Chapter 3
Code Meets Care:
The Digital Shift in Health Promotion

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ABSTRACT

This chapter examines the transformative evolution of digital health from fragmented technological applications into a comprehensive, multidisciplinary ecosystem that fundamentally redefines healthcare delivery and patient engagement. Driven by rapid advancements in artificial intelligence, wearable devices, the Internet of Things, digital therapeutics, multi-omics integration, and extended reality, digital health shifts care paradigms from reactive, clinician-centered models to proactive, precise, predictive, preventive, and participatory approaches. The COVID-19 pandemic accelerated widespread adoption of digital solutions, demonstrating their capacity for agile crisis response while exposing persistent challenges such as the digital divide, interoperability limitations, and inequities in access. The chapter explores how digital health addresses major systemic pressures—including the rising burden of non-communicable diseases, healthcare workforce shortages, and escalating costs—through scalable, data-driven innovations that support value-based care, real-time monitoring, personalized interventions, lifestyle modification, and improved outcomes that matter to patients. While highlighting the potential to empower individuals as active participants in their health management within everyday contexts, the discussion critically addresses key barriers: ethical concerns, regulatory fragmentation, algorithmic bias, data privacy risks, and the need for inclusive, context-sensitive implementation strategies. Ultimately,

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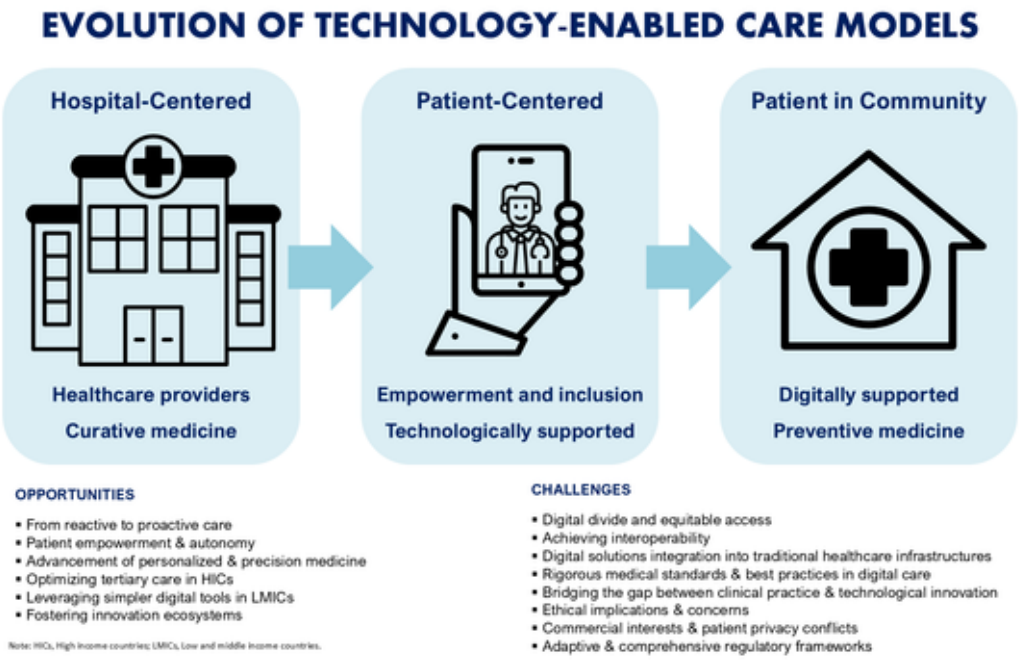
this chapter argues that realizing the full promise of digital health requires rigorous evidence generation, participatory design, equitable frameworks, and collaborative governance to ensure that technological progress translates into sustainable, resilient, and human-centered health ecosystems that promote well-being for all populations.

INTRODUCTION

Figure 1. Evolution of technology-enabled care models



In an age where technology shapes nearly every aspect of our lives, digital health stands at the forefront of a profound transformation - one that promises to reshape healthcare. Far from being a mere extension of traditional clinical care into digital platforms, digital health redefines care, from reactive and episodic care to a vibrant and continuous journey of well-being, catalysed by technological innovation, global health challenges, and shifting societal expectations. It reflects a broader multidisciplinary and rapidly evolving domain that is transforming how health systems operate and how individuals engage with their own health, supporting a more responsive and person-centred care (European Commission, 2020; WHO, 2021). This transformation calls for the reimagination of healthcare journeys in order to promote long-term well-being, enhancing health outcomes and reconfiguring care delivery.

The COVID-19 pandemic served as a global inflection point, accelerating the adoption of digital health solutions and exposing both their potential and limitations. It highlighted the strategic importance of digital infrastructures, the need for interoperability and the value of real-time data in supporting agile, evidence-based responses to health crises (Ganesan & Tong, 2024; OECD, 2023; Ogundiya et al., 2024). At the same time, it underscored persistent gaps in access, digital literacy and system readiness, issues