hypothesis that the means are equal for all covariates ($p > 0.05$), with the exception of the variable % of serial founders, which remains statistically significant. Given that the covariates in the treatment group are similar to those in the control group, we consider the matching to be successful and the effect of the treatment (accelerator support) to be adequately isolated.

We then repeated the analysis for the North American sample (25 units). According to the results in Table 7, we cannot reject the null hypothesis that the means of pre-treatment covariates are equal between groups ($p > 0.05$), in cases where the analysis could be conducted. However, the available data did not allow us to perform the analysis for the percentage of current founders actively involved in the startup and the percentage of female founders, as

Table 6. Differences in the covariate means between accelerated and non-accelerated startups, European subsample

Covariates	Accel. (No)	Accel. (Yes)	*t*-test	*p*-value
% current founders actively involved in the startup	0.9035	0.9451	−1.2151	0.2263
% female founders	0.1088	0.1758	−1.5268	0.1289
% of serial founders	0.3068	0.1297	3.5236	0.0006
% current founders among top 25 past founders	0.0278	0.0669	−1.4225	0.1577
% founders from top 25 universities	0.1397	0.1552	−0.3315	0.7407
% founders with prior experience	0.1628	0.1297	0.7486	0.4552

Note(s): $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Source(s): Authors' own work

Table 7. Differences in the covariate means between accelerated and non-accelerated startups, North American subsample

Covariates	Accel. (0)	Accel (1)	*t*-test	*p*-value
% of serial founders	0.3889	0.4167	−0.0979	0.9239
% current founders among top 25 past founders	0.3333	0.0833	1.1208	0.3091
% founders from top 25 universities	0.1667	0.2222	−0.2370	0.8174
% founders with prior experience	0.2222	0.1667	0.2370	0.8174

Note(s): $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$
Source(s): Authors' own work

these variables remain constant within the North American subsample. Despite this limitation, the remaining results indicate that the matching procedure was effective in balancing the covariates across groups.

Finally, Tables 8 and 9 present the results of comparing the composite indicator for startups that had an accelerator and those that did not, after implementing the PSM (i.e. units from the treatment and the control groups), for both the subsamples of European and North American startups.

Table 8. Comparison of the composite indicators after the implementation of the PSM, European subsample

Accelerator	Mean	*t*-test	*p*-value	ΔBoD
Yes	0.2097	2.5735	0.0112	−0.1651
No	0.3748			

Type accelerator	Mean	*t*-test	*p*-value	ΔBoD
Health	0.2691	1.0445	0.2996	0.0753
General	0.1938			

Source(s): Authors' own work

Table 9. Comparison of the composite indicators after the implementation of the PSM, North American subsample

Accelerator	Mean	*t*-test	*p*-value	ΔBoD
Yes	0.4123	1.2361	0.0257	−0.5149
No	0.9273			

Type accelerator	Mean	*t*-test	*p*-value	ΔBoD
Health	0.4292	−0.7842	0.4725	0.1661
General	0.2631			

Source(s): Authors' own work

As we can observe, the results align with those from the full sample, confirming that accelerators influence performance. However, this influence does not occur as we initially anticipated. Consistent with the full sample analysis, digital healthcare platform startups that participate in accelerator programs do not perform better than those that bypass such programs. Likewise, the type of accelerator does not show a significant effect. Nonetheless, the limited number of observations in the North American subset prevented the completion of two planned tests, posing a limitation to the interpretation and generalization of these results.

6. Discussion and conclusions

This study explores the impact of accelerators on the performance of born-digital health platform startups, offering critical insights that challenge conventional assumptions about accelerator programs. Despite the growing body of literature on accelerated startups, clarity is still lacking regarding whether and how accelerators influence the performance of born-digital health startups. By addressing this gap, the study contributes to the evolving discourse on early-stage entrepreneurship and advances the understanding of how accelerators shape the performance trajectories of born-digital health platform startups. This paper adds to the emerging born-digital startup acceleration literature by questioning the universal applicability of accelerator programs across different sectors.

Using data from 235 born-digital health startups, divided into accelerated (110) and non-accelerated (125), and employing composite indicators and propensity score matching to address selection bias, we confirmed that the observed performance differences were not due to random variation but reflected inherent differences in the efficacy of accelerators for digital health startups. Contrary to established beliefs (Cohen *et al.*, 2019; Drori and Wright, 2018; Hallen *et al.*, 2020; Mian, 2021; Pauwels *et al.*, 2016), our findings reveal that non-accelerated born-digital health startups outperform their accelerated counterparts, with significantly higher average performance scores.

Drawing on dynamic capabilities theory (DCT) and innovation diffusion theory (IDT), we hypothesized that accelerators enhance startup performance by equipping firms with the resources and capabilities necessary to sense, seize, and transform opportunities. However, our results challenge these theoretical premises. One explanation for these findings is that highly capable startups may perceive accelerators as unnecessary, as they already possess the expertise and networks needed to thrive. For example, some startups might be founded by experienced professionals within the health sector (e.g. medical specialists or individuals with a personal history of frustration with the current state of affairs), who have a deep understanding of the business opportunities. Alternatively, accelerated startups may lack the foundational capabilities required to leverage the resources provided by accelerators effectively (Cohen *et al.*, 2019; van Weele *et al.*, 2017). Many health startups may also lack the necessary experience and strategic foresight to fully capitalize on the opportunities provided by accelerators, resulting in suboptimal outcomes (Mansoori *et al.*, 2019). This finding aligns with our dataset, which shows a higher proportion of serial founders among non-accelerated startups, suggesting that prior entrepreneurial experience may play a crucial role in determining which startups choose to participate in accelerators and how effectively they utilize the resources provided.

Another plausible explanation lies in the unique challenges of the healthcare sector, which is highly regulated and characterized by a risk-averse culture (Essén *et al.*, 2023). Accelerators may struggle to provide the specific capabilities necessary to navigate this complex landscape, such as expertise in regulatory compliance and stakeholder engagement, although required expertise in health-focused particulatiries is not granted. In this context, born-digital health startups may face difficulties aligning their perceived needs with the resources offered by accelerators, further limiting the impact of these programs. For instance, accelerators are driven by short-term investment and return cycles (Hochberg, 2016), while health startups pursue long-term impact. These challenges are also compounded by the modular, interconnected, and scalable characteristics inherent to digital businesses, which create dynamic environments where technology and market conditions evolve rapidly. This modularity allows competitors to replicate and improve upon existing solutions quickly, making it difficult for startups to sustain a competitive edge based solely on resource availability (Pundziene and Geryba, 2024).

This mismatch between startup needs and accelerator offerings is further corroborated by recent findings from Silva *et al*. (2022), who examined incubator–venture relationships in health-focused innovations. They found that only a small fraction of accelerators are designed with healthcare-specific goals in mind—most offer generic support, such as general business training and financial access, while neglecting core needs like regulatory preparedness, clinical validation, and responsible innovation alignment. This misfit often leads to suboptimal outcomes for ventures aiming to generate social or environmental value in healthcare, reinforcing the view that health-specific acceleration must move beyond one-size-fits-all templates and adopt mission-oriented, sector-informed practices.

By testing hypotheses grounded in dynamic capabilities theory and innovation diffusion theory, this study sheds light on the role of accelerators in startup ecosystems. While these theories provide valuable frameworks for understanding how resources and innovations diffuse, the findings underscore the importance of applying these models in ways that reflect the unique demands of highly regulated industries like healthcare.

Although our results indicate that the overall performance of accelerated startups may be lower, prior research highlights the potential for accelerators to support startup survival, particularly in their early stages (Del Sarto *et al*., 2020). Accelerators offer resources such as funding, mentorship, and networking opportunities, which could help startups convert these inputs into performance improvements, depending on their inherent capabilities. However, the disparity between perceived and actual benefits suggests that participation in accelerator programs may not universally translate to superior outcomes, and in some cases, might even hinder performance.

Notably, our research highlights the limited performance differences between domain-specific (health-focused) and general accelerators. Despite the assumption that specialized knowledge would benefit digital health startups, no significant advantage was observed for domain-specific accelerators. This aligns with prior studies emphasizing the variability in accelerator quality and effectiveness (Del Sarto *et al*., 2020; Hallen *et al*., 2020; Kramer *et al*., 2023). Furthermore, while specialized accelerators are increasingly common in the healthcare sector, our findings suggest that inherent startup capabilities and adaptability may play a more critical role than external support in determining success (Roberts and Kim, 2023). Indeed, health startups require long clinical and regulatory validation cycles, as well as rigorous scientific evidence, both of which are factors that accelerators are generally unable to provide (Shah and Arora, 2024).

7. Implications

From a theoretical standpoint, our findings call for a potential re-evaluation of how dynamic capabilities theory applies in high-stakes, regulated sectors like healthcare. While DCT posits that external support—such as that provided by accelerators—enhances a firm's ability to sense, seize, and reconfigure resources, our study suggests this assumption may not hold when the environment imposes steep regulatory and knowledge barriers. In particular, the finding that non-accelerated startups outperform those that participated in accelerators points to the possibility that certain ventures already possess internally developed capabilities that reduce their dependency on external facilitation. This contrasts the conventional assumption in DCT that accelerators universally enhance performance through capability development, suggesting instead that sectoral context and founder experience may moderate these effects.

From a managerial perspective, our findings suggest that entrepreneurs should critically evaluate the alignment between accelerator offerings and their specific regulatory, clinical, and market access needs, particularly within the highly regulated healthcare sector. Entrepreneurs must proactively assess whether accelerators offer sufficient support for evidence generation, regulatory compliance, and stakeholder engagement factors crucial to healthcare innovation success. Startups emerging from accelerators that offer structured regulatory support and emphasize evidence generation will enjoy a credibility premium. For investors, our study highlights the importance of adjusting their evaluation strategies beyond merely considering accelerator participation as a success indicator. Rather than treating any accelerator badge as a de facto positive signal, investors should interrogate which accelerator a health startup attended and what concrete competencies were gained. The emphasis must shift toward accelerators that demonstrably add value in navigating healthcare's regulatory and evidence hurdles. Instead, investors should focus on accelerator programs that explicitly offer regulatory expertise, structured stakeholder connections, and robust evidence-generation support to ensure sustainable scaling in healthcare markets. Investors are advised to adjust their due diligence frameworks accordingly: rather than viewing accelerator attendance as an unqualified positive signal, they should privilege those programs with a track record of producing clinically validated and compliance-ready health ventures.

In parallel, policymakers play a pivotal role in strengthening the healthcare innovation ecosystem by reducing regulatory bottlenecks that hinder startup scalability. Our findings support policy interventions such as establishing "regulatory sandboxes" or streamlined pre-certification schemes tailored specifically for digital health ventures. These controlled environments can accelerate innovation by allowing startups to test solutions under flexible regulatory oversight, thereby easing navigation through complex frameworks such as FDA approval processes or GDPR compliance.

Additionally, public funding and incentive programs should be directed toward accelerators that embed regulatory expertise, clinical validation support, and stakeholder engagement training into their offerings. This would help close the persistent gap between accelerator resources and the sector-specific needs of healthcare startups (Njoku *et al.*, 2023). These recommendations align with Silva *et al*. (2022), who emphasize the importance of evolving support programs into "fit-for-purpose" structures that advance responsible healthcare innovation aligned with public health goals. Policy efforts should thus aim not only to reduce regulatory friction, but also to strategically fund accelerators that demonstrate alignment with public health objectives, support clinical pathways, and embrace value-sensitive innovation principles.

To further enhance impact, policymakers and accelerator designers should move away from generic support schemes and instead adopt a more differentiated approach. Segmenting startups by factors such as prior entrepreneurial experience, domain knowledge, and regulatory preparedness can guide the design of more tailored interventions. Examples include embedding regulatory experts within accelerator teams, offering mentorship focused on data protection or clinical pathways, and extending program durations to better match the innovation pace in healthcare. Such adjustments would foster stronger alignment between accelerator offerings and startup needs, ultimately improving long-term performance outcomes.

8. Limitations and future research

We have to recognize that this study has several limitations. First, reliance on secondary data constrained the choice of performance indicators. Metrics like Twitter followers and website activity serve as proxies for early-stage traction but do not fully capture user adoption. Second, the sample is geographically skewed, with European startups overrepresented due to data availability, limiting generalizability—especially in regions with less digital visibility or different healthcare ecosystems. Additionally, findings may not apply to other sectors, as healthcare-specific contextual factors likely shape outcomes. Taking these limitations into account, future research could improve representativeness, adopt broader measures of startup visibility and stakeholder engagement, and compare startups in other regulated industries, such as fintech. Such comparisons could clarify the role of regulatory frameworks, stakeholder complexity, and industry norms in shaping performance and scalability.

We also consider interesting examine how accelerators support born-digital health startups at different stages, focusing on long-term impacts. This includes assessing early-versus later-stage challenges, misalignments between program resources and startup needs, and the effects of regulatory barriers. Research could also explore how alignment with healthcare governance and service integration affects scaling, sustained innovation, and system-level contributions. Exploring differential impacts on surviving versus failed startups would also be valuable. Including survival as an outcome would provide a fuller view of accelerator effectiveness. Building on Mejia and Gopal (2018), future studies could examine how acceleration influences both growth and viability in regulated sectors. Finally, while this study focused on participation effects, qualitative or mixed-methods research could uncover mechanisms such as mentorship quality, regulatory fit, and founder preparedness that may be related to the underperform of some accelerators. Interviews with founders, program managers, and stakeholders could offer critical insights into the contextual factors shaping acceleration outcomes [7].

Notes

1. Daraio and Simar (2005) suggested setting a minimum value of 200 for *B*.
2. Data were retrieved from *Dealroom.com* on April 2023. Further details on the characteristics of this database are available at https://dealroom.co
3. We focused on startups launched between 2010 and 2021 primarily due to data availability and completeness. Additionally, restricting the sample to the last decade helped reduce heterogeneity in firm age and ensured a more balanced comparison across startups, as most firms in the sample are between 2 and 8 years old.
4. *Dealroom* defines accelerators as a type of investor for the platforms, specifically, "fixed-term, cohort-based programs that include seed investment, connections, sales, mentorship, educational components, and culminate in a public pitch event or demo day to accelerate growth."
5. Recent articles using these methods to compare performance indicators of start-ups are Ayoub *et al*. (2017), Kher *et al*. (2023), Benkraiem *et al*. (2023) and Qi and Ning (2023).
6. Optimal full matching was performed using the MatchIt package (Stuart *et al*., 2011) in R.
7. We thank one reviewer for this valuable suggestion, which we believe adds a meaningful dimension to the research agenda in this field.

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