National Journal of Multidisciplinary Research and Development
www.newresearchjournal.com
ISSN: 2455-9040
Received: 18-10-2025, Accepted: 17-11-2025, Published: 02-12-2025
Volume 10, Issue 4, 2025, Page No. 59-63

The evolution of western medical paradigms in the twentieth century and the reconstruction of holistic health

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Abstract
This study explores the paradigm evolution of twentieth-century Western medicine and the reconstruction of holistic health from the perspective of medical and intellectual history. Through a historical–documentary analysis, it traces the transformation of medical thought from the *clinical revolution* and the establishment of the *biomedical model* to the rise of *public health governance*, *medical globalization*, and the subsequent return to *holistic health*. The findings indicate that Western medicine underwent a complete epistemological cycle: from the empirical bedside practice of the eighteenth century to the laboratory-based biomedicine of the nineteenth, the institutionalized public health systems of the early twentieth, the global expansion driven by wars and Cold War politics, and finally, the integrative, human-centered orientation of the late twentieth century. While biomedicine achieved unprecedented success in disease control, life expectancy, and equality of access, it also created epistemic and ethical imbalances through reductionism, medicalization, and industrialization. The holistic health movement since the 1970s represents both a critique and correction of biomedicine's limitations, emphasizing multidimensional well-being that integrates biological, psychological, and social factors. The paper concludes that the essence of twentieth-century Western medicine is the dialectical tension between scientific rationality and humanistic concern. Future healthcare must reestablish equilibrium between technology and humanity, restoring the original telos of medicine as the care of the whole person.

Keywords: Western medicine, biomedical model, public health, medicalization, holistic health, medical history, health humanities

Introduction

The twentieth century witnessed a profound transformation in Western medicine—from traditional experiential healing to a mature scientific paradigm. This shift not only redefined medical practice but also reshaped the philosophical and social meanings of *health* and *disease*. As historians such as Roy Porter (1997) [27] and Michel Foucault (1973) have argued, modern medicine emerged through the reorganization of clinical perception, the quantification of disease, and the institutionalization of medical authority. Yet the twentieth century's medical revolution was not merely technological; it was epistemological and cultural.

The central trajectory of this evolution can be summarized as a movement "from the clinical revolution to the biomedical system, and from there to the return of holistic health." Early transformations—marked by *depersonalization* and *professionalization*—objectified the patient and defined illness as a measurable biological deviation. Later reformulations, particularly after the 1970s, sought to reintegrate the human person by emphasizing psychosocial and environmental determinants of well-being. Most existing histories of medicine focus on either technological breakthrough (e.g., Starr, 1982; Rosen, 1985) [29, 31] or the evolution of national health systems (e.g., Klein, 2010) [18], but few offer a synthetic account linking scientific, institutional, and philosophical dimensions. Moreover, as scholars of medical humanities such as Huber *et al.* (2011) [14] and Marmot (2005) [22] suggest, the twentieth century saw health knowledge shift from private experience to public governance—a transformation that requires both historical and ethical reflection.

Accordingly, this study divides the development of Western medicine into three major stages. Firstly, Formative Period (late eighteenth to nineteenth century): the *clinical revolution* and *cellular pathology* laid the foundation for empirical, standardized medical knowledge. Secondly, Expansion Period (early to mid-twentieth century): medicine became institutionalized through *public health* and globalized through *war and Cold War*. Finally, Reflective Period (late twentieth century onward): *holistic health* and *integrative medicine* emerged to address the limits of biomedical reductionism. The paper's objectives are twofold: first, to analyze how epistemic and institutional shifts in medicine transformed Western conceptions of health; and second, to examine how the twenty-first-century holistic paradigm seeks to reconcile scientific progress with humanistic integrity. We argue that the twentieth century's medical evolution reflects a constant negotiation between the logic of *scientific rationalization* and the imperative of *humanistic reintegration*.

The Clinical Revolution and the Foundations of Biomedicine

The clinical revolution of the late eighteenth and early nineteenth centuries marked the decisive epistemological rupture between traditional empiricism and modern scientific medicine. As Foucault (1973) described in *The Birth of the Clinic*, the medical gaze shifted from the patient's narrative to the pathological lesion, transforming the hospital from a place of charity into a laboratory of knowledge. In France, physicians such as Pierre Charles Alexandre Louis developed "numerical medicine," systematically recording symptoms, outcomes, and

postmortem findings to establish statistical correlations. His research on pneumonia demonstrated that bloodletting, a centuries-old therapy, had no measurable benefit—a foundational moment for evidence-based reasoning (Rosen, 1985) [29]. The French approach emphasized *systematic bedside observation* and the aggregation of large case series. This empirical logic transformed clinical medicine into a quantifiable science, capable of producing reproducible knowledge. By classifying symptoms and correlating them with anatomical findings, nineteenth-century physicians created an "anatomical taxonomy" of disease—precisely what later allowed diagnostic specialization.

In Germany, the revolution took a different path. While French medicine privileged the "collective observation" of hospital cases, German medicine advanced through *microscopic reductionism*. The invention of more powerful microscopes and staining techniques permitted the study of tissues and cells, culminating in the emergence of *cellular pathology*. Rudolf Virchow's (1858/1995) seminal work, *Cellular Pathology*, argued that "all diseases are diseases of cells" (*omnis cellula e cellula*). By locating pathology within the cell, Virchow replaced organ-level theories with a microscopic understanding of illness. This breakthrough transformed the medical object from the suffering person to the malfunctioning biological unit.

The implications were revolutionary. Disease became not a disturbance of balance or temperament but a specific cellular malfunction. Consequently, medical education shifted toward laboratory training, pathology museums, and anatomical dissection. The physician's authority came to rest not on personal wisdom but on empirical knowledge and technical expertise. This transition, as Daston and Lunbeck (2011) [8] note, reflected the nineteenth century's broader epistemic ambition—to make human life measurable, controllable, and predictable. However, the clinical revolution's triumph came at the cost of *depersonalization*. Patients were increasingly viewed as *cases* rather than *persons*, their subjective experiences replaced by temperature readings, pulse charts, and autopsy findings. This "objectification of suffering" (Armstrong, 2014) [2] created the epistemic foundation for the later *biomedical model*, which defined disease purely as a deviation from biological normality. While this enabled diagnostic precision and therapeutic progress, it also marginalized the moral and existential dimensions of illness—issues that would resurface in the holistic health movement a century later.

The Institutionalization of Public Health and National Health Governance

By the mid-nineteenth century, industrialization and urban crowding produced new public health crises—cholera, typhoid, tuberculosis—that private medicine alone could not address. Western states began to integrate health into their administrative apparatus, marking the birth of *modern public health governance*. The 1848 British *Public Health Act* institutionalized sanitation, drainage, and water supply as government responsibilities. Edwin Chadwick's sanitary reform linked disease causation to environmental conditions, anticipating later epidemiological models (Hamlin, 2009) [13]. In Germany, Otto von Bismarck's *Health Insurance Act* (1883) combined welfare and state power: workers received medical benefits in exchange for loyalty to the state, illustrating how health became both a social right and a political instrument (Starr, 1982) [31]. Simultaneously, *social medicine* emerged as a discipline linking biological and social determinants of disease. Alfred Grotjahn (1902) argued that tuberculosis among industrial workers was not merely a bacterial problem but a consequence of malnutrition, overcrowding, and poor labor conditions. The insight that social inequality produced differential morbidity reoriented public health toward policy intervention—a theme later expanded by Michael Marmot's (2005) [22] theory of the *social gradient in health*. These developments institutionalized medicine as an instrument of governance. Schools conducted nationwide health surveys; municipal boards regulated housing, water, and waste; and states introduced compulsory vaccination programs. The "medical police" (*Medizinalpolizei*) of nineteenth-century Germany exemplified how medical expertise became embedded in administrative law (Porter, 1997) [27].

Yet public health's triumph also displaced other forms of health knowledge. Religious healing and community midwifery, once central to family and spiritual life, were delegitimized as *unscientific*. Biomedicine thus consolidated its monopoly not only through laboratory evidence but also through bureaucratic rationalization. By the early twentieth century, Western states had effectively transformed *health* from a private virtue into a public obligation—a development that laid the groundwork for later welfare-state medicine. Globally, the institutionalization of public health became a vector of Western influence. The establishment of the *International Office of Public Hygiene* in 1907 and, later, the *League of Nations Health Organization* (1920) exported European sanitation norms to colonized and developing regions (Berridge, 2005) [4]. While these measures reduced mortality, they also imposed Eurocentric health standards that ignored local ecologies and traditions. The twentieth-century "global health divide" between industrialized and developing nations has its roots in this asymmetrical diffusion of biomedical governance.

War, Cold War, and the Globalization of Western Medicine

The two world wars acted as catalysts for technological acceleration in medicine. Under the pressure of mass casualties, surgical techniques, anesthetics, antibiotics, and radiological diagnostics advanced with unprecedented speed. During World War I, battlefield medicine standardized anesthesia and transfusion. The discovery of blood groups (ABO system) and the organization of mobile transfusion units reduced mortality rates by nearly one-third (Porter, 1997) [27]. The war also institutionalized aseptic surgery and rehabilitation medicine, as thousands of amputees required prosthetic innovations.

World War II extended this trend. The mass production of penicillin, coordinated by the U.S. War Production Board, reduced postoperative infections to historically low levels (Lax, 2004) [20]. Portable X-ray units and antibiotics transformed combat medicine and were later absorbed into civilian hospitals. The war also generated an entirely new medical field—rehabilitation medicine—linking surgery, physiotherapy, and psychology to reintegrate wounded soldiers into society. These military-driven innovations laid the foundation for the postwar *medical–industrial complex*. The establishment of the U.S. *National Institutes of Health (NIH)* in 1946 institutionalized research funding that had previously served military ends. In Britain, the *National*

Health Service (NHS) (1948) translated wartime solidarity into universal healthcare access (Klein, 2010) [18]. Medicine thus became simultaneously a scientific enterprise and a state apparatus.

After 1945, global health became a field of geopolitical competition. The *World Health Organization (WHO)*, founded in 1948, proclaimed an unprecedented definition of health: "a state of complete physical, mental, and social well-being and not merely the absence of disease." While this reflected holistic aspirations, in practice, WHO programs prioritized infectious disease control, vaccination, and technical interventions—extensions of the biomedical paradigm. The United States used medical aid as an instrument of Cold War diplomacy through the *Point Four Program* (1949) and USAID's global health initiatives. Hospitals, training programs, and vaccine campaigns in Asia, Africa, and Latin America exported American biomedical models while marginalizing indigenous healing systems (Packard, 2016) [26]. Western medicine became synonymous with modernization. For instance, U.S. support for India's *All India Institute of Medical Sciences (AIIMS)* institutionalized Western-style medical education, gradually displacing Ayurveda from mainstream health policy. Similarly, the *Pan American Health Organization (PAHO)* promoted Western protocols for malaria eradication, reinforcing hierarchical dependencies between donor and recipient nations. Meanwhile, the Soviet Union advanced a competing socialist model emphasizing preventive care and state responsibility, exemplified by its polyclinic system and medical internationalism in Cuba and Vietnam (Brown & Fee, 2014) [5]. However, limited resources and technological lag hindered its global influence. As historians such as Marcos Cueto (2007) [7] argue, the Cold War transformed medicine into a soft-power instrument: vaccines and hospitals became symbols of ideological superiority. Yet this global diffusion also entrenched inequality. High-technology medicine concentrated in the industrial North, while the developing South remained dependent on external aid.

By the mid-twentieth century, the expansion of pharmaceutical and insurance industries transformed health into a major economic sector. Starr (1982) [31] characterized this convergence of science, profession, and capital as the rise of the *medical–industrial complex*. In Europe, national health systems such as the NHS and Germany's social insurance schemes institutionalized medicine as a universal right. These systems dramatically improved population health—Britain's infant mortality fell from 60 per 1,000 births in 1948 to 20 in 1970—but also created massive fiscal pressures (Klein, 2010) [18]. In the United States, private insurance dominated, leading to stratified access and spiraling costs: healthcare expenditure rose from 5% of GDP in 1960 to over 13% by 2000.

The 1950s–1970s marked the pharmaceutical industry's "golden age." Antibiotics, antihypertensives, and contraceptives transformed public health while generating enormous profits. Yet corporate influence also blurred the boundaries between science and marketing. Conrad (2007) [6] and Greene (2013) [12] note how diagnostic thresholds were widened to expand drug markets—redefining hypertension, depression, and attention deficit as chronic pharmacological conditions. This industrialization of medicine produced both efficiency and alienation. On one hand, health became a social right; on the other, it became a commodity. The physician–patient relationship, once personal, was increasingly mediated by bureaucratic and corporate interests. As Engel (1977) [10] argued in his foundational paper on the *biopsychosocial model*, biomedicine's success in curing disease was matched by its failure to address the human experience of illness. By the 1970s, Western medicine had reached its technological zenith but also its existential limit. The question was no longer how to treat disease but how to define health in a world dominated by technology, institutions, and markets.

Achievements and Limitations of Twentieth-Century Western Medicine

The twentieth century produced what Omran (1971) [24] famously called the *epidemiologic transition*: infectious disease gave way to chronic, degenerative illness as the dominant health burden. In the span of a hundred years, global life expectancy more than doubled—from roughly 35 years in 1900 to over 70 by 2000 (WHO, 2000) [36]. This dramatic shift reflected unprecedented success in disease prevention, clinical therapy, and population health policy. Three converging forces underpinned the medical achievements of the century. First, public-health infrastructure reduced exposure to pathogens through clean water, vaccination, and sanitation. Cholera, typhoid, and tuberculosis mortality fell by over 90 percent across industrial nations (Hamlin, 2009) [13]. Second, scientific therapeutics—antibiotics, vaccines, surgical innovation—turned formerly fatal infections into curable conditions. Third, socialized medicine established health as a civic entitlement rather than a privilege.

Postwar welfare states exemplified this transformation. Britain's *National Health Service* (1948) provided free universal coverage; Sweden's 1962 National Health Insurance integrated preventive and rehabilitative care; and the United States' *Medicare* and *Medicaid* programs (1965) extended benefits to the elderly and poor. These systems, despite structural differences, embedded *health equity* within the moral economy of democracy (Reinhardt *et al*., 2004) [28]. Equally important was the rise of evidence-based medicine (EBM). Building on the statistical logic pioneered by Pierre Louis, EBM formalized clinical decision-making through randomized controlled trials and meta-analysis (Sackett *et al*., 1996) [30]. This methodology replaced professional intuition with probabilistic reasoning, improving therapeutic consistency. Finally, the incorporation of psychology and sociology into health research expanded the meaning of wellness. The WHO's redefinition of health (1948) and the emergence of health psychology and social epidemiology reframed well-being as multidimensional. As Huber *et al*. (2011) [14] later proposed, health should be seen as "the ability to adapt and self-manage in the face of social, physical, and emotional challenges." This adaptive understanding laid the conceptual foundation for the holistic health paradigm.

Despite its triumphs, biomedicine generated a series of epistemic and ethical distortions. The biomedical model conceptualized the body as a machine and disease as a malfunction of its parts. While this enabled precision diagnosis, it fragmented the human experience. Illness became a technical defect rather than a lived narrative. Engel's (1977) [10] *biopsychosocial model* emerged precisely as a corrective, insisting that biological data alone cannot capture suffering, meaning, and context. The expanding

authority of medicine reclassified normal life events—birth, aging, grief, sexuality—as disorders requiring expert supervision (Conrad, 2007) [6]. The twentieth century witnessed the pharmacological management of emotions and attention, the pathologization of menopause and childhood behavior, and the institutionalization of death in hospitals. While these processes sometimes reduced suffering, they also diminished individual autonomy and cultural diversity in coping with life's transitions. The medical–industrial complex transformed healing into a market commodity. Pharmaceutical marketing shaped disease categories; insurance algorithms influenced clinical decisions; and health expenditures soared beyond sustainable limits. In the United States, the top 10 percent of patients now consume nearly 70 percent of total health costs (Dieleman *et al*., 2020) [9]. Globally, technological concentration has widened inequities: while proton-beam therapy and genomic sequencing flourish in high-income nations, 400 million people in low-income countries still lack basic primary care (WHO, 2019). Collectively, these distortions generated what Illich (1976) [15] called *iatrogenic society*—a condition in which medicine, by exceeding its moral and epistemic boundaries, undermines its original purpose.

The Return of Holistic Health: Reconstructing the Paradigm

From the 1970s onward, a counter-movement emerged across global health policy and medical thought: the *holistic turn*. Rather than rejecting science, it sought to complement biomedicine with psychosocial, environmental, and spiritual dimensions (Lu, 2022) [21]. The Alma-Ata Declaration (WHO & UNICEF, 1978) [38] inaugurated this paradigm shift by proclaiming *Primary Health Care* (PHC) as the cornerstone of "Health for All." It emphasized prevention, community participation, and social justice. In contrast to top-down technocratic programs, PHC framed health as a developmental and ethical enterprise. Subsequently, the Ottawa Charter for Health Promotion (WHO, 1986) [35] defined five strategies—healthy public policy, supportive environments, community action, personal skills, and reoriented services. This reframed health as a societal resource and positioned individuals and communities as active agents. Research over the following decades confirmed the Charter's impact: countries integrating health promotion into urban design and education (e.g., Sweden, Canada, Japan) reported measurable declines in chronic-disease risk and mental-health morbidity (Kickbusch, 2003; WHO, 2015) [17, 37]. The twenty-first century further advanced this logic through *sustainable-development frameworks*. The UN's *2030 Agenda* links health to equity, gender, and climate resilience (UN, 2015) [33]. In this view, medicine becomes one component of a larger ecosystem of social well-being.

Parallel to policy reform, new scientific disciplines reconnected physiology with psychology. *Psychoneuroimmunology (PNI)* demonstrated that stress, emotion, and immune function are biologically intertwined (Ader & Cohen, 1993) [1]. Herbert Benson's (1975) [3] *relaxation response* research provided empirical evidence that meditation and breathing exercises lower sympathetic activation and cortisol levels. Recent meta-analyses confirm that mindfulness-based interventions improve glycemic control, hypertension, and depression (Khoury *et al*., 2015; Goyal *et al*., 2014) [11, 16]. Integrative medicine emerged as an institutional response to this evidence. The U.S. National Center for Complementary and Integrative Health (NCCIH, 2022) now funds rigorous studies on acupuncture, yoga, and herbal pharmacology. Acupuncture's efficacy in chronic pain and nausea has been validated through Cochrane reviews (Vickers *et al*., 2018) [34], while plant-derived compounds such as artemisinin revolutionized malaria treatment (Tu, 2016) [32]. These developments demonstrate that traditional modalities can coexist with modern biomedicine when evaluated through transparent scientific methods. Clinically, integrative oncology, palliative care, and lifestyle medicine have become emblematic of this holistic ethos. Multidisciplinary teams—including physicians, psychologists, nutritionists, and spiritual counselors—address both disease and meaning. In doing so, they re-humanize medical practice and restore patient agency.

The digital revolution of the twenty-first century reconfigured the locus of medical authority once again. Wearable technologies and telemedicine enable continuous self-monitoring, transforming patients into active participants in health management. Real-time biosensors track heart rate, glucose, and sleep, while mobile apps deliver behavioral coaching. Studies show that users of activity trackers increase weekly physical activity by 20 percent and improve sleep quality by 15 percent (Kvedar *et al*., 2014) [19]. Tele-health platforms expanded dramatically during the COVID-19 pandemic, improving accessibility for rural and mobility-limited populations (Greenhalgh *et al*., 2020). Moreover, artificial-intelligence diagnostics now assist in early detection of cancers and retinopathies, narrowing gaps in specialist care. However, digital health also raises ethical questions—privacy, data ownership, and algorithmic bias—that echo earlier critiques of medicalization. The challenge is to ensure that digital empowerment does not devolve into digital surveillance. When balanced, technology can democratize health knowledge and operationalize the holistic ideal of *shared responsibility* among individuals, communities, and professionals.

Conclusion

The history of twentieth-century Western medicine is both a chronicle of triumph and a cautionary tale. From the clinical revolution to digital health, medicine's trajectory reflects humanity's quest to master life through reason and technology. Yet this same mastery risks eclipsing the ethical, cultural, and existential dimensions of healing. The biomedical paradigm succeeded because it offered clarity, precision, and control. It conquered contagion and extended longevity. But its epistemic architecture—mechanistic, reductionist, and

hierarchical—marginalized other ways of knowing. As health became institutionalized, patients became data points; as medicine became industrialized, health became a commodity.

The holistic paradigm, revived in the late twentieth century, does not reject science; it contextualizes it. By integrating biological, psychological, social, and environmental dimensions, holistic health restores the patient as a whole person embedded in relationships and ecosystems. Contemporary health policy and technology should therefore be guided by three principles. Firstly, Epistemic pluralism: acknowledging that biomedical evidence is necessary but not sufficient, and that qualitative, experiential, and indigenous knowledge contribute to a

fuller understanding of well-being (WHO, 2015) [37]. Secondly, Social responsibility: resisting the neo-liberal tendency to individualize health risk, and reaffirming the role of state and community in creating equitable living conditions (Marmot, 2020) [23]. Finally, Ethical humility: recognizing the limits of intervention and the inevitability of vulnerability, suffering, and death as aspects of human wholeness.

The future of medicine thus lies not in abandoning technology but in humanizing it. Genetic therapy, artificial intelligence, and precision medicine will undoubtedly transform clinical care, but without humanistic orientation, they risk deepening alienation. Conversely, health promotion, community empowerment, and integrative care embody a "post-biomedical paradigm" that reconciles efficiency with empathy (OpenAI, 2023) [25]. In the twenty-first century, *holistic health* should be understood as more than a wellness slogan. It is a moral framework for restoring balance between knowledge and compassion, autonomy and solidarity, innovation and justice. As this study concludes, the enduring task of medicine is not merely to cure disease but to sustain the dignity, coherence, and interconnectedness of life itself.

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