



Mapping policies related to problematic usage of the internet in seven European countries: Netherlands, Spain, Hungary, Lithuania, Portugal, Estonia and Switzerland[☆]

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ABSTRACT

This work presents a policy analysis regarding Problematic Usage of the Internet (PUI) across seven countries (Netherlands, Spain, Hungary, Lithuania, Portugal, Estonia, and Switzerland) belonging to or associated with the European Union (EU). It examines legislative instruments addressing PUI and its multifaceted impacts on society, including social, economic, and political dimensions. Despite the growing prevalence of PUI, particularly among adolescents, and its association with various mental health concerns, the study reveals a notable gap in direct policy interventions targeting PUI within these countries. Existing regulations largely focus on broader digital governance issues like data protection, cybersecurity, and market regulation, offering only indirect approaches to mitigating PUI's adverse effects. Our findings highlight a pressing need for innovative policy frameworks that incorporate mental health considerations into digital governance, promoting a balanced approach that fosters market innovation while ensuring robust public health protections. Building on the policy discourse examined in this study, future research should focus on developing targeted, multidimensional strategies to mitigate the risks associated with problematic internet use (PUI), with particular emphasis on safeguarding the well-being of vulnerable populations.

1. Introduction

Digital technologies have radically transformed the landscape of human interaction, bringing about profound benefits and significant challenges [1]. Among these challenges, problematic usage of the internet (PUI) stands out as a growing public health concern, characterised by maladaptive online behaviours that lead to important functional impairments [2]. PUI represents a broad spectrum of online behavioral patterns involving gaming, social networking, streaming, gambling, shopping, pornography consumption, cyberbullying, and victimisation, among others. It operates as a system that collectively impacts health, social, personal, and academic spheres, diminishing overall quality of life [3]. Despite including a diverse set of online activities, PUI-related behaviours have similar underlying mechanisms such as difficulties with regulating emotions and impulsivity [4,5]. These shared features suggest that the grouping of problematic behaviours under the term PUI can aid in addressing them more effectively, than viewing the activities as isolated maladaptive behaviours. PUI engagement is dynamic, and incorporates the digital sphere, social influence, and individual use (algorithm-driven) interactions which collectively shape a distinctive digital phenomenon [3,6,7]. This interconnectedness exposes individuals not only to vast digital realms, but also to sophisticated algorithmic mechanisms and novel forms of human interaction, often perpetuating the pervasive nature of the digital world in contemporary society [8].

The rapid evolution of social media further complicates this landscape, particularly for young people who are highly susceptible to its

influence. The constant emergence of new platforms, viral trends, and AI-driven content recommendations promotes prolonged engagement and habitual usage, increasing exposure to risks such as cyberbullying, social comparison, and algorithmic reinforcement of maladaptive behaviours. A positive correlation has also been found between social media use and body image and eating disorders, low self-esteem and the use of substances to boost image and performance, which can heighten compulsive use and blur the boundaries between online and offline life [9]. Similar developments were observed in gambling, where the shift to online platforms evades existing legislation, calling for more comprehensive policies to prevent increasing harms for public health [10].

The multifaceted disruptive impact of PUI is a growing phenomenon, leading to poor mental health [11], as well as having broader societal implications involving social disruptions, healthcare challenges, and economic burdens [12]. The cost burden of problematic use of the internet is high given that it relates to various dimensions including mental and physical health, social functioning, productivity loss, brain development, and unsafe use associated with accidents [13]. Recent estimates suggest that up to 25% of the global population experiences some form of PUI, with higher prevalence estimates in lower and lower-middle-income countries [14]. In this context, adolescents emerge as a particularly vulnerable group, given their proximity to digital spaces and a neurodevelopmental phase marked by significant physical, emotional, and social transitions, amplifying susceptibility to various mental health challenges, including PUI [15; 1]. PUI is associated with various psychiatric disorders (e.g., attention deficit, depressive, eating, and anxiety disorders) [15]. PUI can both result from and contribute to

various social and psychological issues, leading to complex negative consequences in daily life and extending its impact to social, economic, and political domains [16]. Factors that may predict PUI include low perseverance, heightened impulsivity (positive urgency), social anxiety and depression [17].

Previous work has suggested that PUI emerges from the interplay between individual mental and physical states, cognitive processes, and specific characteristics of the digital environment influenced by social and commercial determinants [6]. These digital attributes, fostering positive reinforcement, may induce patterns of uncontrolled and repetitive internet usage, culminating in rewarding cues detrimental to individual, relational, social, and economic well-being. While there are some regulations that address certain dimensions of digital and internet governance, as well as mental health, there are no legal instruments that explicitly address PUI at the European level [3]. There have been advances, such as the Digital Services Act (DSA), aiming to create a more secure digital world. However, this measure fails to specifically address PUI. This demonstrates that currently PUI is a construct based in research rather than in law. Therefore, this study refers to PUI as a framework to examine the online behaviours that compose PUI. This approach aims to bridge the existing gap between research and policy targeting harms related to online behaviours.

This narrow health mandate of the EU may skew the ability to directly address PUI, leaving pertinent legislation to be formed at a national level. As such, this study aims to systematically map and analyse the policy landscape related to PUI in a sample of seven European countries: the Netherlands, Spain, Hungary, Lithuania, Portugal, Estonia and Switzerland. It seeks to contribute to a nuanced understanding within the EU context, exploring the regulatory role as well as the social macro, *meso* and micro effects of policies related to PUI, and the possible prevention, protection, treatment, and mitigation of the risks associated with PUI in those seven countries.

2. Methodology

This research employs a policy path dependency approach to examine the evolution and impact of legal instruments on PUI on selected countries [18]. Countries were chosen using convenience sampling [19], though they represent a mix of different political organisations, including members of the EU (Spain, the Netherlands, Hungary, Lithuania, Portugal, Estonia), the Schengen area (Switzerland, the Netherlands, Spain, Hungary, Lithuania, Portugal, Estonia) or the European Free Trade Association (EFTA)(Switzerland), and National Health Systems (Private Health Insurance: Netherlands and Switzerland / Social Health Insurance: Estonia / National Health System: Spain, Portugal, Lithuania and Hungary). The selection also considers factors such as country size, economic status, geographic location, and levels of digital maturity [20]. Digital maturity differs in the selected countries regarding internet access and digital skills, due to socioeconomic factors and living situations. Geographically, the differences between the selected countries can be roughly classified into north-west and south-east.

This method allows for an understanding of how historical decisions influence current policy frameworks and their effectiveness in addressing a complex phenomenon [21], in this case, PUI. The methodology of policy path dependency involves an analysis of the pathways of policies shaped by antecedent legislations, pivotal moments, and the socio-political dynamics that underlie policy progression. Embracing this approach not only facilitates the assimilation of diverse viewpoints, often characterised by conflicting perspectives but also enables an exploration of interactions spanning various levels, allowing an historical review as well as a comparative observation. These methods have been previously applied and validated in multiple policy areas, such as education [22,23], employment [24], digital health and artificial intelligence [25,26], and PUI [3].

2.1. Eligibility criteria

Eligible records had to be drafted by government institutions and be binding in nature, meaning they have a legally binding force for the actors covered by them (i.e., laws, policies, act, decrees). Although several national plans, strategies, and social programs pertain to this area, they were not included in the analysis because they are not legally enacted instruments. The exclusion of non-enacted policies may indeed pose a limitation, as valuable insights from these plans and strategies could provide additional context or evidence. However, in specific cases where these references were deemed particularly relevant, the discussion incorporates selected references to national plans and strategies. These references offer supplementary context, especially in areas where such plans address internet use among adolescents, helping to contextualise the legal landscape despite their formal exclusion from the core analysis.

Eligible records had to cover any single or combination of topics from mental health, digital space, data protection, cybersecurity, market regulation, public health policies, online gambling, pornography, or other aspects related to the use of the internet in adolescents. There were no limitations on the time of publication.

2.2. Data collection

Data collection was primarily conducted through official national policy repositories and EU policy databases (Eur-LEX, N-Lex), with supplementary searches being done through academic and grey literature databases. The first step was to develop a list of general topics, mostly related to internet regulation, digital space protection and general areas of policies that might affect the behaviour of people on the internet (see Table 1). Individual keywords were translated into the respective languages of the studied countries. The second step of the collection process was policy identification, where we identified policies that could be considered relevant to the field of PUI. In the third step, national policy data related to PUI were extracted from their original sources (see Appendix 1 for a list of policy repositories used). The fourth step of the search strategy was to complement the policy data with scientific and grey literature sources to further minimise potential oversight of policy developments. A systematic search was performed in MEDLINE (see Table 2). Targeted searches for grey literature were performed in Google Scholar, screening only the first 300 hits. This limit was selected based on running multiple searches on a specialized theme where anything beyond that limit was deemed unlikely to produce any relevant results and/or unfeasible to conduct a full search of all items, as those were exceptionally many and/or irrelevant to the topic [27]. Finally, data from the policy and complementary searches were pooled into a single dataset.

2.3. Data analysis

The policy path dependency framework guided the analysis, focusing on the direct and indirect relationships of policies to PUI, their orientation (market or public health), and their social impact at micro (individual), meso (group), and macro (societal) levels. That analytical framework allowed three levels of analysis. Firstly, based on a historical

Table 1
List of concepts and individual keywords.

Keywords related to the concept of internet	Keywords related to the concept of Digital Interaction	Keywords related to the concept of health
Digital – Digital Space	Protection	Health
Cyber	Market	Wellbeing
Internet	Service	Disease
Online	Device	Illness
Network	Media	Abuse

Table 2
Query build-up for Medline and Google Scholar.

MEDLINE	1. (internet OR digital OR screen OR cyber* OR net OR online OR media OR electronic device* OR electronic gadgets OR computer OR mobile OR phone OR smartphone OR television OR TV OR video OR Facebook OR game OR gaming OR porn* OR "sexually explicit material*" OR SEM OR erotic* OR non-paraphilic OR cyberporn* OR cybersex OR "sexual material" OR "sexual content" OR "online shopping" OR "e-commerce" OR "e-tail" OR "e-shopping" OR "delivery" OR "gambl*").ti,ab,kw. 2. (addict* OR "use" OR dependent* OR overuse OR abuse OR disorder OR excessive OR effects OR habits OR misuse OR pathological OR problem* OR compulsive OR heavy).ti,ab,kw. 3. (policy OR legislation OR law OR regulation OR directive).ti,ab,kw. 4. (Netherlands OR Dutch OR Spain OR Spanish OR Hungary* OR Lithuania* OR Portugal* OR Estonia* OR Switzerland OR Swiss).ti,ab,kw. 5. 1 and 2 and 3 and 4
Google Scholar (300*21 = 6300)	"problematic internet use" policy Netherlands "problematic internet use" policy Spain "problematic internet use" policy Hungary "problematic internet use" policy Lithuania "problematic internet use" policy Portugal "problematic internet use" policy Estonia "problematic internet use" policy Switzerland "internet addiction" policy Netherlands "internet addiction" policy Spain "internet addiction" policy Hungary "internet addiction" policy Lithuania "internet addiction" policy Portugal "internet addiction" policy Estonia "internet addiction" policy Switzerland "digital addiction" policy Netherlands "digital addiction" policy Spain "digital addiction" policy Hungary "digital addiction" policy Lithuania "digital addiction" policy Portugal "digital addiction" policy Estonia "digital addiction" policy Switzerland

review, was the initial phase of listing existing policies related to PUI, identifying key legislative milestones and their foundational principles for each country, in the context of EU development. This analysis aims to provide a temporal and contextual reflection of the development of policies related to PUI in the countries selected. As previously mentioned, this historical review follows a policy path dependency framework to analyse the development and impact of those legal instruments concerning PUI across selected countries, enabling a comprehensive examination of the intersections between historical, political, and social forces related to PUI policies within a broader context. Secondly, we did a policy-mapping of individual countries which was a critical analysis of current policies in each of the seven countries. This included examining laws, acts, directives, and other relevant legal instruments, focusing on their objectives, implementation strategies, and impacts on PUI. Finally, we performed a comparative policy-mapping at the micro, *meso* and macro level, offering a comparative analysis of the seven selected countries generally and specifically in relation to the EU.

3. Results

In total, 70 records were included in the analysis, coming from policy repositories, academic and grey literature databases. All the policies are national or federal policies of each of the countries included in this research (See Appendix 2 for the final list of policies included in the analysis clustered by country and topic area). The details of the different stages and the results of the search strategy of this policy review can be summarised in the PRISMA flow chart.

3.1. Historical review

The historical review of policies related to PUI across the seven countries emphasises a nuanced evolution in the digital policy landscape. Initially, many of these policies were mostly focused on broader aspects of internet usage, such as telecommunications regulation, data protection, and the protection of minors from harmful content. For instance, the Netherlands' Telecommunications Act of 1998 and Switzerland's Federal Act on Data Protection (FADP) of 1992 (effective since 1993 with subsequent revisions) represent early initiatives to establish regulatory frameworks for the digital space. These laws emphasize the availability and quality of telecommunication services and data privacy, respectively, without directly addressing PUI.

Over time, we observed a discernible shift towards more targeted initiatives that, while still not explicitly focusing on PUI, began to address closely related issues. Portugal's establishment of the Portuguese Safer Internet Centre in 2007 and Lithuania's Law on the Protection of Minors against the Detrimental Effect of Public Information of 2002 serve as examples. These policies, although not directly mentioning or really addressing PUI, contributed to creating a safer internet environment, particularly for vulnerable groups like children and adolescents, by promoting digital literacy and safeguarding against harmful online content. This reflects a growing recognition of the internet's impact on societal well-being and the need for protective measures. However, they only provide limited and partial approaches to PUI without considering it as one complex phenomenon with social, health, political and economic consequences.

An integral historical review of the policies related to these seven countries suggests that there is a general trend towards progressive development in policy responses to challenges related to the internet. Initially broad and indirectly related to PUI, these policies have evolved to more specific interventions that, while still not explicitly addressing PUI, in some cases, propose a partial contribution to mitigating some of its negative effects. This follows the similar progressive trend that reflects a growing awareness of the risks associated with internet use and a consequent increase in regulatory measures at EU levels [3]. The increasing number of policies, laws, and regulations related to internet use, such as Hungary's Act CXII of 2011 on Informational Self-Determination and Freedom of Information and Estonia's Information Society Strategy 2020 among multiple others, reflects an increasing focus on, and a more nuanced approach to, digital governance. This trend points to the complex nature of PUI, necessitating a heterogeneous policy response that balances the benefits of digital technologies with the need to protect individuals from their potential harms—for example, specific acknowledgement of need of regulations in the UK to adapt to the modern digitalized landscape to protect from gambling harms [2].

3.2. Individual analysis of countries

Generally, the policy mapping of each country shows important elements that are shared by all these seven nations, as well as some differences between them. This section provides a short overview of the gaps when it comes to regulating PUI in each country.

3.2.1. The Netherlands

In the Netherlands, the approach to regulating internet use is characterised by a comprehensive and advanced regulatory framework that only indirectly touches on aspects related to PUI. A wide range of regulations aims to create a safer and more regulated digital environment. Legislation includes the Telecommunications Act (Telecommunicatiewet, 1998), which sets a foundation for the quality and accessibility of telecommunication services, and the Cybersecurity Act (Wet beveiliging netwerk, 2018) aimed at improving the security of network and information systems. These acts, along with other regulations, indirectly contribute to a digital environment that mitigates risks associated with PUI by emphasising individual rights, data protection,

and digital interaction. Generally, in the Dutch approach, while the overarching goal is to strengthen a secure, competitive, and fair digital market, these policies may also, perhaps inadvertently, address factors related to PUI.

At the macro level, regulations such as the Net Neutrality Law (2012) (the Netherlands was the first country in Europe that enacted net neutrality into law) and the Dutch Data Protection Act (updated in 2018) contribute to creating an equitable and privacy-respecting digital landscape. Meso-level analysis shows how generally the market operations are regulated, developing specific laws for some sectors, for instance, through the Remote Gambling Act (2021) emphasising the market development while protecting consumers from gambling problems, indirectly affecting adolescents' internet use. Micro-level considerations focus on individual rights and protections, such as those outlined in the Dutch General Data Protection Regulation (GDPR) Implementation Act (Uitvoeringswet Algemene Verordening gegevensbescherming - UAVG, 2018), aiming to ensure personal data protection and privacy, which is important in the context of social media and online services frequently used by adolescents. The Netherlands not only aligns with, but also often preceded, EU standards, establishing itself as a front-runner in digital regulation. However, the legislative framework has so far been primarily oriented to the market, ensuring competition, consumer protection, and innovation, with only a secondary and indirect impact on public health concerns such as PUI.

3.2.2. Spain

Spanish policies that can be related to the use and development of the internet are similarly focused more on the broader aspects of digital transformation, privacy, and consumer protection rather than directly addressing PUI. The country's approach to internet regulation is embedded within its general digital and data protection laws that, along with Spain's efforts to incorporate the Audiovisual Media Services Directive (AVMSD) and its Digital Health Strategy, reflect an overarching commitment to enhancing digital safety, privacy, and the responsible use of technology.

Despite these advances, Spain's regulatory framework does not specifically target PUI, highlighting a more indirect approach to managing the potential risks associated with internet use through laws and initiatives that cultivate a safer digital environment. Moreover, during recent years, Spain has been gradually incorporating EU regulations into its digital policy landscape, developing a regulatory approach that is primarily market-oriented, emphasising the alignment with EU directives to sustain a competitive and innovative digital economy. The "Agenda España Digital" (Digital Spain Agenda) approaches, including initiatives like "Acelera PYME" and "Conecta España," as well as the "Estrategia Salud Digital" which encompasses various initiatives and plans aimed at improving the efficiency, accessibility, and quality of healthcare services, exemplify the country's efforts to boost digital skills and the digital transformation of businesses, particularly small and medium-sized enterprises, and to bridge the digital divide. However, these initiatives, while contributing to a safer and more inclusive digital space, highlight a regulatory emphasis on market dynamics and digital competency rather than directly confronting public health concerns, for example, related to PUI.

3.2.3. Estonia

Estonia's approach to internet regulation, and therefore PUI, arguably reflects a blend of indirect measures within a broader framework aimed at developing a secure and advanced digital society. The policies in place do not directly target PUI; instead, they create an ecosystem where digital advancements and cybersecurity are prioritised, aligning Estonia's legislative framework with the EU's regulations. Estonia's unique development as a Digital Society is further underscored by its e-Estonia initiative, which has positioned the country as a leader in digital innovation and governance, despite the inherent risks such advancements may pose, such as increased vulnerability to cyber threats and the

potential for data privacy breaches. At a macro level, Estonia's legislation shows a strong orientation to public services and market development, aiming to cultivate a competitive digital economy and innovation-friendly ecosystem, as the case of the promotion of electronic transactions (Digital Signature Act - Digitaallikirja Seadus, 2000), which facilitates secure e-transactions, indirectly supporting safer internet use by establishing controlled access to services and transactions. On a meso level, businesses and institutions are incentivized to adopt data protection and cybersecurity practices, fostering a culture of trust and safety in the digital domain. At the micro level, individuals benefit from a secure online environment through rights and freedom protections that aim to address the challenges of a digital society. While Estonia's regulatory framework for the internet and a digital society sets a standard within the EU, it also faces challenges of maintaining internet freedom and protecting against the risks associated with a highly digitalized society. In this context, the indirect regulation of PUI may impose even more complex challenges, especially among adolescents.

3.2.4. Lithuania

In Lithuania, the Communications Regulatory Authority (RRT) oversees electronic communications but does not regulate content or address its impact on public health (Law on Electronic Communications, 2004). The Law on Electronic Communications focuses on market regulation while neglecting risks associated with PUI.

Despite efforts such as the EU-funded "Safer Internet" initiative (RRT, 2007) and cybersecurity measures (Cybersecurity Law), the Law on Criminal Intelligence (2018) and some articles of the Criminal Code of Lithuania which directly addresses cybercrime comprehensively, policies remain fragmented with a primary focus on market regulation rather than public health interventions that may address PUI. Reports to the RRT indicate growing concerns about harmful content, yet regulations primarily emphasize digital literacy rather than the broader implications of digital well-being (European Parliament and the Council, 2022).

Lithuania lacks national policies on digital technology use in education, despite evidence of excessive screen time among children and adolescents (National Studies, 2024). While the Education Law highlights the importance of information literacy and well-being, it does not address risks related to technology overuse (Education Law, 2024). Similarly, hygiene standards provide only minimal guidance on screen exposure, failing to incorporate health-related recommendations (HN 21:2011).

Existing regulations, such as the Law on Information Society Services and the Law on the Protection of Minors from Negative Public Information, acknowledge the risks of digital content but offer limited enforcement mechanisms (Law on the Protection of Minors, 2010, updated 2017). The DSA mandates content moderation responsibilities, yet service providers are not required to proactively monitor harmful material (Regulation (EU) 2022/2065).

Public health concerns include the potential for digital addiction, exposure to harmful content, and manipulation by large online platforms (Digital Services Act, 2024). The DSA highlights risks such as disinformation, algorithm-driven exploitation of minors, and the promotion of addictive behaviours (European Commission, 2024). However, Lithuania's policies do not adequately address these risks, and content regulation remains ineffective due to the global nature of digital services (Audiovisual Media Services Directive).

One exception is the Law on Gambling, which includes measures to mitigate gambling addiction (Law on Gambling, 2024). However, similar regulatory approaches have not been applied to other digital risks. The lack of a comprehensive framework leaves gaps in protecting public health, particularly regarding excessive digital consumption and its psychological consequences.

Overall, Lithuania has made progress in cybersecurity and digital market regulation but lacks coherent policies addressing the intersection of digital transformation and public health. Regulatory frameworks

need urgent revision to account for the evolving digital landscape and its societal impacts.

3.2.5. Hungary

The case of Hungary also follows approaches in other countries, where policies related to the internet address only indirectly PUI. The analysed policies, rooted in Hungary's efforts to incorporate EU regulations, including areas such as data protection, cybersecurity, consumer rights, and gambling, where the Gambling Act XXXIV of 1991 (updated in 2003) sets the framework for online and offline gambling activities, incorporating measures like self-exclusion programs and age verification to protect individuals. This legislative environment illustrates Hungary's macro focus on market regulation, ensuring data protection, security, and consumer rights, while indirectly contributing to a safer internet. At the *meso* level, organisations are compelled to adopt stringent data protection and cybersecurity measures, fostering a market for privacy-enhancing technologies. On the micro level, individuals are empowered with greater control over their personal data, indirectly addressing concerns related to PUI by promoting digital literacy and safer online practices.

3.2.6. Portugal

Along similar lines, Portugal offers a legislative framework regarding the internet that is characterised by an approach that integrates EU regulations to ensure data protection, privacy, and a secure digital environment. The Data Protection Law (Law No. 58/2019), as a prime example, complements the EU's GDPR, establishing a legal foundation for data privacy and protection in Portugal. This law, along with others, indirectly impacts PUI by furthering a safer online space, emphasising individual rights and mandating stringent data handling practices by entities. Portugal's digital policy landscape reflects a focus on market regulation, with indirect benefits for public health by creating a secure, privacy-respecting online environment conducive to reducing vulnerabilities associated with PUI. Concrete examples of this are the *Portuguese Safer Internet Centre* which promotes responsible use of the internet through public awareness, guidance, and illegal content reporting services (Portuguese Safer Internet Centre, 2024). It operates two awareness programs: one for the general public (CIS) and another for schools (SeguraNet). The centre also offers Linha Internet Segura, a free and confidential service for safe internet guidance and reporting harmful content like child abuse, racism, and violence. Over the past decade, it has expanded its initiatives and partnerships, and it coordinates activities for Safer Internet Day, under the theme 'Together for a Better Internet'.

3.2.7. Switzerland

Switzerland's approach also only indirectly mitigates risks associated with PUI from a health perspective by ensuring a safer online environment through data handling and privacy, among other values and principles. Despite not being an EU member, Switzerland demonstrates a strong alignment with EU standards, particularly evident in its adherence to principles akin to the EU's GDPR through the Federal Act on Data Protection (FADP) (1992 and updated in 2023). Generally, the Swiss policy approach emphasises a safe digital space as well as market regulation, focusing on safeguarding individual rights and ensuring secure digital interactions, which indirectly contributes to public health by promoting responsible use of the internet and reducing vulnerabilities associated with PUI. In this line and since 2017, the new Federal Law on Gambling (Ljar), added more protection of minors and legal restriction to gamble (including online sphere) to 18 years old and in some cases, even to 16 years old. Likewise, the new Federal Law on the Protection of Minors in the Film and Video Game (LPMFJ - 2022) and the related ordinance (OPMFJ) that will come into force in January 2025, create a better protection system for children and young people against inappropriate content.

The 'Digital Switzerland Strategy' gives an account of Switzerland as

one of the most digitally competitive and innovative countries in Europe, prioritising digital solutions in public services and aiming for a digital transformation of the country. According to the Monitoring Report on Digital Switzerland Strategy (2023), Switzerland's digital transformation is mainly focused on three key areas: digitalisation in healthcare, digitalisation-friendly law, and digital sovereignty. Significant progress has been made, including the expansion of the Swiss Personalized Health Network (SPHN) for health-related research, development of the DigiSanté programme, and the revision of the Federal Act on the Electronic Patient Record (EPRA). Legal frameworks for digital transformation have been addressed, with future initiatives planned for regulation of artificial intelligence and e-ID legislation.

Table 3

Comparison of Included Records, divided by Domains.

Country	Domain	Records
Netherlands	Digital Space	Telecommunications Act (Telecommunicatiewet) Net Neutrality Law Dutch Data Protection Act (Wet bescherming persoonsgegevens) Dutch GDPR Implementation Act (Uitvoeringswet Algemene Verordening gegevensbescherming or UAVG)
	Data Protection	Cybersecurity Act (Wet beveiliging netwerk- en informatiesystemen)
	Cybersecurity	Remote Gambling Act (Wet Kansspelen op afstand)
	Gambling	Law on Audiovisual Communication
	Digital Space and Open Internet	Organic Law 3/2018 on the Protection of Personal Data and Guarantee of Digital Rights (LOPDGDD) Conecta España Estrategia Salud Digital Acelera PYME Digital Signature Act (Digitaalalikirja seadus)
Spain	Data Protection	
	Agenda España Digital	
Estonia	Digital society	e-Estonia initiative e-Residency initiative Information society strategy Criminal Code of Lithuania
	Cybersecurity	Law on Criminal Intelligence Law on CyberSecurity
Lithuania	Telecommunications	Law on Electronic Communications
	Education	Education Law
	Gambling	Law on Gambling
Hungary	Online Pornography and Internet safeness	Law on the Protection of Minors against the Detrimental Effect of Public Information
	Digital Space	Audiovisual Media Services Directive Safer Internet initiative
	Open Internet	Law on Information Society Services Act XXXIV of 1991 on Gambling Operations Act CXII of 2011 on Informational Self-Determination and Freedom of Information
Switzerland	Gambling	Federal Act on Data Protection (FADP)
	Open Internet	Telecommunications Act (TCA)
	Data protection	Federal Act on the Protection of Minors in the Area of Films and Video Games (JSFVG)
	Telecommunications	Federal Act on Gambling (LJAR)
	Minor Protection	Swiss Personalized Health Network (SPHN)
Portugal	Gambling	Federal Act on the Electronic Patient Record (EPRA)
	Public Health	DigiSanté Data Protection Law (Law No. 58/2019)
Switzerland	Digital Switzerland Strategy	CIS
	Data protection	SeguraNet Linha Internet Segura
Portugal	Safer Internet Centre	

However, the Monitoring Report on Digital Switzerland Strategy (2023) highlights the need for Switzerland to accelerate digitalisation efforts, especially in digital public services, to remain competitive and innovative.

3.3. Comparative Analysis at the micro, meso and macro level

The following social analysis compares the seven countries' policies at a micro, meso and macro level. The laws, initiatives and strategies that were cited in this analysis are listed in [Table 3](#).

At the macro level, all seven countries demonstrate a commitment to creating secure and safe digital environments, in which societal principles of autonomy, transparency, security, and digital rights take precedence. These values are promoted through various national laws developed to align with, and in some instances advance beyond, EU directives, reflecting a commitment to safeguarding individual rights in the digital realm. The macro analysis underscores a shared emphasis on digital inclusion and cultural diversity, as seen in Switzerland's Telecommunications Act and Portugal's implementation of the EU's GDPR through Law No. 58/2019. These laws not only seek to protect individual data and privacy, but also aim to bridge the digital divide, ensuring equitable access to digital technologies and services across societies. Moreover, initiatives like the Digital Switzerland Strategy and Estonia's e-Estonia program illustrate advanced commitments to digital innovation, governance, and societal welfare, showcasing how national policies can extend EU principles into broader, more inclusive digital ecosystems.

Furthermore, the existing regulatory frameworks in these countries show an emphasis on fostering market development and innovation, in many cases overshadowing the equally critical need to address the mental and psychological consequences of internet use among adolescents. While initiatives like Portugal's establishment of the Portuguese Safer Internet Centre and Lithuania's Law on the Protection of Minors against the Detrimental Effect of Public Information are steps in the right direction, they represent indirect and partial approaches to mitigating PUI's impact. These policies contribute to promoting digital literacy and safeguarding against harmful online content, but do not address PUI as a phenomenon with profound social, health, political, and economic consequences.

At the *meso* level, the analysis across the seven countries reveals a focused effort on creating regulatory environments that stimulate innovation, protect consumer interests, and promote fair market practices. For example, the GDPR and its national implementations, such as Portugal's Law No. 58/2019 and Switzerland's FADP, lay the groundwork for businesses to innovate while adhering to stringent data protection standards. These regulations regulate organisations that play a crucial role in the digital sphere, such as social network platforms, affecting their product development and marketing strategies. They also pose compliance costs, especially for small and medium-sized enterprises, highlighting a tension between innovation and regulatory compliance. This meso-level analysis underscores the balance between fostering a dynamic digital market and ensuring that the digital rights and privacy of individuals, particularly adolescents, are safeguarded.

At the *micro* level, the policy mapping across the seven countries gives an account of a strong commitment to protecting and respecting individual rights of citizens and consumers. Additionally, there are relevant efforts to empower and secure access to the digital sphere. Programs like Spain's "Conecta España" and Estonia's e-Residency initiatives aim to bridge the digital divide and enhance digital literacy, ensuring that all segments of the population can navigate the digital world safely and responsibly. Moreover, measures, such as Lithuania's focus on cybersecurity education and Switzerland's investment in digital literacy programs, highlight the role of education and awareness in complementing legal measures. These efforts at the micro level are vital in empowering individuals with the knowledge and tools to protect themselves online, enhancing a culture of safe and informed use of the

internet among adolescents. However, the analysis showed that there are no policies that directly regulate the problems associated with the use of the internet, such as the case of PUI, leaving a gap in the protection of vulnerable groups at the micro level.

4. Discussion

This study is the first to comparatively analyse the composition of national-level regulatory framework related to PUI in seven European countries. Our findings reveal a market orientation across the seven countries in developing policies related to PUI and broader internet usage, often prioritising market considerations over public health concerns. This orientation is evident in the strategic alignment with EU directives that emphasize not only the protection of individual rights and data privacy, but also the creation of a competitive digital single market, without confronting the consequences of PUI and its public health implications. This situation highlights a significant gap in the policy landscape, giving account of the need to develop specific policies related to the use of the internet and its public health effects. The current state of regulation, therefore, suggests a missed opportunity for a more holistic approach to digital governance that balances market growth with public health safeguards. Many countries have advanced in certain aspects, as they have developed digital and internet governance policies focusing on telecommunications regulation, data protection, cybersecurity, e-government, e-commerce, and others. Countries such as the Netherlands and Estonia have also exemplified a forward-thinking stance on digital governance, shaping the notion of a digital society. These efforts have been developed following the data privacy and cybersecurity standards imposed by EU directives. Moreover, the strategic adaptation of EU directives into national laws, as observed in Switzerland (through the FADP and the Telecommunications Act), illustrates the nuanced interplay between regional cohesion and national autonomy, despite its non-EU status. Along this line, Portugal showcases its commitment through the Data Protection Law (Law No. 58/2019), which aligns with the GDPR. Similarly, Hungary's Act CXII of 2011 and Spain's Organic Law 3/2018, which not only incorporates GDPR but also includes unique provisions for digital rights, indicating a nuanced understanding of digital privacy and security concerns. In this line, Lithuania emphasises cybersecurity with its comprehensive Law on Cyber Security, reflecting an alignment with the EU's NIS (Security of Network and Information Systems Directive) and showcasing its stance on digital security. This highlights the concerted effort across nations to not only meet but in some cases exceed EU directives for digital safety, privacy, and security. Nevertheless, these measures generally fall short of directly addressing the unique challenges posed by excessive usage of internet or PUI, particularly among vulnerable populations such as adolescents.

Innovation in policy development is urgently needed to bridge this gap. A potential area for innovation lies in the integration of mental health services and support mechanisms directly into digital governance frameworks. This could involve the introduction of targeted policies that specifically address the risks and consequences of PUI, including educational initiatives, parental guidance, and accessible mental health support, especially for adolescents. This needs to include preventative programs that pro-actively screen for PUI on a population level and offer indicative easy to access interventions. Many countries are already starting to address this governance gap in various areas. One example are educational initiatives which have been introduced, at least at a regional level. Stricter smartphone legislations have been mandated in France and parts of Spain, while the Netherlands adopted a policy framework regulating smartphone use at school [28–30].

Moreover, considering the global scale of the digital market and the local or regional enforcement of public health policy, there is a need for collaborative efforts that transcend national boundaries. Such collaboration, for example at EU level, could facilitate the development of harmonised standards and best practices for managing PUI, aligning

market objectives with public health priorities.

Recent increases in the minimum age for use of social media across several nations underscore a growing awareness of the mental health impacts of social media consumption among children and adolescents. In response, countries like the Netherlands and Portugal have moved to align their digital policies with evolving EU standards, emphasising the role of age restrictions as a preventative measure against early exposure to potentially harmful online content. Countries outside the EU have also started adopting legislation to address the harm posed social media. In the USA, the state of New York has introduced the *SAFE for Kids Act* (Stop Addictive Feeds Exploitation for Kids Act) (2024), which aims to implement restrictions on personalized algorithmic feeds and suspending message notifications during night time. These shifts reveal a nascent recognition of PUI's mental health implications, especially for young individuals vulnerable to social media's psychological effects. While these age increases represent progress, they remain limited in scope, focusing more on access control than on addressing the broader, nuanced impacts of PUI. A more holistic approach is needed—one that includes educational outreach, family-oriented digital literacy programs, and readily accessible mental health resources. One example for more coordinated efforts regarding PUI-related harms could be South Korea's approach at tackling their high rates of problematic gaming and internet-related disorders. Various ministries are involved in prevention and intervention strategies addressing PUI, including education and treatment, making South Korea a pioneer regarding their legislative response [31]. This model shows how a multi-sector strategy can address PUI at a public health, educational and digital governance level. Approaches like these could better equip adolescents and their families to navigate the complexities of digital life safely, ensuring that age-based restrictions work in concert with broader, supportive frameworks that truly address the psychological challenges of use of social media and the internet more generally.

5. Conclusions

While the seven countries under review have made progress in digital regulation, their current policies predominantly reflect a market orientation and are aligned with EU common market directives without directly tackling PUI. The emphasis on data protection and cybersecurity, although important, overshadows the need for policies that address the mental health implications of internet use. To effectively confront the challenges posed by PUI, especially among adolescents, a more targeted policy response is important. This response should not only enhance the existing digital governance framework, but also incorporate measures that address the specific needs and vulnerabilities of individuals at risk of PUI, thereby facilitating a digital environment that supports both market innovation and public health.

Therefore, policy recommendations emerging from this research are 1. Developing policies specifically addressing excessive internet use and its effect on public health; 2. Adopting a more holistic approach to digital governance, which considers psychological, social, economic and legal dimensions; 3. Integrating mental health services and support mechanisms directly into digital governance, e.g. through educational initiatives, parental guidance, accessible mental health support; 4. Fostering collaborative efforts across borders, to develop harmonised standards and best practices for PUI, aligning market objectives with public health priorities; 5. Establishing frameworks addressing psychological challenges of digital media use. These policy recommendations will contribute to a more holistic approach addressing PUI at a governmental level, aiming to reduce PUI-related harms on the population, balancing market interests and public health.

With this current work, we have now assessed the implications of digitalization's progression and its associated risks, offering a critical examination of policies related to the use of the internet within seven nations. However, it is important to also acknowledge certain limitations which derive from the manuscripts focused scope, sampling

method and followed analytical process. A notable limitation arises from its primary focus on legislative actions, which may not fully represent the efforts of national and regional governments or the pivotal contributions of non-governmental organisations in tackling PUI across various strata of society. Consequently, it is imperative to consider these findings within a broader context that includes evidence from supra-national, regional, and local initiatives. Future studies therefore should leverage methods that go beyond descriptive comparison, for example the implementation analysis framework. Addressing PUI requires a shift from solely market-oriented digital policies towards a more comprehensive approach that considers mental health as one of the key priorities.

Another issue is the gap between policy and implementation as we have not assessed this, however this was not the focus of this work; future studies can consider barriers to implementation to expand on our understanding of the pragmatic impact of these legislative endeavours in preventing harms. While the seven countries reviewed have advanced significantly in digital regulation, the prevailing focus on data protection and cybersecurity fails to tackle the public health challenges associated with PUI. This is particularly crucial for adolescents, who are increasingly vulnerable to the mental health implications of PUI. A policy framework that not only upholds market innovation but also integrates public health safeguards could promote a healthier digital environment.

Expanding on this, this manuscript acknowledges the need for broader analyses that include various policymakers at regional and local government levels and the inclusion of diverse stakeholders, such as practitioners and affected populations, to create a fuller picture of PUI interventions and to capture conflicting viewpoints and policy contestation to understand policy dynamics. Future research should extend to additional countries, perhaps particularly in low- and middle-income countries, where so many people live. As the field strengthens, it will likely remain important to emphasize the value of harmonizing digital policies across countries, while being mindful of cultural differences and grounded in best practices from various contexts.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.comppsy.2026.152674>.

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