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Rethinking European Health Systems: Lessons from the Estonian Model about Physical–Psychological Health

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Abstract: This paper examines Estonia's health system through the lens of Bronfenbrenner's Ecological Model, analysing how physical and psychological health interact across individual, interpersonal, community, and societal levels within the country's sociopolitical, cultural, and digital contexts. It begins by outlining Estonia's historical transition from the Soviet Semashko model to its current Bismarck-type social health insurance system, highlighting the structural and ideological reforms that have shaped contemporary healthcare delivery, and demonstrates how extensive digitalisation, universal coverage, and a strong primary care system have contributed to notable public health achievements, including one of the lowest infant mortality rates in the European Union and high levels of system efficiency. Particular attention is given to Estonia's leadership in digital health innovation, including the implementation of e-Health systems and the X-Road data infrastructure, which have significantly enhanced accessibility, continuity of care, and patient safety. Despite these strengths, the paper identifies persistent challenges such as healthcare workforce shortages, regional disparities in service provision, and the pressures of an ageing population. The paper further argues that psychology remains underintegrated within the healthcare system, advocating for stronger legislative recognition of clinical and health psychologists, increased investment in training and workforce development, and the systematic integration of psychosocial care in chronic disease management, oncology, and geriatric services. Ultimately, the Estonian case illustrates how digitally enabled, preventive, and community-oriented approaches can inform more holistic and sustainable health system reforms in Portugal and other European contexts.

Keywords: Estonia; Health System; Psychology; Digital Health; Bronfenbrenner; Mental Health; European Health Policy; Primary Care

1. Introduction

Located in Northern Europe and bordered by the Gulf of Finland to the north, the Baltic Sea to the west, the Russian Federation to the east, and Latvia to the south, Estonia is one of the 27 member states of the European Union (EU). Its accession to the EU occurred on May 1, 2004, approximately thirteen years after its separation from the Union of Soviet Socialist Republics (USSR), a milestone that took place on August 20, 1991 [1].

This paper analyses Estonia's evolution from a broad perspective to understand how its physical and psychological health systems operate, the challenges they face, their most positive and negative aspects, and what lessons Portugal (situated in the south of Europe) might learn from this Baltic nation. Health will be examined through Bronfenbrenner's Ecological Model, which conceptualizes human development as the result of constant interaction between the individual and the multiple environmental contexts in which they are embedded, rather than viewing

the person in isolation [2].

To enhance conceptual clarity, it is essential to distinguish between clinical psychology and health psychology, as these domains serve complementary but distinct functions within the broader field of psychology. Clinical psychology is primarily concerned with the assessment and treatment of mental disorders, focusing on individuals experiencing significant psychological distress. In contrast, health psychology is oriented toward prevention, health promotion, and behavior change, addressing lifestyle factors such as diet, physical activity, and smoking, as well as the psychosocial determinants of physical illness. This distinction is particularly relevant in the context of non-communicable diseases, where behavior modification and early intervention play a critical role. By explicitly differentiating these domains, the present study not only strengthens its theoretical positioning but also highlights the need for greater integration of health psychologists in primary care and community settings, thereby supporting more effective and sustainable responses to public health challenges, including those observed in Estonia.

Bronfenbrenner [2] suggests that human behaviour is shaped by interrelated factors, such as personal, familial, institutional, community-based, and sociopolitical. He argues that human behavior develops within a system of four levels, starting with the microsystem, which is closest to the individual and encompasses direct interactions that have a significant impact on the individual. Next comes the mesosystem, which refers to interactions between the different microsystems, and later, the exosystem, which refers to environments that do not directly affect the individual but can still have an impact. In the case of a healthcare system, this last level can be exemplified by the country's accession to the European Union. The macrosystem examines how cultural and social influences, including norms, values, economics, culture, and politics, shape the environment in which individuals live. In other words, it is impossible to understand the individual without understanding the various systems in which humans live [2]. This perspective enables us to understand health as a systemic phenomenon, rather than a purely clinical one.

To strengthen the theoretical grounding of the present study, it is important to integrate Nola Pender's Health Promotion Model (HPM) as a complementary framework for understanding behavior change processes. While the manuscript identifies key behavioral risk factors, the inclusion of HPM provides a structured, evidence-based approach to explain how cognitive-perceptual variables—such as self-efficacy, perceived barriers, and perceived benefits—influence individuals' engagement in health-promoting behaviors. Importantly, this model extends and complements Urie Bronfenbrenner's ecological perspective by elucidating the internal psychological mechanisms that operate within broader social and environmental systems. By integrating these frameworks, the study gains both conceptual depth and practical relevance, offering clearer guidance for the design of prevention and health promotion interventions, particularly in applied contexts such as Estonia. Furthermore, this integration supports a necessary conceptual clarification between clinical interventions and health promotion strategies, reinforcing the distinction between treatment-oriented approaches and proactive, behavior-focused prevention efforts [3].

From an ecological perspective, the psychological effects of digitalisation cannot be understood exclusively at the individual level. Rather, they emerge through dynamic interactions between personal vulnerabilities, interpersonal relationships, institutional structures, and broader sociocultural and technological systems. This framework allows for a more integrated understanding of how digital environments simultaneously shape emotional regulation, identity construction, social belonging, and behavioral patterns across multiple levels of experience.

2. The Estonian Soviet Socialist Republic

To understand the current State of Estonia and its healthcare system, it is essential to examine the historical context that has shaped it. Thus, this section begins by analysing the period when Estonia was one of the fifteen Soviet Socialist Republics forming part of the USSR [4].

Under Soviet rule, the Semashko model was implemented as Estonia's healthcare model. The State was the sole financier and manager of healthcare, abolishing private initiative and establishing complete government control over the health sector. All healthcare funding originated from the state budget, and the Soviet central government made political decisions in Moscow. The Estonian Ministry of Health was responsible for executing these plans, allocating resources (both financial and human), and constructing hospitals and health centers [4].

The Semashko model promoted universal and free access to healthcare services, offering broad coverage intended to reach the entire population. It led to the construction of numerous hospitals and clinics across the country, often without considering real demand, revealing poor planning. The policy required at least one hospital per ad-

ministrative district and one medical post per village, which created significant discrepancies between the quantity and quality of services. This emphasis on quantity over quality reflected the ideological nature of the regime, where numerical indicators were considered signs of success. Consequently, physicians were evaluated based on the number of procedures performed rather than their clinical outcomes. Thus, during the Soviet period, Estonia's physical healthcare system was primarily oriented toward disease treatment and secondary care [4].

In mental health, Estonia followed the broader Soviet approach: universal and free access, but with a strictly biomedical focus and dominated by institutional psychiatry. The role of psychologists was virtually non-existent, as mental health care prioritised hospitalisation and pharmacological treatment. At the same time, psychotherapy was considered secondary in addressing mental disorders, something due to the regime's control over mental health practices, which favoured standardisation and isolation from Western approaches. Moreover, psychiatry was often used to silence political opponents of the regime. Arbitrary diagnoses of various psychopathologies, such as schizophrenia, were used to hospitalize the person, revealing that mental health in the USSR could also be used as a form of oppression [4].

3. The Transition from 1991 to 2004

Following independence in 1991, Estonia faced significant population decline due to intense emigration (particularly of Russian speakers to Russia and young citizens to Western Europe), a decline in birth rates, and an ageing population. Citizenship and integration tensions also emerged, especially among Russian-speaking minorities due to the fall of the USSR [5].

The post-Cold War reality presented new challenges, including the loss of Soviet markets, skyrocketing inflation, and sudden unemployment, which compelled Estonia to abandon the ruble and reintroduce its own currency, the Estonian kroon. These factors severely weakened social institutions, such as healthcare, education, and social security, which were inherited from outdated Soviet infrastructures. The new government had to respond swiftly and effectively [6].

Estonia implemented neoliberal reforms, including the privatisation of enterprises and services, liberalisation of trade and prices, and the introduction of a flat tax of 26% (later reduced), which attracted significant foreign investment, particularly in the technology and banking sectors. The Estonian Kroon was pegged to the German mark (and later to the Euro), which led to greater confidence in investing in the economy and consequently led to a reduction in inflation. Furthermore, at a geopolitical level, it represented Estonia's break with Russia and a closer relationship with Germany and the European Union [7].

Healthcare also underwent major reform. In 1991, Estonia established the Estonian Health Insurance Fund (EHIF), laying the groundwork for a national social insurance system modeled after the Bismarck Model. The reform included reducing and modernising hospitals, which led to, in the following three decades, that is, until today, only half of the hospitals remaining [4]. However, the remaining hospitals are well distributed, with 94% of the population living within a thirty-minute drive of a hospital [8].

During this period, Estonia began to recognise clinical psychology as a scientific field and as a profession, shifting from institutional psychiatry to community-based psychiatry [9].

After joining the European Union, Estonia aligned its development policies with EU principles and its own post-Soviet reforms, including the adoption of the Euro on January 1, 2011. It marked a continued cultural and institutional shift toward the West [4].

4. The Current Estonia: Economic and Sociodemographic: Overview

As of 2023, Estonia's population stood at approximately 1,367,196 inhabitants. The World Health Organization forecasts a 14% decline by 2050. Approximately 23.1% of the population is aged 65 and above (the retirement age in Estonia), while only 7.2% are under 14, indicating an ageing demographic [10]. Roughly one-third of the population resides in the capital, Tallinn (456,518 inhabitants), followed by Tartu (100,685 inhabitants), demonstrating an uneven population distribution across a territory of around 45,000 km^2, comparable in size to Slovakia or half of Portugal's total land area [11,12]. Estonia also holds the lowest infant mortality rate in the European Union, with 1.6 deaths per 1,000 live births [13].

Despite its small population, Estonia has a GDP (Gross Domestic Product) of near USD 41.5 billion, translating

to a per capita GDP of USD 30,219 [14]. The average life expectancy is 79.6 years (83.7 for women and 75.1 for men) [15], and the mean years of schooling is 13.6 years, contributing to a very high Human Development Index (HDI) of 0.905, placing it 36th worldwide [15]. In comparison, Portugal has an HDI of 0.890 (40th worldwide), with slightly lower mean years of schooling (9.7 years) [16] and GDP per capita (USD 28,844.50) [17]. Meanwhile, the average life expectancy is the only criterion by which Portugal surpasses Estonia (81.5 years, 78.7 for men and 84 for women) [15]. Furthermore, it is worth mentioning that in Estonia, 38% of the population has a higher education degree, 42.2% have completed secondary education, while 19.2% have completed primary education, with 0.6% being unknown [18].

In terms of safety, Estonia ranks 24th globally on the Global Peace Index, behind Spain [19]. In 2022, the homicide rate was 1.48 per 100,000 inhabitants, a value like Luxembourg's (1.53) but higher than Portugal's (0.72) [20]. However, in 2023, according to the Safety Perception Index, Estonians are among the people with the highest perception of security in relation to their country [20].

Estonia's transport infrastructure is modern in urban centres such as Tallinn, but rural areas remain less developed. The country faces growing air and noise pollution due to the expansion of industrial activity and increasing road traffic. However, waste management has improved significantly, with an increase in recycling and a decrease in landfill disposal over time [21].

5. Estonia's Health System

The rights of Estonian citizens are enshrined in the national constitution, which states in Article 28 that everyone has the right to health protection [22]. This provision places upon the State the duty to ensure social assistance in cases of need, such as old age, disability, or unemployment, and to promote public welfare and healthcare services. In practical terms, Estonia invests approximately 7.5% of its GDP in healthcare, with 1.2% of the GDP allocated to pharmaceuticals [8].

Estonia operates a public healthcare system based on a social health insurance model (Bismarck-type). It is centred on a single national fund, the Estonian Health Insurance Fund (Haigekassa), which manages most public resources and contracts health service providers. However, Estonia also contributes public funding to ensure more universal access to the system, allowing children, the elderly, and those in vulnerable conditions to access the health system free of charge. This combination of social insurance and the national fund creates a mixed health system. Contributions to the Haigekassa fund come primarily from a 13% payroll tax paid by employers, supplemented by government transfers (including 13% from pension income), ensuring coverage for roughly 94% of the population [23].

The Ministry of Social Affairs coordinates the system. All major hospitals are public institutions providing both inpatient and specialised outpatient care, while private providers contracted by the fund manage most primary healthcare centres and dental services. Access to healthcare is primarily through family physicians working in these centres, whose services are free for insured patients, with little or no copayment in most cases [8,24].

However, the benefits package does not cover over-the-counter medicines, ophthalmology services, adult dental care beyond the basic package, or many orthodontic procedures. Outpatient medicines, especially over-the-counter medications, are the largest source of out-of-pocket expenses for households, followed by dental care, inpatient nursing services, and other medical products such as eyeglasses, hearing aids, and orthopaedic devices. Copayments apply to all specialist consultations except for primary care, with exemptions for children under two, pregnant women, and patients referred for hospitalisation [8,24].

Access to mental healthcare is also covered by the public insurance system (Haigekassa). At the primary level, patients start at their local health or family centre, with no direct costs, and then family doctors should refer to a mental health professional. Since 2015, a therapy fund has been established to provide universal access to therapy sessions for insured individuals, including those with clinical psychologists. As of 2025, psychology (clinical and counselling) and physiotherapy consultations are funded only when the health centre employs the professional and remain free for the patient. If the centre lacks a psychologist, the physician may refer the patient to a contracted professional, whose services are also fully covered by the insurance fund [24].

Secondary and community-level mental health services are equally accessible to insured citizens. These include outpatient psychiatry in regional hospitals and specialized clinics. Community mental health services for children and adolescents, staffed by psychiatric nurses, clinical psychologists, and social workers, are also offered by

the region of residence. Municipalities have increasingly invested in community-based mental health programmes, hiring local psychologists and expanding subsidies to reduce patient copayments. In 2025, a permanent national fund was created to support municipalities in developing autonomous mental health promotion and support services [24].

In times of crisis, emergency psychiatric care is available free of charge, 24 h a day, in major cities. Hotlines and online portals also provide immediate psychological support and triage. In summary, Estonia ensures broad public coverage and accessibility of mental health services, supported by robust primary care and community-based structures [25]. Nonetheless, challenges persist in some regions, particularly regarding specialist shortages and waiting times for psychiatric consultations [8].

Despite its strengths, the European Observatory on Health Systems and Policies and the Organisation for Economic Co-operation and Development (OECD) have raised concerns about the long-term financial sustainability of Estonia's healthcare system, due to its declining working-age population and the rise in flexible employment arrangements, which may cause some people to be left uninsured and discourage immigration [8].

6. The Low Infant Mortality Rate

As noted earlier, Estonia has the lowest infant mortality rate in the EU, a result of several interrelated factors like free healthcare access for pregnant women and children, an efficient network of primary care, which allows physicians to provide continuous monitoring and detect early complications, and technologically advanced hospitals with high-quality obstetric and neonatal practices, all of which contribute to this outcome [26].

High literacy in child education, regular and free prenatal check-ups, births assisted by qualified professionals, and postnatal support programs, including home visits from nurses and early pediatric follow-up, also play crucial roles. Universal vaccination programmes and strict infection control standards complement these efforts [8,27].

Another major factor lies in family policies. Estonia offers extensive and well-paid parental leave: mothers are entitled to 100 days of maternity leave, followed by an additional 475 days of shared parental benefit, which both parents can take simultaneously for up to 60 days. Payment equals 100% of average earnings over the previous year, with a guaranteed minimum equal to the national minimum wage [26].

Digitalisation also plays a pivotal role. Parental leave requests are digital, with almost no bureaucracy. There are telemedicine programs, digital triage, and entirely electronic medical records, enabling real-time monitoring, automatic alerts, and coordinated care across various services. It helps prevent complications with complete digital security [26].

It reflects the broader digital culture embedded in Estonian society. Services such as electronic records, tax filing, and online and electronic voting allow 99% of public services to be digitally accessible [27]. Data exchange is guaranteed by the national "X-Road" platform, which securely connects hundreds of public and private databases. It is worth noting that X-Road consists of a system that connects the databases of public and private entities (such as ministries, hospitals, banks, schools, etc.). Instead of having a central database, each institution maintains its data locally, with X-Road enabling end-to-end encrypted and authenticated communication, meaning data does not circulate freely across the network [28]. X-Road is recorded in a public and immutable log, which allows tracking of who accessed it, when, and for what purpose. Although it may seem bureaucratic, X-Road allows immediate access to essential clinical data through the e-Health system, with this information being shared within seconds. In practice, the healthcare professional must connect to the National Health Portal [28]. The system validates the professional's identity using a digital ID or medical smart card. The request is encrypted and authenticated by X-Road, which verifies legal authorization for access. After access, the request is recorded. It is possible to use blockchain technology, which is used to protect medical and legal records against tampering. It means that each time someone accesses or changes a record (for example, a doctor consults your health history or adds a test), the system creates a unique "digital signature" for that event [28]. This signature is stored in a blockchain, which functions as an immutable ledger. If someone attempts to modify the data later (for example, deleting a diagnosis or changing a date), the signature would no longer match, and the system would immediately detect the manipulation [29].

In terms of cybersecurity, all access requires strong authentication with a digital citizen card or Mobile ID. Only doctors with a proven clinical relationship can view a patient's medical file. Each patient can hide certain records (such as mental or sexual health consultations) through the portal [29].

Furthermore, Estonia adopts the European principle of "data minimization", collecting and processing only

the data strictly necessary for the service provided. There are also sovereign data embassies located outside the national territory, operated under Estonian jurisdiction. They serve to guarantee the continuity of the digital State in the event of a cyberattack, natural disaster, or armed conflict. They contain secure copies of critical databases (such as population, health, and justice registries) using cloud technology [29].

Other notable innovations include e-Prescription, e-Ambulance and telemedicine platforms [27]. The first one consists of an electronic prescription system. It has been in effect since 2010, and since then, doctors have been writing only electronic prescriptions, and pharmacists can access them using the patient's ID card. It reduces trips to the doctor, and renovations can be requested by email or phone call, depending on the assessment made by the doctor [29].

The second one, e-Ambulance, is a system that locates the source of emergency calls in 30 s and quickly dispatches ambulances. In the ambulance, the doctor can access critical patient data in real-time (blood type, allergies, current medications, pregnancy status, etc.) using the patient's ID code. 99% of the population already has access to digital medical records [29].

Regarding telemedicine, platforms such as MinuDoc and Viveo Health have created secure virtual consultations. At the peak of the pandemic (2020), about 40% of medical consultations were conducted online, thanks to the rapid adoption of these solutions by clinics. For example, Viveo Health (considerate something "like a Zoom for healthcare") registered more than 800 doctors using the system in just two days. These services are continually maintained and expanding, particularly in primary care and chronic disease management. According to the Health Authority, telemedicine was primarily designed for primary care, but remote monitoring programs for cardiac and other patients are now advancing [30].

7. The Most Common Physical Diseases in Estonia

According to OECD (Organisation for Economic Co-operation and Development) data, the leading cause of death in Estonia stems from circulatory system diseases (49.1%), primarily ischaemic heart disease (13.5%). The second major cause is cancer (23.2%), with lung cancer (3.9%) being the most fatal, followed by colorectal (2.7%), breast and stomach (1.7% each), and prostate cancer (1.5%) [8].

External causes (6,2%) rank third, particularly suicide, responsible for 1.4% of deaths in 2020. Diseases of the digestive system are next (4.9%), followed by respiratory diseases (3.3%), such as pneumonia (1.6%) and chronic obstructive pulmonary disease (1.1%). Diabetes, dementia (1.4%), and COVID-19 (1.3%) complete the top causes of mortality [8].

The Institute for Health Metrics and Evaluation (IHME) estimates that 39% of deaths are linked to modifiable behavioural factors: 18% to dietary risks, 15% to tobacco use, 8% to alcohol consumption, 2% to low physical activity, and 1% to air pollution. Over 20% of adults smoke daily, and 50% are overweight. In response, the government has implemented food reformulation programmes and advertising restrictions aimed at promoting healthier habits among children and adolescents [8].

Health disparities persist between socioeconomic groups. Individuals with lower educational levels tend to smoke more, exercise less, and consume fewer fruits and vegetables. Only 34% of low-income Estonians perceive their health as good, compared with 78% among higher-income groups [8].

8. The National Health Plan

Since 2008, Estonia's National Health Plan has guided strategic health policy and budget planning, fostering multidisciplinary collaboration and setting key priorities. The most recent plan (2020–2030) aims to continue improving life expectancy and healthy life years, while reducing health inequalities across gender, regions, and educational levels [23].

In mental health, the plan includes the Mental Health Action Plan 2023–2026, developed by the Ministry of Social Affairs with broad stakeholder consultation. It defines five strategic lines of intervention highlighting: development and innovation, that support creating new assessment tools and monitoring systems avoiding healthcare overload; promotion and prevention, focusing specially on suicide prevention and reducing stigma associated with mental healthcare; community support, that refers to integrating mental health policies with employment and social inclusion efforts, including measures to combat loneliness; service improvement, ensuring equitable access,

clarifying care pathways, and reinforcing the mental health workforce; and Psychosocial crisis management, improving coordination and training for first responders [8].

Additionally, the country launched its first Suicide Prevention Plan (2025–2030), along with other initiatives aimed at reducing violence. Moreover, Estonia participates in international mental health initiatives, such as the Pan-European Mental Health Coalition [23,31,32].

Furthermore, Estonia also adopted the National e-Health Strategy 2025–2030 for mental and physical health. This project prioritizes higher data quality and security, full system interoperability, the use of artificial intelligence in clinical decision-making, and greater citizen participation in managing personal health data, aiming to make the health system more effective and promote individual involvement in the clinical process [33].

9. Challenges of the Estonian Health System

Despite remarkable progress, Estonia's National Health Service faces significant challenges. A large proportion of people over 65 live with functional limitations (31% of women and 24% of men). The country struggles with long waiting lists and shortages of doctors, nurses, and psychiatrists. Nearly 46% of physicians are over 55, raising concerns about the need for workforce renewal. The shortage is general to almost all specialties, which makes skill-mix solutions, such as task shifting, unfeasible to overcome health workforce shortages, likely to challenge the resilience of the health system [8].

Training rates for healthcare professionals remain insufficient to meet demand. Moreover, health insurance eligibility is still tied to employment or pensioner status. Those without insurance, including informal workers, have access only to emergency care, cancer screening, and particular services for infectious diseases, leaving gaps in primary care and coverage for essential medicines [8].

Regarding mental health, in 2023, 16% of Estonians had been diagnosed with a mental disorder, a figure close to the European average (17%). Furthermore, in 2022, one in four adults was at risk of depression, and one in five was at risk of generalised anxiety disorder. Depression remains the most common diagnosis, followed by anxiety and substance use disorders [8].

The economic cost of mental illness in Estonia reached 2.8% of GDP (EUR 572 million) in 2015, compared to an EU average of 4.1%. Mental healthcare is provided by family doctors, nurses, psychiatrists, psychiatric nurses, and clinical psychologists [8].

Despite advances, Estonia still faces challenges in psychology, such as the number of clinical psychologists in training remaining far below projected needs and the associated costs of specialization in psychology. For example, currently, there are fewer than 50 child clinical psychologists in the entire country, highlighting an urgent need to expand training and workforce capacity [34]. Also, Estonia follows the European Psychologist framework for psychologist training [35,36].

10. What Can Be Done for Better

One of the most evident weaknesses in the Estonian health system concerns the limited presence of psychologists [8]. This analysis, therefore, argues for the creation of legislation that recognises and promotes the inclusion of clinical psychologists within healthcare services. The literature demonstrates the importance of these professionals across multiple dimensions that can strengthen Estonia's health outcomes, from promoting healthy lifestyle habits to their crucial role in treating oncological diseases [37].

Firstly, multidisciplinary team meetings (MDTMs) are considered best practice in the management and decision-making process for cancer patients. These teams typically include surgeons, oncologists, organ specialists, radiologists, pathologists, and, in some cases, specialist nurses and psychologists. However, research consistently shows that these MDTMs are predominantly driven by physicians, with minimal participation from oncologists and other non-medical professionals. As a result, decisions often rely almost exclusively on biomedical information, neglecting psychosocial dimensions that could meaningfully influence patient care [37].

Another article [36] emphasizes the role of psychology as a key factor in modifying behavioral factors, such as dietary risk or tobacco consumption, by creating opportunities and support, listening to and engaging with populations, expanding capacities, and managing motivation and expectations, while optimizing and monetizing available resources. It not only allows for the prevention of risky behaviours but also promotes healthy lifestyle choices,

resulting in healthier years [36]. The proven effectiveness of cognitive-behavioural therapy (CBT) in modifying behaviour further reinforces this point; however, this therapy has also proven important in aspects such as promoting quality of life. It can help help a person cope with stressful situations, such as a cancer diagnosis, or in helping them adapt their limitations (which may arise throughout life) to the demands of everyday life, perfectly demonstrating the importance of psychology in improving quality of life, promoting physical and mental health, and even helping people adapt to the realities that aging and chronic illness can bring [38].

In addition to traditional CBT, third-wave approaches such as Acceptance and Commitment Therapy (ACT) and mindfulness-based interventions have shown strong efficacy in promoting psychological flexibility and improving adaptation to chronic illness. While traditional cognitive-behavioral therapy (CBT) remains a well-established and effective intervention, contemporary evidence highlights the growing relevance of third-wave cognitive-behavioral approaches, particularly in the context of chronic disease and long-term health conditions. Approaches such as Acceptance and Commitment Therapy (ACT) and mindfulness-based interventions emphasize psychological flexibility, acceptance, and present-moment awareness, rather than solely focusing on symptom reduction.

In this context, third-wave psychotherapies offer particularly relevant frameworks for addressing the psychological challenges associated with digitally mediated environments. Rather than focusing exclusively on symptom reduction, these approaches emphasize emotional regulation, psychological flexibility, mindfulness, self-compassion, and values-oriented behavior. Consequently, they may provide important therapeutic tools for responding to difficulties increasingly associated with digitalisation, including experiential avoidance, emotional fragmentation, compulsive comparison, and dependency on external validation.

These approaches are especially pertinent in the management of chronic conditions—such as cancer, cardiovascular disease, and chronic obstructive pulmonary disease—where complete symptom elimination is often not feasible. In such contexts, fostering adaptive coping, values-based action, and acceptance of internal experiences becomes central to improving quality of life and psychological well-being. Evidence suggests that ACT, in particular, is effective in promoting behavioral change and emotional regulation, while mindfulness-based interventions contribute to reductions in stress, anxiety, and pain-related distress. For example, Acceptance and Commitment Therapy (ACT) may help individuals develop psychological flexibility in response to constant social comparison and performance pressures online. Dialectical Behavior Therapy (DBT) offers strategies for emotional regulation and distress tolerance in contexts characterized by impulsive digital engagement and emotional overstimulation. Similarly, mindfulness-based approaches may support the development of greater attentional control and self-awareness in increasingly fragmented digital environments.

From a health psychology perspective, integrating these third-wave approaches into prevention and intervention programs offers a more flexible and person-centered framework, aligning with the complex and multifactorial nature of non-communicable diseases. Their inclusion strengthens the manuscript's clinical relevance and ensures alignment with current evidence-based practices in psychological care.

Beyond recognising and protecting the role of psychologists, another measure to improve Estonia's healthcare system should involve state support for the training and specialisation of psychologists. As previously analysed, advanced training in psychology can be costly, discouraging professional development and limiting the quality of services, a situation that ultimately harms the system's performance [34].

Situations like prostate cancer diagnosis [39] reveal that men rarely address topics such as rectal examinations, diagnosis, psychological challenges, erectile dysfunction, or fear of death, which, in Estonia, represents one of the leading causes of mortality. This avoidance reflects deeper cultural and psychological factors within Estonian society. The stigma surrounding mental health and seeking psychological help may represent a systemic failure in addressing men's psychosocial needs, potentially resulting in distress and anxiety symptoms that compromise quality of life [39].

Similarly, the urgent need to prepare for an ageing society with multiple chronic conditions should be a preoccupation for the Estonian government, a trend already identified by the OECD [8]. This demographic shift will increase the relevance of informal caregivers, whose role will become vital in supporting the elderly population. Thus, state initiatives to support informal caregivers and mitigate stress are essential. Moreover, addressing the well-being of older adults is crucial to ensuring population health, social cohesion, and improving the quality of life for this group of people [40].

Some studies show the psychologist's critical role in preventing and managing comorbidities associated with

chronic illnesses [41]. Psychological intervention can help patients adopt healthier lifestyles, improve treatment adherence, and manage the emotional burden associated with long-term diseases [41].

The OECD also highlights the importance of renewing the healthcare workforce. Estonia currently faces an ageing pool of professionals, with shortages of doctors and nurses that could pose significant problems in the near future. This reality calls for proactive planning to attract, train, and retain healthcare workers [8].

Estonia's strong use of digitalisation provides exceptional opportunities to demonstrate how humanisation in healthcare and technological innovation can coexist. Recent advances have enabled more agile services, improved diagnostic accuracy, and increased time for empathetic care. Technology in mental health should therefore prioritise sector-wide improvements and contribute to a more dignified, just, and sustainable society. The challenges of living longer and maintaining health call for new integrations of psychology and technology, an idea reflected in the concept of Health 4.0, which promotes the use of digital tools to prevent disease and enhance physical and psychological well-being. Telepsychology emerges as a natural evolution of mental healthcare in the digital world [42,43]. By merging Estonia's digital leadership with innovative therapeutic practices, the country can expand access to mental health support while reducing regional disparities.

Although digital technologies have expanded access to information, communication, and mental health resources, their psychosocial consequences require critical examination. Contemporary digital environments are not neutral spaces; rather, they are structured through attention-based economies and algorithmic systems designed to maximize engagement. As a result, emotionally charged content, social comparison dynamics, and validation-seeking behaviors may become amplified, particularly among psychologically vulnerable individuals. These processes may contribute to emotional dysregulation, identity instability, compulsive online engagement, and increased interpersonal insecurity.

Digital platforms also promote increasingly performative forms of identity construction, in which self-worth becomes strongly associated with visibility, external validation, and social approval metrics. Within this context, individuals may experience growing pressure to maintain curated online identities, often leading to discrepancies between authentic self-perception and digitally mediated self-presentation. Such dynamics may intensify feelings of inadequacy, social anxiety, and relational disconnection, particularly among younger populations navigating identity-sensitive developmental stages.

Another area of concern is the absence of national guidelines for geriatric oncology. Estonia currently relies on general National Comprehensive Cancer Network (NCCN) guidelines, including those related to Older Adult Oncology, which are not always clearly adapted to local contexts. Countries such as Cyprus and Slovakia face similar issues due to the absence of domestic protocols. Therefore, developing national oncology guidelines tailored to Estonia's demographic and health-specific needs would have a tangible impact on improving cancer treatment outcomes [44].

11. Mental Health Services for the Aging Population

A significant gap in the current analysis concerns the mental health needs of the aging population, particularly given that a substantial proportion of Estonia's population is aged 65 and over. Older adults are disproportionately affected by complex psychosocial challenges, including depression comorbid with chronic illness, bereavement, social isolation, and increased caregiver dependency. Despite this, mental health strategies often remain underdeveloped for this demographic, with a predominant focus on younger and working-age populations.

Addressing this gap requires a shift toward integrated and age-sensitive mental health services. Psychogeriatric care should be strengthened through the integration of mental health support within primary care and community health services, ensuring early identification and intervention for depression, cognitive decline, and adjustment difficulties. In addition, community-based support groups can play a crucial role in reducing social isolation and promoting emotional well-being, particularly for individuals experiencing loss or functional limitations.

Equally important is the recognition of caregiver burden [38,41], which represents a significant yet often overlooked public health issue. The development of national caregiver support programs, including psychoeducation and psychological support, would not only improve caregiver well-being but also enhance the quality of care provided to older adults.

From a health psychology perspective, preventive interventions should be prioritized, focusing on maintaining autonomy, promoting active aging, and supporting adaptive coping strategies [35, 37]. Digital tools and hybrid

care models may also offer innovative solutions to increase accessibility, particularly for individuals with mobility constraints.

Incorporating targeted mental health strategies for older adults is essential for a comprehensive and equitable public health response, aligning with demographic realities and addressing the growing burden of non-communicable diseases in aging populations.

Universities should implement mandatory digital emotional literacy modules within health and social science curricula; Mental health services should incorporate screening protocols addressing problematic digital engagement and online relational dependency; Policymakers should encourage regulation requiring greater transparency in recommendation algorithms targeting vulnerable youth populations; Professional training programs should include competencies related to digital relational dynamics and online identity processes.

12. Comparative Analysis with Portugal

Estonia's ability to respond effectively to crises, particularly during the COVID-19 pandemic, distinguishes it from other nations. In 2020, COVID-19 accounted for 1.3% of total deaths in Estonia [8], compared to 5.8% in Portugal [45]. Estonia successfully maintained sufficient hospital capacity and avoided system overload, illustrating the importance of strategic infrastructure planning. The number of hospitals has halved over the past three decades, yet 94% of the population lives within a 30-min drive of a hospital, demonstrating effective spatial distribution. This factor could be important to implement in Portugal [8]. Additionally, integrating systems like X-Road, Estonia's digital data exchange platform, could significantly enhance Portugal's healthcare coordination and responsiveness, thereby reducing bureaucracy.

Estonia's mixed but highly centralised model demonstrates the benefits of strong coordination between public and private sectors. This integration mitigates service overload and ensures consistent quality. In Portugal, private healthcare often exacerbates inequality in access and quality, placing additional pressure on the public system [45]. Estonia's insurance-based structure and contractual partnerships with private providers, however, foster complementarity rather than competition, enhancing efficiency and accessibility.

13. Conclusions

This paper presented an analytical overview of Estonia's health system, shedding light on key aspects of its organisation and challenges. Overall, the country's digitalisation, infrastructure network, low antimicrobial resistance, and system resilience stand as lessons for Portugal and other EU members. However, some weaknesses persist, particularly regarding the current status of psychology in healthcare and mental health approaches.

It is acknowledged that this analysis has certain limitations, including the limited exploration of how Estonia's culture and climate impact physical and mental health, as well as the lack of examination of public attitudes toward psychology, which would help determine the need for greater awareness and education.

Future research should therefore investigate how cultural and environmental factors shape health in Estonia and assess the psychological and social impact of the ongoing war between Russia and Ukraine on the population's mental well-being.

We also highlight the need for empirical validation of the Health Promotion Model (HPM) within the Estonian digital health context, as well as the importance of conducting trials of Acceptance and Commitment Therapy (ACT) for individuals with chronic illnesses. Additionally, we emphasize the relevance of a comprehensive needs assessment addressing older adults' mental health, and the investigation of culturally adapted psychological interventions tailored to Estonia's diverse population, including Russian-speaking minorities.

Ultimately, digitalisation should not be understood solely as a technological transformation, but as a profound psychosocial reconfiguration affecting identity, emotional functioning, interpersonal relationships, and institutional practices. A critical and ecologically informed perspective is therefore essential for understanding both the risks and the therapeutic possibilities emerging within contemporary digital societies.

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Conceptualization, L.S.; methodology, T.C.; software, T.C.; validation, L.S.; formal analysis, L.S. and T.C.; investigation, L.S. and T.C.; resources, T.C.; data curation, L.S.; writing—original draft preparation, L.S. and T.C.; writing—

review and editing, L.S.; visualization, L.S.; supervision, L.S.; project administration, L.S. Both authors have read and agreed to the published version of the manuscript.

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