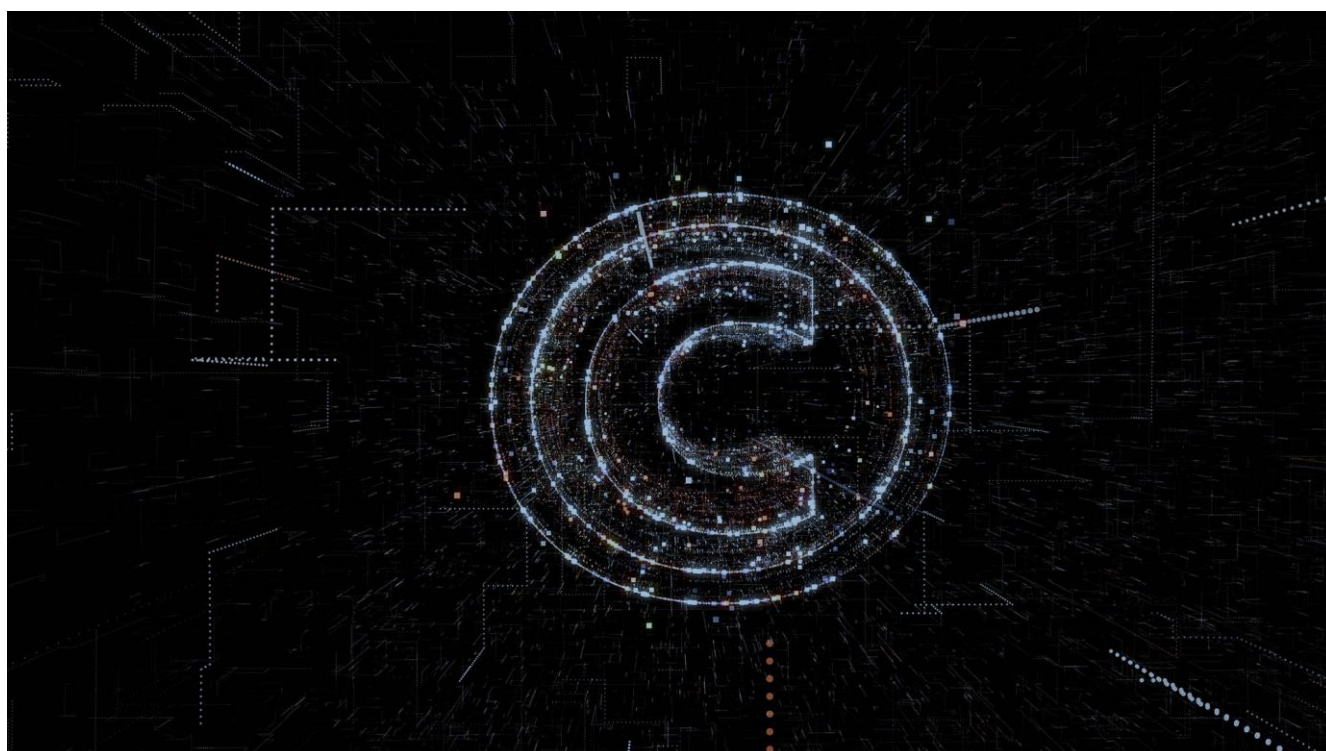


# ONLINE COPYRIGHT INFRINGEMENT IN THE EUROPEAN UNION

## FILMS, MUSIC, PUBLICATIONS, SOFTWARE AND TV (2017-2022)



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## Foreword

Online copyright infringement poses serious legal and economic problems for right holders and for society as a whole. If artists and creators are not compensated for their work, it may lead, in the long term, to a reduction in the choice available to consumers. In this context, fighting copyright infringement is one of the priorities of the European Commission.

In 2019 and 2021, the EUIPO published studies of online copyright infringement that were based on a large dataset of accesses to pirated film, music and TV content on the internet in all EU member states and the UK. The main outcome of these studies was that access to pirated content declined between 2017 and 2020.

This report builds on those previous studies but has a longer time series, namely until the end of 2022. The main finding is that the declining trend seen in the earlier studies seems to be reversing, with piracy increasing again, mainly due to increases in piracy of TV content and publications.

The present study includes some enhancements compared to the previous versions. First, in the context of the Commission's Recommendation on combatting online piracy of sports and other live events, a new section is added on this particular type of piracy. Moreover, the new piracy dataset provides information on two content types not studied earlier, publications and software (albeit only for 2021 and 2022).

This study was included in the 2023 Work Programme of the Observatory.



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## Executive Summary

Copyright infringement in the digital era has become a very serious issue for right holders. Stopping this phenomenon is complex, as piracy evolves with technology. Understanding piracy's underlying mechanisms is essential to adopting effective policies that contribute to reducing it.

This is the third study published by the EUIPO on the evolution of online copyright infringement of films, music and TV content. It has been enhanced in three main respects. First, besides the three types of content analysed in previous studies, it also includes publications and software piracy. Secondly, a new section on live event piracy has been added. Finally, the data covers 2021 and 2022.

Piracy consumption is examined in the EU Member States and the UK <sup>(1)</sup> for TV programmes, music, films, publications and software, from desktop and mobile devices, using diverse access methods such as streaming, downloading, torrents and stream ripping software.

The unit of measure used in this study is the number of accesses to pirated content per internet user per month. The dataset is broken down into several categories, such as the country of residence of the consumer of copyright-infringing content, the access method, the type of content, the genre, the source, and the type of device used.

The conclusions presented in the descriptive section are at the EU level, and the main statistics are given by member state. A breakdown per country and piracy per content type is available in the annexes. Data shows that accesses to pirated content per internet user per month for all types of content started at about 11.5 in 2017, reached a minimum of about 5 at the beginning of 2021, and

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<sup>(1)</sup> The UK is included in the descriptive section of this study for comparison with the earlier studies. However, the econometric analysis was carried out using data for EU27 only.

increased to 7<sup>(2)</sup> at the end of 2022. Despite this reversal, the number of accesses per user per month in December 2022 was still 40 % lower than in January 2017.

Overall, piracy showed an annual decrease until 2021 and a slight growth of 3.3 % in 2022. The underlying change of trend occurred at the end of 2021.

The recent increase is mainly due to the growth of TV piracy, which represented 48 % of total aggregated piracy (TV, films, music, software and publications) in 2022. Piracy of films and music is still decreasing, while piracy of software and publications showed a significant increase in 2022.

At the national level, there are significant differences, both in terms of habits (e.g. some countries seem to prefer mobile devices when consuming pirated content, while others prefer desktop devices) and the number of accesses per capita. Although piracy on mobile devices had an increasing profile until the beginning of 2020, when it was the preferred option, since mid-2020 accesses on desktop devices have again moved above mobile accesses.

Regarding the method, 58 % of piracy occurs via streaming and 32 % via download. Many of these users seem accustomed to consuming pirated content, as the main source is through direct accesses to the relevant piracy site, with one quarter of accesses coming via search engines.

Moreover, particular attention was paid to trends during the COVID-19 crisis. Different patterns for 2020 and 2021 were found, which were probably associated with the pandemic. The impact of COVID-19 was uneven across types of content. The clearest effect was evident in the consumption of pirated films, which declined in the second quarter of 2020, moderated its decrease until the end of 2020 and, after some growth, stabilised in 2022. This significant decrease occurred in all the EU member states, with a reduction of over 60 % in Ireland and Poland. One possible reason for this phenomenon is that users may have opted for legal platforms as a simpler way to access the type of content they are interested in, coupled with limited opportunities to spend money on outside

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<sup>(2)</sup> This excludes software and publications to make the value comparable with those of the period 2017-2020 in which these categories were not available.

entertainment. No such behaviour was encountered for TV and music. The impact remained in 2021 and 2022. The patterns for those years were significantly different from those in 2017-2019.

The following are specific observations for each content type.

1. **TV** content is the most pirated content type in the EU, accounting for nearly half of internet accesses. Following the increase in 2021, 2022 seems to have ended on a plateau. In more than 95 % of cases, TV piracy occurs via streaming. Access from desktop devices is still the main option, although mobile devices are also frequently used. The EU27 average number of accesses for TV content is about 5 per internet user per month.
2. **Film** piracy increased by 17 % in 2022 compared to 2021 and seems to be approaching a flat profile. The EU27 average is about 1.1 accesses per internet user per month. Streaming is the most important access method.
3. **Music** piracy has continued to decline since 2017. The most prominent method is ripping, with mobile devices representing about 70 % of all accesses.
4. **Publications** piracy is the second most important type of piracy after TV. It has a growing profile, which is currently at 2.7 accesses per internet user per month. Manga is the most important pirated genre, accounting for nearly 60 % of accesses. The second most important genres are audio and ebooks. The main method to obtain pirated publications is downloading.
5. **Software** piracy has been slowly increasing and appears to be stabilising at about 0.75 accesses per internet user per month. The main method is downloading and, although accesses from desktop are nearly flat, accesses from mobile devices are steadily increasing. Games and software for mobile devices represent about half of all accesses.

The evolution of pirated accesses to **live sports events** was also analysed for 2021 and 2022 (data was not available for earlier years). As in the other cases, there is a high degree of dispersal across EU member states and an increasing trend, which reached about 0.7 accesses per internet user per

month at the end of 2022, representing a growth of about 75 % compared to the beginning of the series in January 2021.

In addition to the descriptive statistics, an econometric analysis was performed for film, music and TV piracy. The main conclusions of this analysis were as follows:

- **Piracy in each of the three domains studied behaves differently.** The explanatory variables are different and, even when there is a coincidence, the size of the associated coefficient varies.
- **Economic and social factors influence piracy.** The models show that a country's per capita GDP, inequality, population structure and youth unemployment all influence piracy.
- **The number of legal offers contributes to reducing piracy in all three domains.** In addition, for TV and films, the variation of the offer for either type of content has an impact on piracy of the other type.
- **The models confirm that the COVID-19 pandemic contributed to reducing film and TV piracy (but not music piracy).**
- **There is some substitution between pirated and legal content.** The models have shown that there is an inverse relationship between consumption of legal content and piracy in all domains.

# 1 Introduction

Copyright infringement in the digital era has become a very serious issue for right holders. The phenomenon is complex, as piracy evolves at the same pace as technology. It is therefore necessary to understand how piracy occurs as a prerequisite to taking action to reduce it.

The main objective of this study is the analysis of web-based<sup>(3)</sup> illegal consumption of protected TV, music, film, software and publications content in the EU Member States and the UK between 2017 and 2022. This study is an update of the one published in 2021 that was based on 2017-2020 data. The availability of new data for 2021 and 2022 may shed additional light on piracy to confirm, reject or suggest new hypotheses to explain the phenomenon.

In addition, the dataset includes new data on software and publications piracy in 2021 and 2022. Moreover, within each of the five domains<sup>(4)</sup> a split per genre is now available, making it possible to add a section dedicated to live sports event piracy.

The report is divided into two main parts:

1. A **descriptive analysis** in which the main goal has been to represent aggregated data in a visually understandable form that allows reader to grasp the main idea. This analysis will describe various aspects of digital piracy, including:
  - a. the number of unlicensed accesses to protected content, by type of content and by EU Member State;
  - b. the evolution of digital piracy over time in the EU27 and in each EU Member State;

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<sup>(3)</sup> Pirated content consumption from other sources, for instance IPTV-related, are not in the scope of this study.

<sup>(4)</sup> Films, music, software, publications and TV.



- c. improved knowledge of the methods used to obtain pirated content, and how this is linked to the types of content, sources, and types of devices;
  - d. users' habits, and how they vary in each country.
2. An **econometric analysis**: following the descriptive analysis, the report presents a statistical analysis of the socio-economic factors that influence piracy in the EU Member States.

Both the descriptive and econometric analysis of this study have been carried out in R<sup>(5)</sup>.

Following this introductory section, Section 2 briefly discusses copyright and copyright infringement, while Section 3 describes the data used for the subsequent analysis. The key results are presented in Section 4 (descriptive statistics and piracy trends) and Section 5 (the econometric analysis). The final section sets out the conclusions and discusses possibilities for further research.

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<sup>(5)</sup> R Core Team (2023). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.

## 2 Copyright in the EU

Copyright law provides authors with exclusive rights that enable them to control the use of their works and to generate income. Authors and/or right holders may authorise or prohibit certain uses of their works, such as reproduction and distribution of copies, as well as communication and making the works available to the public<sup>(6)</sup>.

In addition to author's rights, copyright law creates 'related' (or 'neighbouring') rights, which are designed to reward and/or incentivise creative endeavour and the investments of those who make creative works accessible to the public: music and audiovisual performers, record producers, radio and TV broadcasters, etc. In the EU, the producers of the first fixation of a film are also protected by related rights<sup>(7)</sup>.

Independently of the economic rights, authors also have moral rights that, at least, include the right of authorship and the right of integrity of the work. Other moral rights that national laws may provide for are the right of divulgation and the right of withdrawal. These rights can usually be asserted by the author even if the copyright has been transferred to a third party<sup>(8)</sup>.

Copyright protection is applicable only to the expression of ideas, not to the ideas themselves. Copyright registration (at both the EU and national levels) is not required for copyright protection<sup>(9)</sup>. Protection arises automatically from the moment a work is created. In this respect, copyright differs significantly from other IP rights.

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<sup>(6)</sup> At the EU level, the main 'economic rights' have been harmonised by the so-called Information Society Directive, [D 2001/29/EC](#) of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, OJ L 167, 22/06/2001, pp. 10-19, Articles 2-4.

<sup>(7)</sup> See Articles 2-3 Information Society Directive; see also the 'Rental Rights Directive', [D 2006/115/EC](#) of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version), OJ L 376, 27/12/2006, pp. 28-35, Article 7 et seq.

<sup>(8)</sup> On national approaches to waivers of moral rights, see e.g. the [Frequently Asked Questions on Copyright](#), published by the EUIPO.

<sup>(9)</sup> Voluntary registration is, however, possible in many countries.

Copyright law is governed by the principle of territoriality, which means that each country has a separate system of rules, although international agreements from the end of the 19th century and the 1990s, and European legislation since the early 1990s, have significantly harmonised these rules. Twelve directives have been adopted to harmonise important aspects of the copyright laws in the EU Member States. In addition, two regulations and provisions of several other legal instruments are relevant to the exercise and enforcement of copyright<sup>(10)</sup>.

In the EU, the general rule is that the rights of authors are protected for their lifetime and 70 years after their death<sup>(11)</sup>. The protection conferred by related rights lasts for 50 years after the performance, film or broadcast was published or communicated to the public, and 70 years for phonograms or performances fixed in phonograms<sup>(12)</sup>.

The economic aspects of copyright are complex, reflecting trade-offs between the interests of creators, distributors, performers and consumers, and short-term versus long-term effects. The general objective of the system is to ensure adequate compensation for creators and other rights holders (so that a socially optimal level of creative activity takes place), while at the same time providing broad public access to the creative works and making it possible for other creators to build upon prior works.

Copyright infringement arises whenever a protected work is used without the authorisation of the copyright holder, and when this activity cannot be regarded as permitted use under one of the applicable exceptions or limitations to copyright.

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<sup>(10)</sup> For an overview of EU legislation on copyright law, see the Commission's websites:

<https://ec.europa.eu/digital-single-market/en/eu-copyright-legislation>

<https://ec.europa.eu/digital-single-market/en/copyright>

<sup>(11)</sup> On the term of protection in EU law, see also [Derivative Use of Public Domain Content — Film Industry Focus](#), EUIPO, May 2017, p. 35 et seq.

<sup>(12)</sup> See [Directive 2011/77/EU](#) of the European Parliament and of the Council of 27 September 2011 amending Directive 2006/116/EC on the term of protection of copyright and certain related rights, OJ L 265, 11/10/2011, pp. 1-5

The law creates exceptions and limitations in order to balance copyright protection with competing interests, such as freedom of expression and communication or privacy<sup>(13)</sup>. One of the exceptions to copyright that the EU Member States may introduce into their national law is the so-called private copying exception<sup>(14)</sup>, which refers to making copies of copyright-protected works for strictly personal and non-commercial use. According to case-law from the Court of Justice of the European Union (CJEU), the private copying exception is reserved for the user who has accessed or acquired a copy of the work in a legitimate manner (i.e. with the authorisation or licence of the copyright owners)<sup>(15)</sup>.

In the internet era, copyright infringement has become easier, even when committed on a vast scale — one need only think of unauthorised large-scale file-sharing on BitTorrent-based peer-to-peer networks. The technology used to download copyright-protected content is irrelevant, as is the question of whether the work was downloaded in its entirety or in part.

Downloading a work from the internet constitutes an act of reproduction. During the process of streaming, no fixed copy or file is created on the end user's computer. However, in a case that concerned the sale of a multimedia player with pre-installed add-ons that helped users find infringing content online, the CJEU held that the acts of streaming by end users of this kind of media player are not covered by copyright exceptions<sup>(16)</sup><sup>(17)</sup>.

Under EU law, right holders may also apply for an injunction against an intermediary whose services

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<sup>(13)</sup> Article 5 of the Information Society Directive provides for a long, exhaustive list of exceptions that Member States may implement. The recently adopted 'Copyright in the Digital Single Market Directive' provides for three additional mandatory exceptions. [Directive \(EU\) 2019/790](#) of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.), OJ L 130, 17/05/2019, pp. 92-125, Articles 3-5.

<sup>(14)</sup> Article 5(2)(b) of the Information Society Directive.

<sup>(15)</sup> 10/04/2014, C-435/12, ACI Adam BV and Others v Stichting de ThuisKopie, Stichting Onderhandeligen ThuisKopie vergoeding, EU:C:2014:254.

<sup>(16)</sup> 26/04/2017, C-527/15 Stichting Brein v Jack Frederik Wullems, EU:C:2017:300. Considering, notably, the way in which the features of the multimedia player are advertised, end-users would buy the player deliberately and in full knowledge that they would access a free and unauthorised offer of protected works. In addition, 'as a rule', the temporary acts of reproduction created in this situation by streaming would adversely affect the normal exploitation of the works and cause unreasonable prejudice to the legitimate interests of the right holder; this practice 'would usually result in a diminution of lawful transactions relating to the protected works ...' (§ 69-70).

<sup>(17)</sup> See also the EUIPO's FAQ on copyright for consumers: <https://euiipo.europa.eu/ohimportal/en/web/observatory/faqs-on-copyright>.

are being used by a third party to infringe IPR, including copyright. The CJEU has given guidance on the criteria for liability in cases of alleged online infringements of copyright and related rights<sup>(18)</sup>. It has also clarified, to a certain extent, if and under what circumstances different types of online platforms can be considered to have made a 'communication to the public'<sup>(19)</sup>. According to the most recent Copyright in the Digital Single Market Directive, certain platforms can perform a communication to the public<sup>(20)</sup>.

Type of infringement	Description
Infringement involving physical communication media	Illegal copies of optical discs including laserdiscs (LD), video compact discs (VCD) and digital versatile discs (DVD). Inexpensive to copy using optical media and decryption software.
Online infringement	Unlicensed use on the internet. Piracy with media formats to distribute films, music, TV, software and publications to other internet users.
Signal theft	Receiving cable TV or radio system or satellite signals without authorisation. Piracy through the supply to consumers of illegal cable decoders or satellite descramblers.
Broadcast piracy	On-air broadcasting of a programme, from a legitimate or pirate copy, without permission from the copyright holder.
Unauthorised public performance	An institution or commercial entity showing a programme to its members or customers without permission from the copyright owner.

**Table 1. Types of copyright infringement**

<sup>(18)</sup> It mainly clarified relevant provisions of the Information Society Directive, the e-commerce Directive ([D 2000/31/EC](#) of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, OJ L 178, 17/07/2000, pp. 1-16, and the Enforcement Directive ([D 2004/48/EC](#) of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights (Text with EEA relevance), OJ L 157, 30/04/2004, pp. 45-86).

<sup>(19)</sup> For an overview of recent case-law from the CJEU and national courts in 14 EU Member States on the role of online intermediaries in the enforcement of IPR infringement, see the [IPR Enforcement Case-law Collection: the Liability and Obligations of Intermediary Service Providers in the European Union](#), EUIPO, 2019.

<sup>(20)</sup> Directive 2019/790/EU of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC (Text with EEA relevance.), OJ L 130, 17/05/2019, pp. 92-125, Article 17 et seq., which set out a specific liability regime for certain 'online content-sharing service providers'.

Four methods of accessing unauthorised content online can be described: streaming, downloading, stream ripping and torrenting <sup>(21)</sup>.

The music, TV and film entertainment industry is changing very rapidly. The companies that operate in these domains have adapted their business models to gain new customers and better compete in an evolving market <sup>(22)</sup>. At the same time, some players have made it their business to provide copyright-infringing services and products. Providing access to copyright-protected content often includes resource-intensive activities that require the use of various intermediary services and specialised piracy support services. Pirates may also use sophisticated methods to avoid identification and withstand or immediately recover from enforcement measures targeting their services <sup>(23)</sup>.

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<sup>(21)</sup> Based on 'Musos Methodology 2017, Markets Insight Reports Market Analytics'. See Annex A.1 for a description of each method.

<sup>(22)</sup> See the 2021 [Online copyright infringement report](#) for a description of the various business models (pp. 15-16).

<sup>(23)</sup> See the 2023 EUIPO Live Event Piracy discussion paper on challenges and good practices from online intermediaries to prevent the use of their services for live event piracy.

## 3 Data sources

### 3.1 Online piracy tracking data

MUSO is a company that provides statistics on piracy by tracking visits to sites providing illicit access to copyright-protected content such as music, films, television, publications and software. MUSO provided the EUIPO with data on access to pirated films, TV and music from January 2017 to December 2022 in all 27 EU Member States and the UK. Moreover, for 2021 and 2022, the dataset includes pirated accesses to publications and software.

The MUSO figures represent absolute ‘activity’ values: visits to piracy sites that represent individual accesses that could be associated with the consumption of a creative work. This ‘activity’ is used as the basic data unit in this report. Specifically, the consumption of pirated digital content is defined as the average number of ‘activities’ per internet user per month in each country and period.

The data is broken down into the following categories:

- geographical location: the country of residence of the consumer of copyright-infringing content, for the 27 Member States of the EU and the UK;
- access method: streaming, torrenting<sup>(24)</sup>, downloading and stream ripping;
- type of content: music, films, TV, software and publications;

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<sup>(24)</sup> MUSO distinguishes between public and private torrenting; however, the data has been aggregated in this study.

- genre<sup>(25)</sup>: Films & TV Shows, Anime, Live Broadcast, Live Sports, Music, Web Fiction, Sheet Music, Publishing, Educational, Audiobooks, Manga, Books, Magazines & Newspapers, Software, Games, Application Add-on, Mobile Software, Application Software. See Annex A for additional information on these subcategories.
- physical platform: mobile device or computer/desktop.
- traffic source that indicates how users reach pirated content: direct, search, referral, social, mail, display ads<sup>(26)</sup>. See Annex A for additional information on these sub-categories.

Year	Films	Music	Tv	Publications	Software	Total
2017	7.31	7.53	20.78	-	-	35.61
2018	6.09	5.09	19.09	-	-	30.27
2019	5.64	3.32	17.78	-	-	26.74
2020	4.16	2.09	13.95	-	-	20.20
2021	3.40	2.02	14.74	7.08	2.43	29.68
2022	3.98	1.93	17.50	9.87	2.74	36.03

**Table 2. Total accesses by year (billions) in the EU27 – (Source: EUIPO calculations based on MUSO data)**

In this study, the piracy activity by country and year or month is presented per capita. Specifically, this value has been calculated by dividing the activity figure by the total number of internet users per country for a given year, obtained from Eurostat (see below).

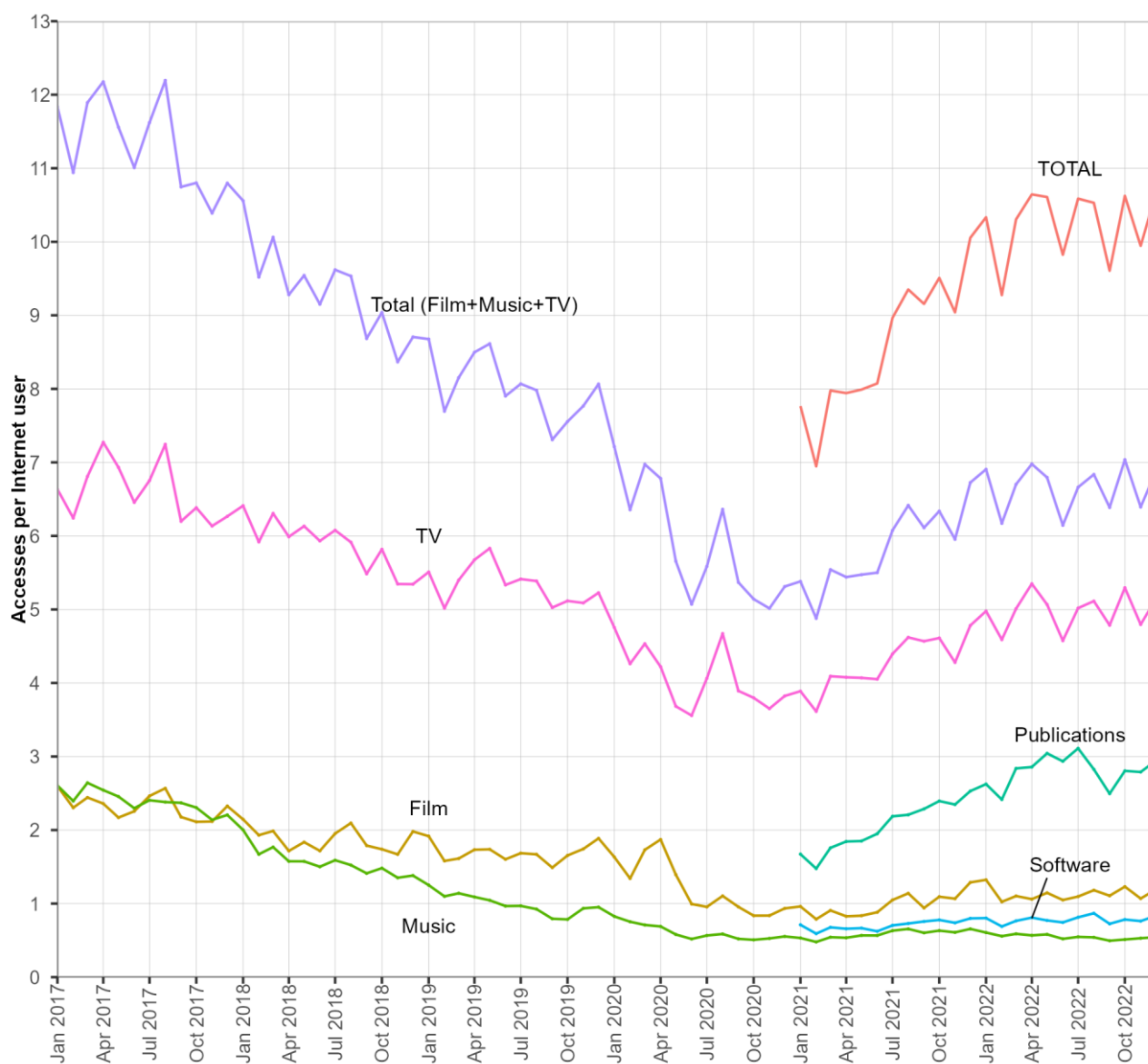
Figure 1 shows the evolution of accesses per capita for all the EU Member States. Until the end of 2020, there was a downward trend, which has since reversed due to a surge in pirated accesses to TV content, affecting not just TV shows but also films. The data indicates a stabilisation in music accesses at approximately one fifth of the levels recorded in 2017. This change in trend occurred across all the EU Member States (see annexes). Moreover, the chart shows pirated accesses to

<sup>(25)</sup> The genre category is new in the 2021 and 2022 datasets.

<sup>(26)</sup> The accesses originated by 'Mail' and 'Display Ads' have been aggregated in this study, since the figures are very small.



publications and software. While software piracy has remained stable, pirated accesses to publications nearly doubled during this period, although the trend appears to be stabilising.



**Figure 1. Evolution of accesses to pirated content 2017-2022 in the EU27 (source: EUIPO calculation based on MUSO data)**

### 3.2 Eurostat: internet usage, income, population

The economic and demographic data are sourced from Eurostat, the statistical office of the EU. The present study makes use of the following tables.

- Population between 16 and 74 years old (*demo\_pjan*): the study considers the population aged 16-74 years because the ICT survey (data below) of households covers households with at least one member in the 16-74 age group.
- Individuals ( %) regularly using the internet (*tin00091*): in this context, regular use is defined by Eurostat as 'at least once a week (i.e. every day or almost every day or at least once a week but not every day) on average within the last 3 months before the survey. Use includes all locations and methods of access and any purpose (private or work/business related)'. At the EU level, the share of internet users has increased significantly between 2017 and the end of 2022 from 79 % to 88 % of the population aged 16-74 regularly using the internet. After applying this share to the total 16-74 population, the result is that about 32 million additional individuals in the EU27 started using the internet on a regular basis during the period analysed. The number of internet users is used for the calculation of pirated accesses to content per capita per country per month.

Year	EU27		EU28	
2017	261.84	79 %	306.51	81 %
2018	270.02	82 %	315.04	83 %
2019	277.64	84 %	323.85	85 %
2020	284.40	86 %	330.79	87 %
2021	288.94	87 %	-	-
2022	293.09	89 %	-	-

**Table 3. Number (million) / share of internet users aged 16-74 (source: estimations based on Eurostat data)**

- Youth unemployment (*une\_rt\_a*): this variable contains the share<sup>(27)</sup> of young people between 15 and 24 years old that are unemployed. This age range does not start at 16 years, because the Eurostat database cannot be queried by age but rather by age range. The share of unemployed people in this age category decreased from 18.5 % to 14.5 % between 2017 and 2022 in the EU27.
- Young population between 15 and 24 years old (*demo\_pjangroup*): this age range is chosen to make it consistent with the youth unemployment variable.
- Real gross domestic product (GDP) per capita (*sdg\_08\_10*) grew by 6.3 % in the EU27, while growth as well as its intensity in each EU Member State was uneven.
- Gini index<sup>(28)</sup> (*ilc\_di12*) did not significantly vary in the EU27 and in the Member States. In addition, the gap between the lowest and the highest Gini index remains high (about 17 %).

In order to compare the data between countries, the intensity of piracy has been calculated by dividing the number of accesses by the number of internet users, more precisely the population aged between 16 and 74 years who access the internet at least once a week.

### 3.3 European Audiovisual Observatory and Pro-music

The European Audiovisual Observatory provides statistical and analytical information on film, television, video/DVD, new audiovisual media services and public policy related to film and television. In the framework of its collaboration with the European Commission, it created the MAVISE database<sup>(29)</sup> of TV and on-demand audiovisual services and companies across Europe.

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<sup>(27)</sup> The share of people aged 15-24 years in the total labour force in that age range.

<sup>(28)</sup> The Gini coefficient is a measure of income inequality in a country. It ranges between 0 and 1, with 0 denoting complete equality and 1 complete inequality.

<sup>(29)</sup> MAVISE is a free-access database on television channels and on-demand services and licences in 41 European countries and Morocco, providing information about audiovisual services available in Europe, including the licensing country and the owners and registries of licences issued by European audiovisual regulatory authorities. The MAVISE database, managed by the European Audiovisual Observatory, is supported by the CREATIVE EUROPE programme of the European Union. See <http://mavise.obs.coe.int/> and <http://mavise.obs.coe.int/pages/about> for a description of the database.

For this study, the number of video platforms and TV channels in each EU Member State was obtained from this database.

The European Audiovisual Observatory maintains information on the various audiovisual services and licences in Europe. The following tables show a summary (excluding traditional TV channels) of the availability of the various types of offers across the EU in May 2023.

The total number of video platforms in the EU and the UK, which includes platforms that provide services to customers at the pan-European level, almost quadrupled between 2018 and 2020, and doubled from 2020 to 2023.

Targeted country <sup>(30)</sup>	2018	Variation 2018-2020	2020	Variation 2020-2023	2023**
AT	46	94	140	354	494
BE	51	79	130	95	225
BG	21	107	128	123	251
CY	15	95	110	89	199
CZ	25	102	127	183	310
DE	70	94	164	80	244
DK	46	96	142	90	232
EE	17	107	124	92	216
EL	17	97	114	103	217
ES	57	84	141	123	264
FI	38	106	144	82	226
FR	96	186	282	280	562
HR	23	94	117	103	220
HU	29	95	124	248	372
IE	33	94	127	128	255
IT	33	93	126	88	214
LT	22	112	134	91	225
LU	18	98	116	111	227
LV	20	100	120	107	227
MT	11	95	106	91	197
NL	43	87	130	128	258
PL	63	82	145	468	613
PT	31	94	125	98	223
RO	22	96	118	101	219
SE	49	137	186	90	276

<sup>(30)</sup> Including pan-European services.

SI	19	102	121	106	227
SK	22	94	116	193	309
<b>TOTAL EU-27</b>	<b>937</b>	<b>2 720</b>	<b>3 657</b>	<b>3 845</b>	<b>7 502</b>
UK	111	54	165	309	474

Table 4. Number of online video platforms in the EU (source: European Audiovisual Observatory/MAVISE).

Country	2018	Variation 2018-2020	2020	Variation 2020-2023	2023*
AT	22	1	23	6	29
BE	19	1	20	6	26
BG	13	0	13	5	18
CY	8	0	8	3	11
CZ	17	-2	15	5	20
DE	33	-11	22	5	27
DK	13	1	14	5	19
EE	9	0	9	4	13
EL	15	0	15	3	18
ES	22	3	25	11	36
FI	12	0	12	5	17
FR	31	-1	30	14	44
HR	4	5	9	2	11
HU	14	0	14	4	18
IE	19	0	19	8	27
IT	18	0	18	4	22
LT	9	0	9	4	13
LU	12	0	12	4	16
LV	9	0	9	4	13
MT	9	0	9	4	13
NL	25	-1	24	-12	12
PL	23	-4	19	4	23
PT	16	0	16	5	21
RO	11	-4	7	4	11
SE	12	2	14	8	22
SI	7	1	8	3	11
SK	11	-1	10	6	16
<b>TOTAL EU-27</b>	<b>413</b>	<b>-10</b>	<b>403</b>	<b>124</b>	<b>527</b>
UK	29	-4	25	13	38

Table 5: Number of online music platforms in the EU (source: Pro-Music).

Targeted country <sup>(31)</sup>	2018	Variation 2018-2020	2020	Variation 2020-2023	2023**
AT	1 288	132	1 420	62	1 482
BE	1 299	29	1 328	59	1 387
BG	1 311	75	1 386	41	1 427
CY	1 172	62	1 234	44	1 278
CZ	1 310	211	1 521	67	1 588
DE	1 585	77	1 662	95	1 757
DK	1 259	76	1 335	120	1 455
EE	1 212	43	1 255	58	1 313
EL	1 289	93	1 382	63	1 445
ES	1 760	-100	1 660	49	1 709
FI	1 246	10	1 256	64	1 320
FR	1 510	46	1 556	59	1 615
HR	1 300	80	1 380	81	1 461
HU	1 636	40	1 676	5	1 681
IE	1 195	112	1 307	61	1 368
IT	2 701	173	2 874	-600	2 274
LT	1 217	63	1 280	58	1 338
LU	1 158	57	1 215	70	1 285
LV	1 216	66	1 282	59	1 341
MT	1 150	66	1 216	53	1 269
NL	1 480	93	1 573	20	1 593
PL	1 331	70	1 401	58	1 459
PT	1 206	72	1 278	60	1 338
RO	1 495	56	1 551	31	1 582
SE	1 269	47	1 316	143	1 459
SI	1 294	82	1 376	78	1 454
SK	1 342	98	1 440	62	1 502
<b>TOTAL EU-27</b>	<b>37 231</b>	<b>1,929</b>	<b>39 160</b>	<b>1,020</b>	<b>40 180</b>
UK	1 619	-16	1 603	55	1 658

Table 6. Number of TV Channels in the EU (source: European Audiovisual Observatory/MAVISE)

The availability of TV channels, and therefore the offer to citizens, in the EU grew by about 2.5 %. The evolution across countries differs significantly. Although the number has decreased in Italy, the number of TV channels there remains the highest in the EU.

Concerning music products, the number of platforms operating in each EU member state was obtained from the Pro-music website<sup>(32)</sup>.

Although the number of music platforms in the EU decreased slightly between 2018 and 2020, it grew by about 32 % between 2020 and 2023. This increase in the legal offer of music platforms occurred in a large majority of the EU Member States and the UK, with the exception of Germany and the Netherlands, where the legal offer decreased. It remained stable in Poland and Romania.

Overall, the legal offer of TV channels, films and music has significantly increased in most EU Member States since 2018. Additional information on the legal offer is available on the EUIPO's [Agorateka](#)<sup>(33)</sup> portal.

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<sup>(31)</sup> Including pan-European TV channels.

<sup>(32)</sup> From the Pro-music.org website: 'Pro-music is a coalition of people and organisations working across the music sector. The international alliance of musicians, managers, artists, publishers and major and independent record companies across the music industry work together to promote the myriad of different ways in which people can enjoy music safely and legitimately online'.

<sup>(33)</sup> Agorateka is a pan-European portal of the European Intellectual Property Office (EUIPO), created through the European Observatory on Infringements of Intellectual Property Rights. It provides links to sites for music, film & television, ebooks, video games and sports events.

### 3.4 IP Perception study

Besides the socioeconomic and market variables mentioned above, this study addresses the influence of the IP Perception variables on piracy. The related dataset is a subset of the EUIPO's IP Perception surveys<sup>(34)</sup>. The most recent IP Perception study was published in 2023<sup>(35)</sup>.

The study aims to understand the extent of Europeans' respect for IP rights and their overall perception of IP. The report draws its conclusions from 25 824 interviews conducted with individuals aged 15 and above residing in all the EU Member States.

Several variables from the IP Perception survey are used in the econometric analysis. These variables can be divided into two groups (see Table 7).

<b>Attitudes towards piracy</b>	Q3.6	To what extent do you agree or disagree with the following statements?
		- It is acceptable to obtain digital content illegally from the internet or from apps when it is for my personal use.
<b>Awareness of legal offer</b>	Q4b.2	During the past 12 months, which of the following have you done?
		- Paid to access, download or stream copyright protected content from a legal service on the internet or from Pay TV operators (for instance music, video, film or TV series, ebooks or audio books)
	Q6.1	Among the types of content listed below, for which one(s) are you aware of legal offers accessible in your country to access or download/stream them on the internet?
		- Music
	Q6.2	- Films
	Q6.3	- TV series

**Table 7. Variables from the IP perception survey**

<sup>(34)</sup> Four surveys so far: 2013, 2017, 2020 and 2023.

<sup>(35)</sup> EUIPO IP Perception study 2023.



## 4 Descriptive analysis

This section provides an overview of the data regarding the consumption of pirated content from January 2017 to December 2022.

The graphs illustrate the progression of overall piracy across all EU Member States, the UK, and the EU27 average, as well as a breakdown per content type, source, genre and device type. First, the evolution of aggregated piracy is presented; the subsequent sub-sections show the results by type of content (TV, Films, Music, Software and Publications).

As explained in Section 3, the basic unit of observation is the number of accesses to pirated content per internet user per month. As shorthand, the expressions ‘piracy’ or ‘consumption of pirated content’ are used throughout this report. In all cases, these expressions are mere stylistic devices and always refer to the original definition.

### 4.1 Evolution of pirated consumption of all types of content

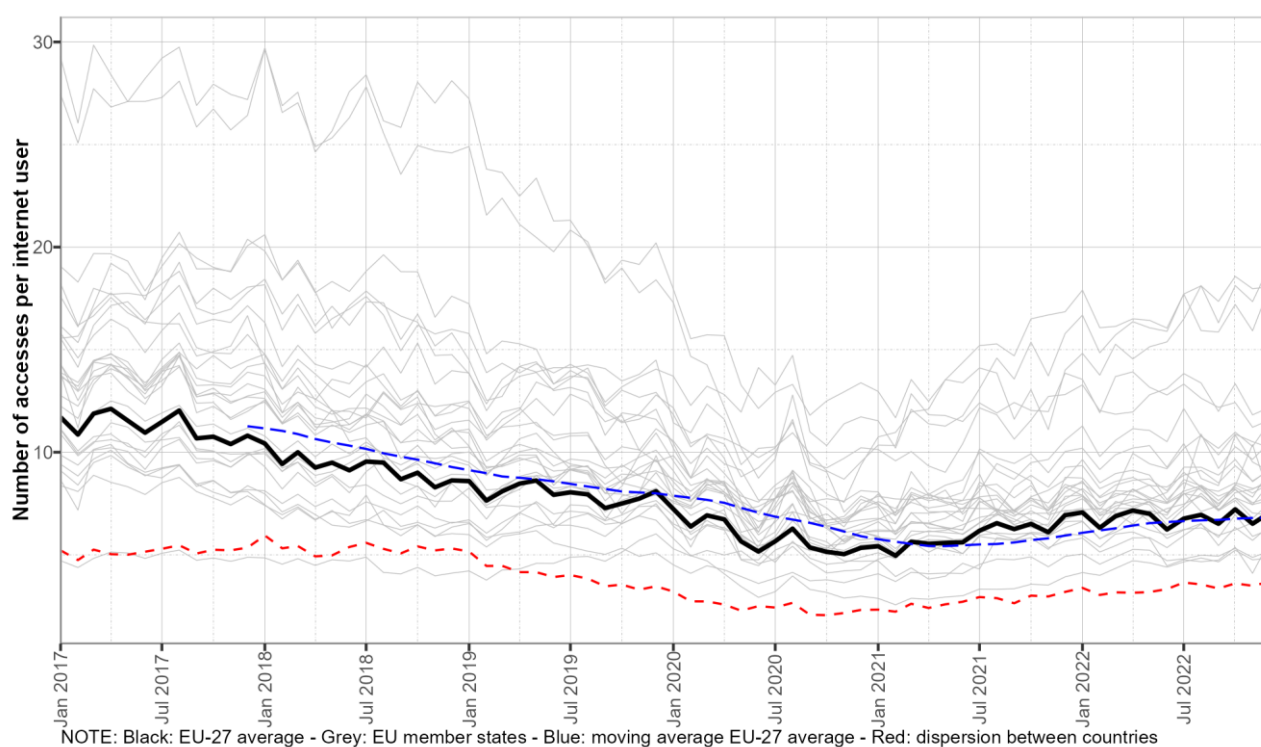
This section investigates the total piracy for all types of content. Each type of piracy is different. For example, to what extent can one say that the accesses for downloading a song, a book and a film are equivalent? With this caveat, this section considers that all accesses have the same weight and are simply added up.

The conclusion of the previous issue of this report was that piracy had been slowly declining over the years up to the end of 2020. However, this positive trend now seems to have reversed.

Figure 2 shows that piracy dropped continuously between 2017 and the beginning of 2021, when the trend seems to have reversed, both for the EU as a whole (the solid line) and for most Member States (the grey lines). Although at the EU27 level 2022 ended at about 7 accesses per internet user per month, this value remains low compared to the maximum level of March 2017. While the trend

was decreasing, there was convergence between countries. The change of trend seems to be accompanied by a divergence between countries (the red line is the evolution of the variability<sup>(36)</sup> across countries).

Moreover, the EU27 moving average (shown by the dotted blue line) seems to have stabilised. One important question is whether this change of trend in the evolution of total piracy is due to one particular domain or whether it is generalised. Figure 3 shows the evolution of the share of each content type in total piracy. TV piracy has increased in importance over the years, from about 59 % to 73 %, while music's share declined from 20 % in 2017 to 9 % in 2022. The share of film piracy saw a slight decrease from 20 % to 18 % during the same period.

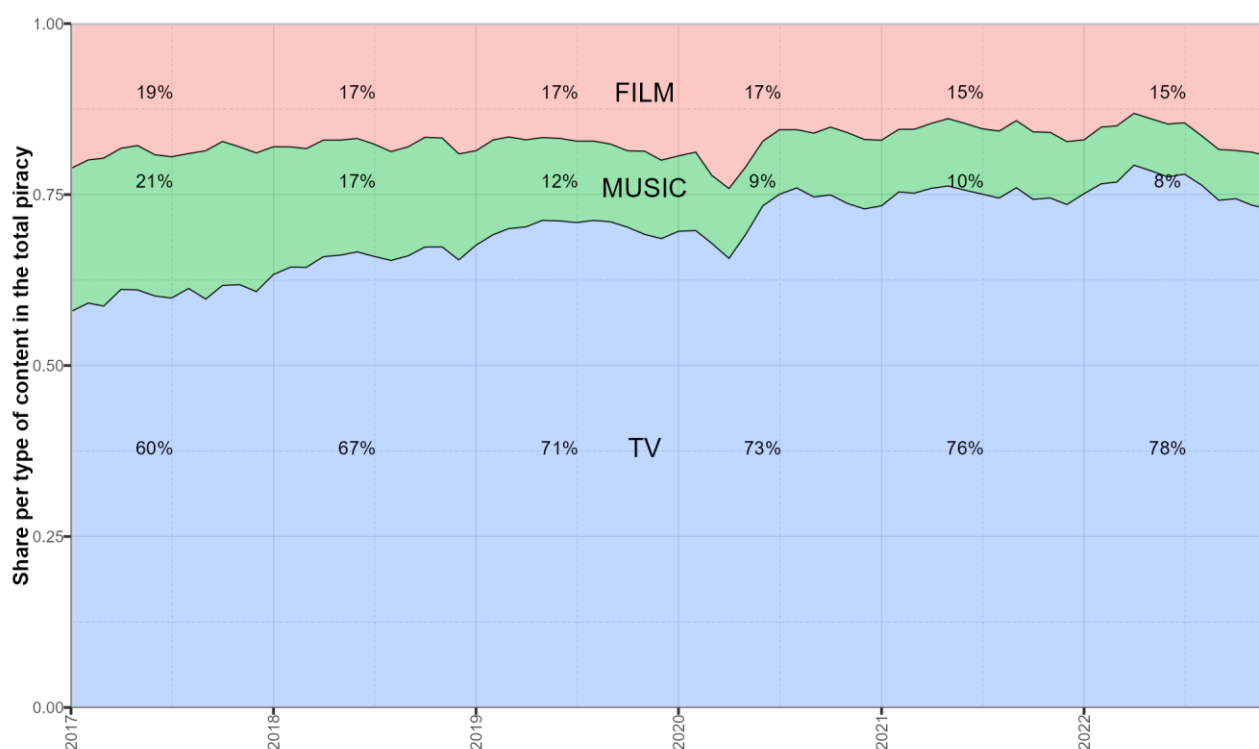


**Figure 2. Evolution of total accesses per internet users (EU member states, UK, EU27 and 12-month moving average; the red line represents the standard deviation as a measure of the variability between countries)**

<sup>(36)</sup> Measured as the standard deviation per month for the EU27 Member States.

Figure 4 illustrates the seasonally adjusted<sup>(37)</sup> progression of overall piracy over time, with a continuous decline until early 2021. A slight upward trend started at the beginning of 2021 and concluded at the beginning of 2022, at which point the curve seems to have stabilised.

To visually compare the second quarter of each year with that of 2020 (when the COVID-19 pandemic started), the figure highlights these periods. Following a visual analysis of the chart as well as the table of second-quarter growth rates, one conclusion is that 2020 and 2021 had significantly different variations from all the other years, albeit in different directions. While the start of the COVID-19 pandemic coincided with a decrease in piracy of 21 %, the second quarter of 2021 showed an increase of more than 8 %.



**Figure 3. Evolution 2017-2022 of content type shares of total piracy**

<sup>(37)</sup> From [EUROSTAT's glossary](#): 'Seasonal adjustment (or the adjustment of seasonal changes) is a statistical method for removing the effects of recurring seasonal influences which have been observed in the past from an economic time series, thus showing non-seasonal trends more clearly'. The methodology used in this study for the decomposition of time series was TRAMO-SEATS implemented in the RJDemetra R package.

Year	Total	TV	Film	Music	Publications	Software
2018	-17.5 %	-10.7 %	-20.3 %	-34.5 %	-	-
2019	-14.0 %	-9.1 %	-11.0 %	-36.6 %	-	-
2020	-25.8 %	-22.9 %	-28.3 %	-37.9 %	-	-
2021	-8.8 %	-6.9 %	-18.0 %	-3.7 %	-	-
2022	+13.3 %	+15.3 %	+17.2 %	-6.0 %	+37.1 %	+10.7 %

Table 8. Annual EU27 per capita piracy growth rates by content type

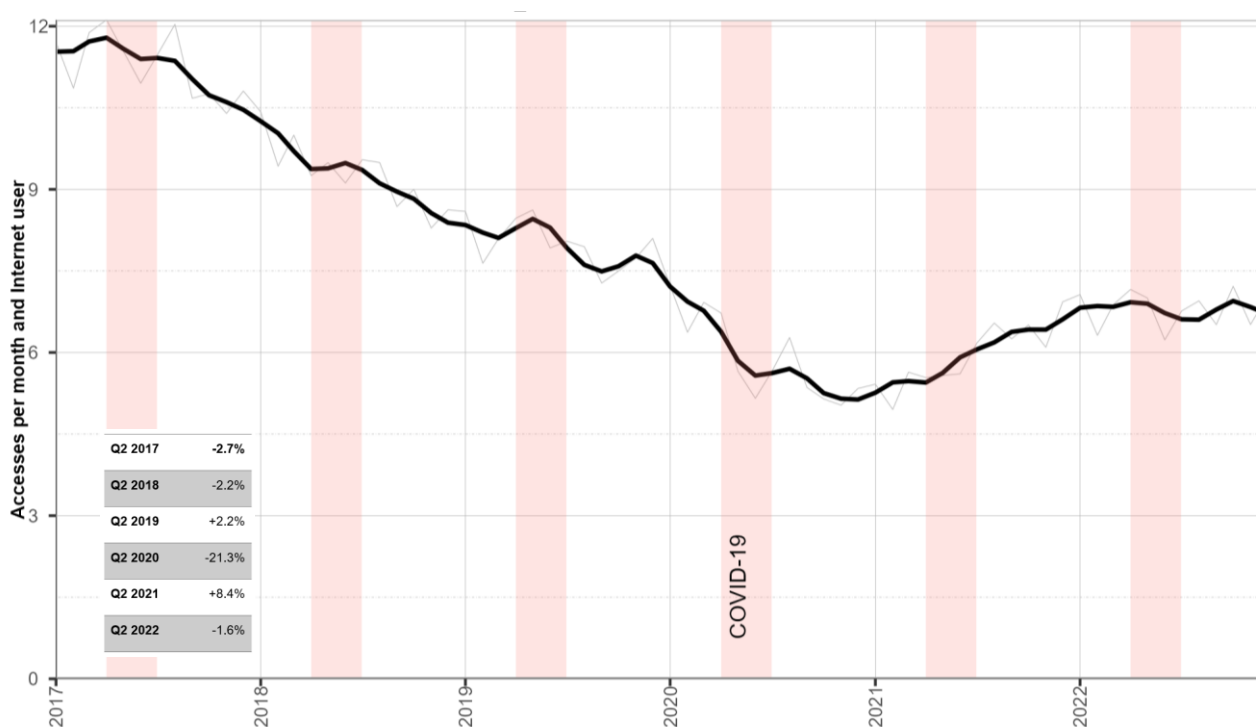


Figure 4. Seasonally adjusted evolution of total piracy in the EU27 and variation in second quarters

Table 8 shows the annual growth of piracy by type of content and in total. The total growth rate of 13 % is mainly due to TV piracy, although film piracy also contributed to a lesser degree. On the other hand, music piracy continued its decrease, albeit at lower rates of decline in 2021-2022 than in previous years.

Figure 5 shows the distribution of piracy among the types of content as well as the proportion of piracy per type of content that is consumed either on mobile<sup>(38)</sup> or on desktop devices.

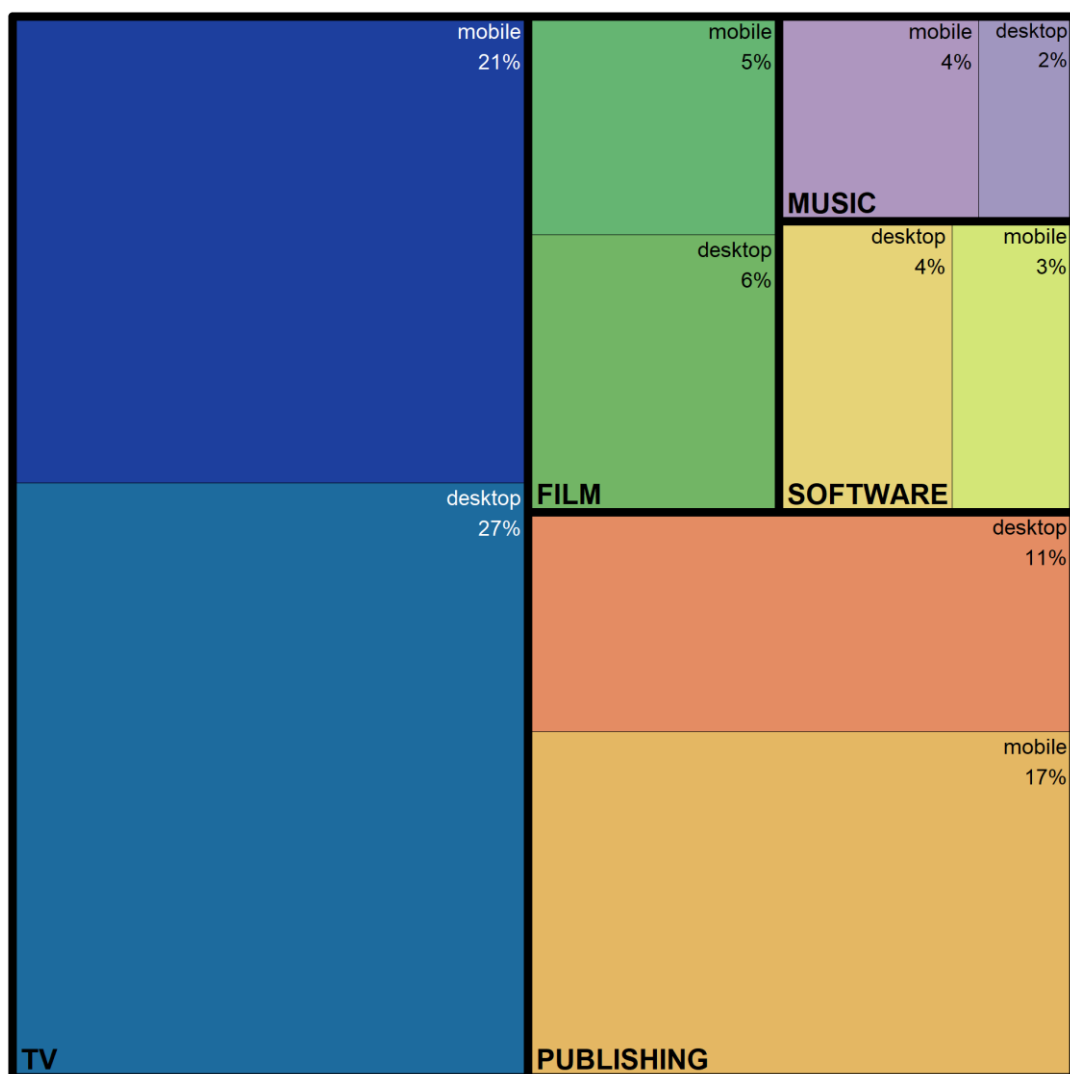


Figure 5. Total 2022 EU27 piracy proportion per type of content, with split per device

<sup>(38)</sup> The distinction between mobile and desktop device is based on the operating system that connects to the pirate website. These devices can be mobile phones, tablets or any other device with a mobile operating system.

There is a clear tendency to consume pirated music and publications content on mobile devices, while for TV accesses, piracy from desktop computers is preferred, although accesses from mobile devices are also significant.

In relation to the consumption of pirated content by device type (Figure 6), there has been a noticeable shift in favour of mobile devices over time. The trend observed between 2017 and mid-2020 reveals a more significant decline in desktop-based piracy compared to that on mobile devices. Nevertheless, the decrease in piracy on mobile devices continued until the end of 2020. This could be attributed to the measures implemented by Member States during the COVID-19 crisis, which led to citizens spending more time at home. The current situation seems to be very similar to 2017.

Another question that arose during the research phase of this study was whether there is seasonality in the consumption of pirated content. Figure 7 shows, for each year, the evolution of the average daily<sup>(39)</sup> accesses per user per month, taking January of each year as the baseline for the whole year.

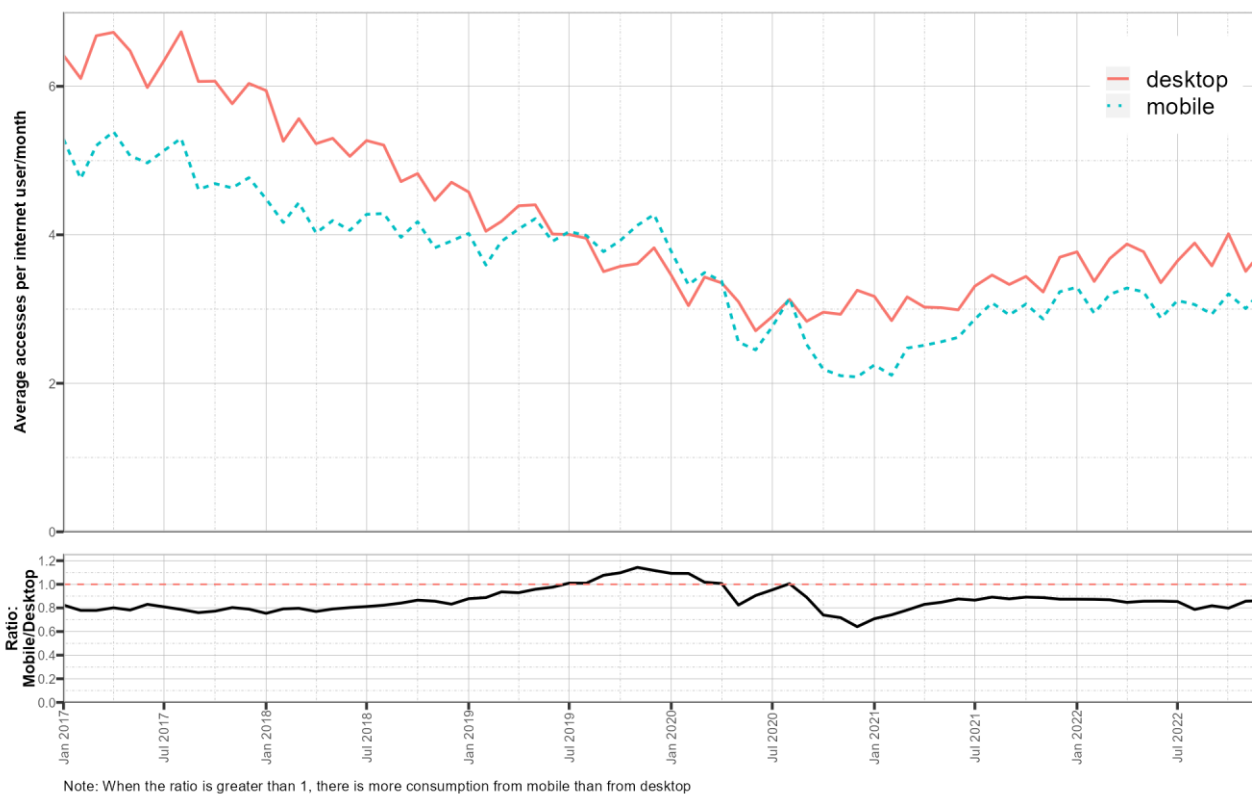
Figure 7 shows a decreasing trend between the beginning and the end of the years 2017 to 2020. However, 2021 behaved in the opposite manner, and the average daily accesses per internet user increased throughout the year. 2022 exhibits a rather steady profile, with no significant variation compared to January of that year.

The type of content piracy per country, as well as the total pirated content consumption per internet user, shows a large variability among the Member States (see

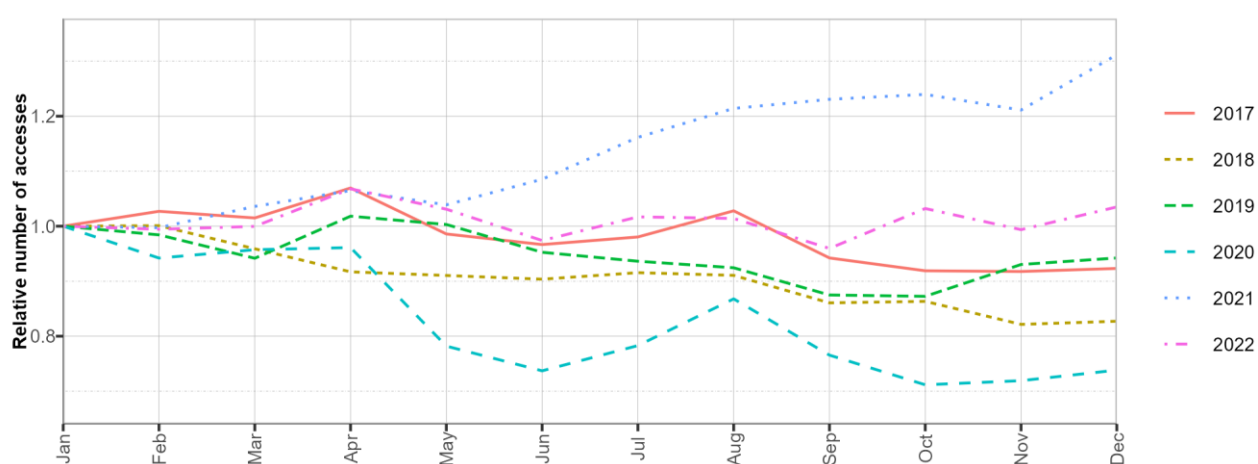
Figure 8). The total ranges from about 25 accesses per internet user per month in Estonia to about 7 in Germany. The four countries with the highest piracy rates are Estonia, Latvia, Lithuania and Cyprus, while the lowest rates are found in Germany, Italy and Poland.

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<sup>(39)</sup> The daily average is used to eliminate the effect of the differing number of days per month.



**Figure 6. Total piracy (software and publications not included) per internet user/month in the EU27 and the UK on mobile and desktop devices (mobile/desktop ratio in the lower panel)**



**Figure 7. Comparison of the relative average daily piracy for each month against January of each year**

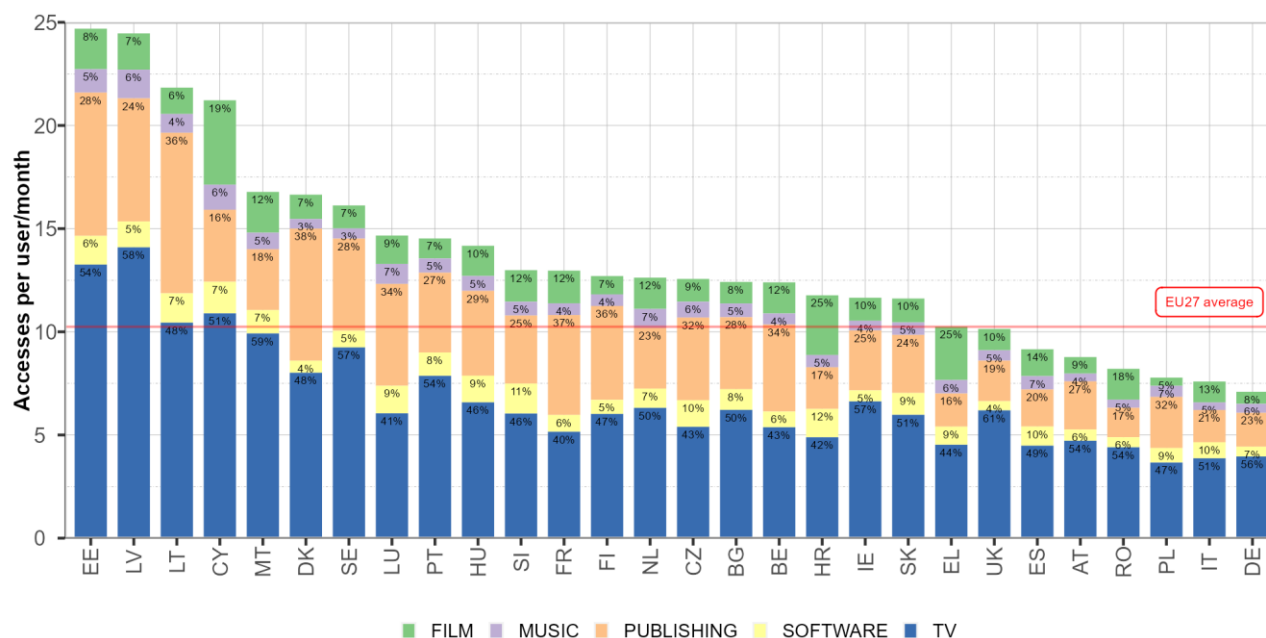
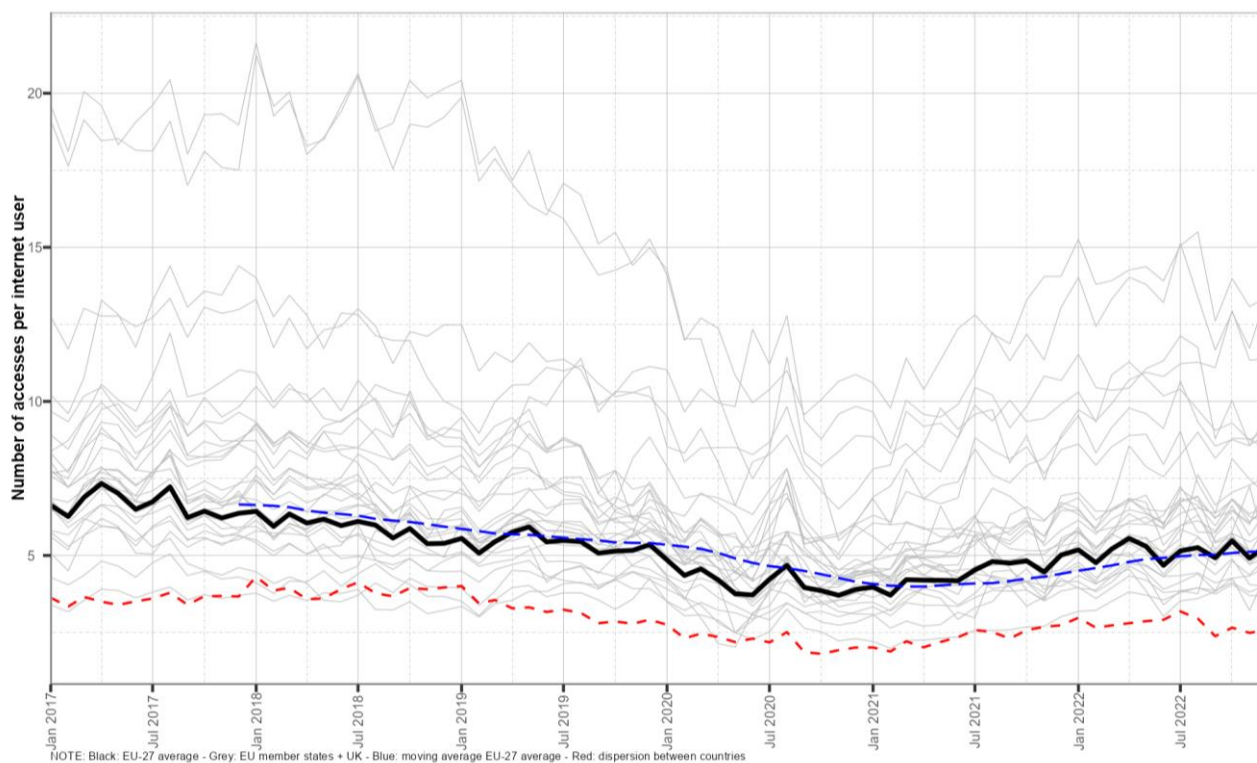


Figure 8. Breakdown per type of content in each country for 2022

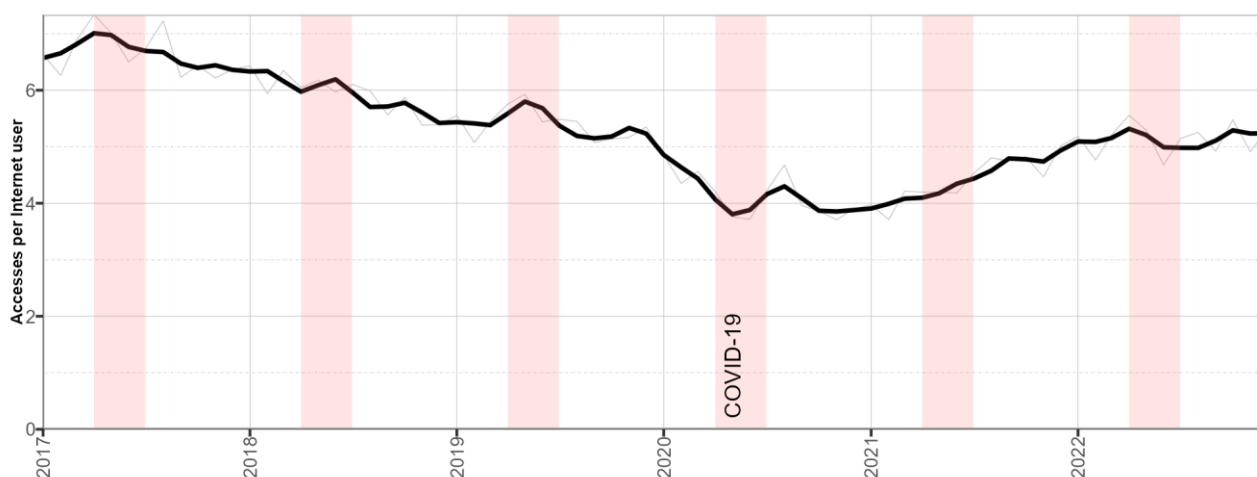
## 4.2 Evolution of TV piracy

Pirated accesses to TV content have declined in recent years. However, they started to increase again in the second half of 2021. The pirated TV consumption pattern has a similar shape in most EU Member States, although there are important variations between them and across months in several countries. Figure 9 does not indicate a change of behaviour due to the COVID-19 crisis, although the reversal of the declining trend occurred during the months that followed the crisis. Currently, the trend is nearly flat at around the average value of 5 accesses per month per internet user in the EU27, which is significantly below the 2017 level, but 20 % above the floor reached in 2020. A deeper analysis of the second quarters of each year (see Figure 10) does not clearly reveal a different pattern for 2020. However, the second quarter of 2021 was accompanied by a significant increase in TV piracy that started in the second half of 2020 and kept a continuous increase until the end of the first quarter of 2022, stabilising thereafter.



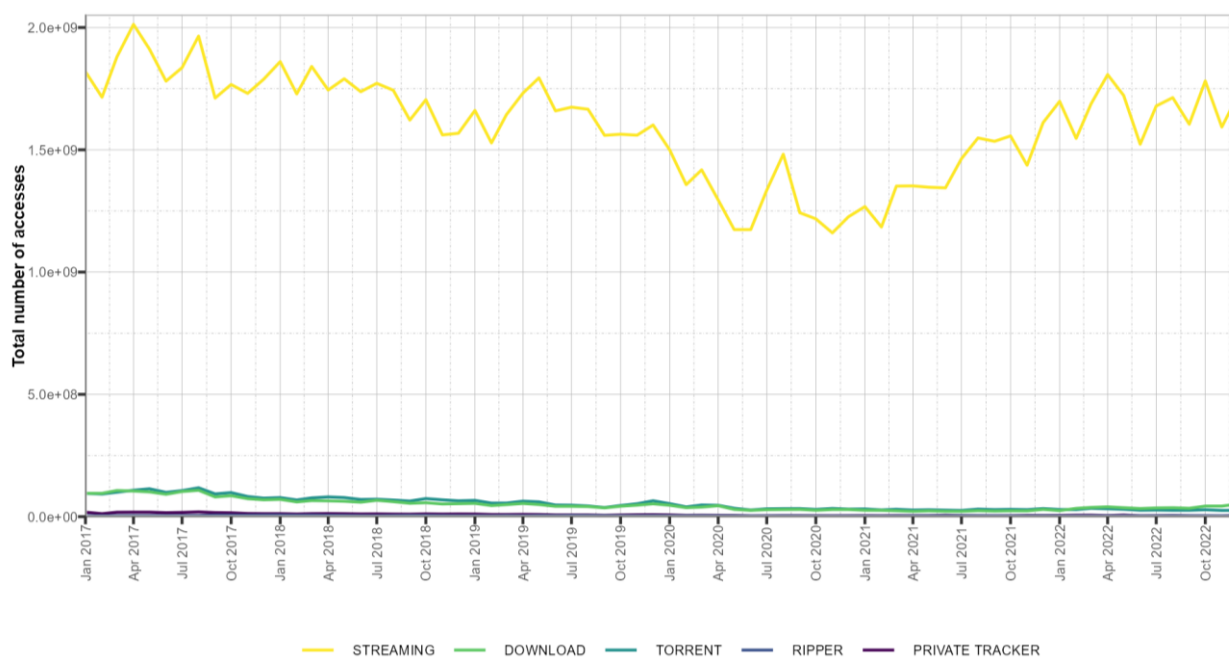


**Figure 9. Evolution in pirated TV content per country in the EU27+UK and the EU27 (12-month moving average)**

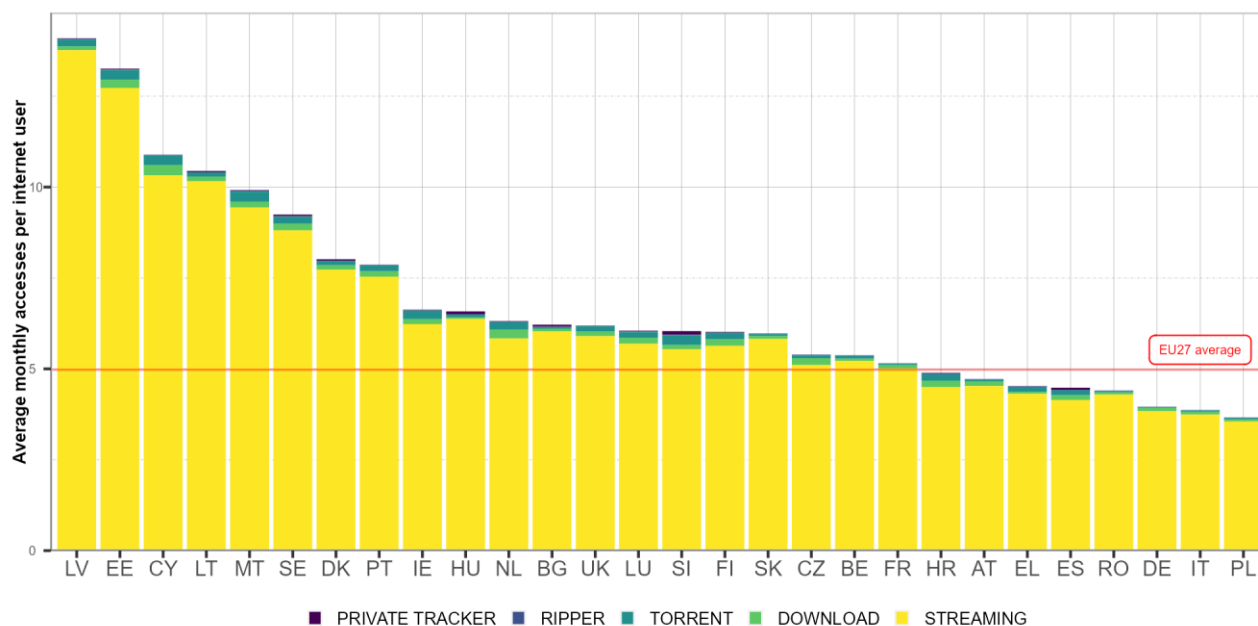


**Figure 10. Seasonally adjusted evolution of TV piracy in the EU27 (accesses per capita/month)**

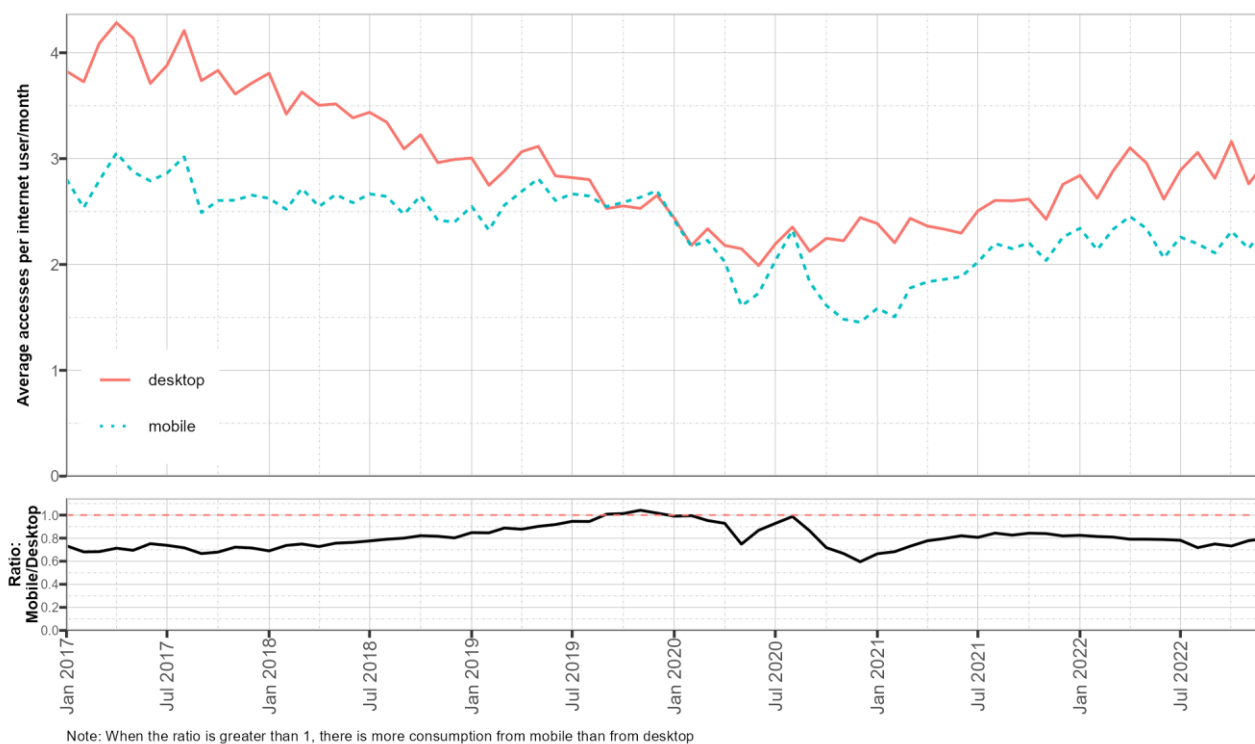
Regarding the split per access method, streaming is by far the most common way to consume pirated TV content (Figure 11). The other methods represent less than 5 % of the total accesses.



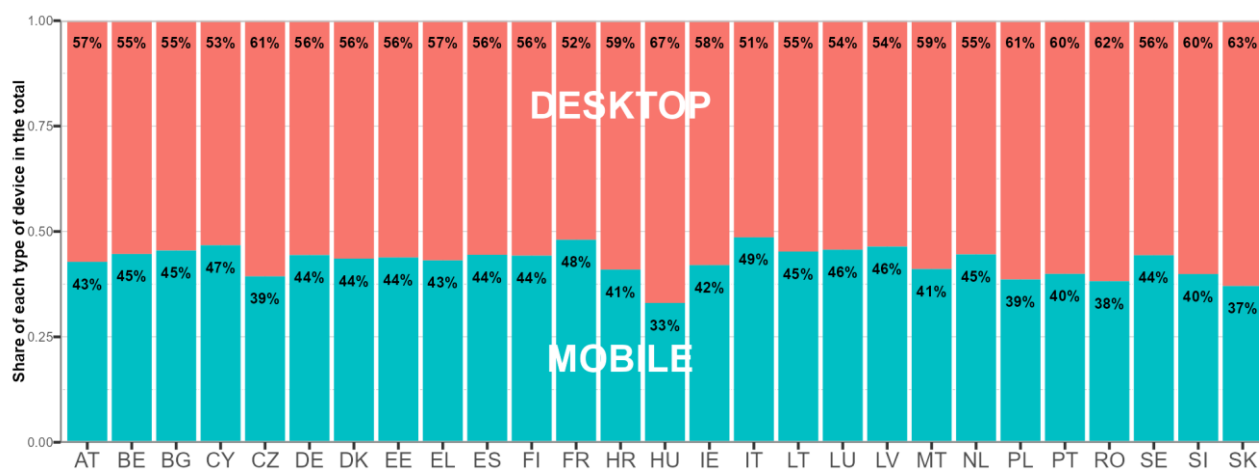
**Figure 11. Evolution of TV piracy, with breakdown per access method**



**Figure 12 Average monthly accesses to TV per country, with split per access method, 2022**



**Figure 13. Evolution of TV piracy with breakdown per device type**



**Figure 14. TV piracy with breakdown per device type and country in 2022**

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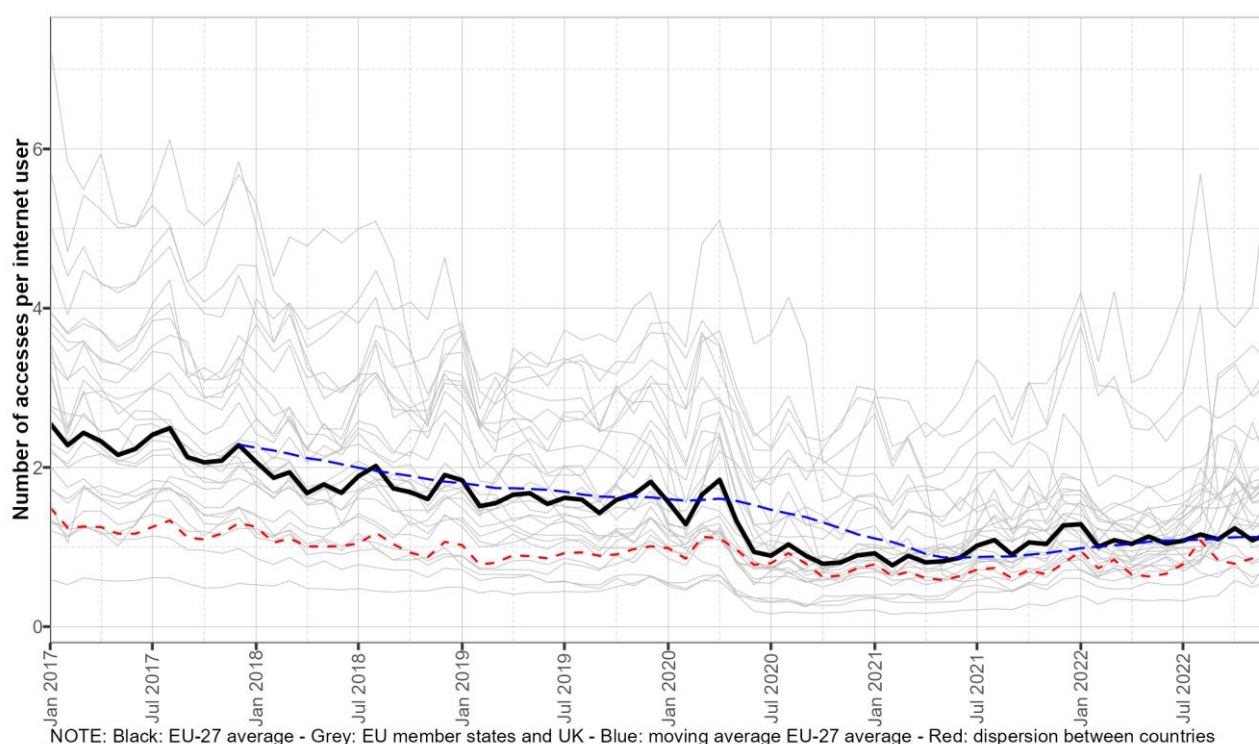
Concerning the split between mobile and desktop devices, pirated TV content on websites is usually watched on desktop devices, which represent between 50 % and 60 % of the total (

Figure 13).

The distribution between mobile and desktop piracy differs across countries, although desktop remains the most significant. The split varies between 67 % desktop in Hungary and 51 % in Italy, where consumption from mobile devices is more important.

### 4.3 Evolution of film piracy

Film content piracy accounted for approximately 20 % of overall piracy. It follows the TV domain in terms of importance.



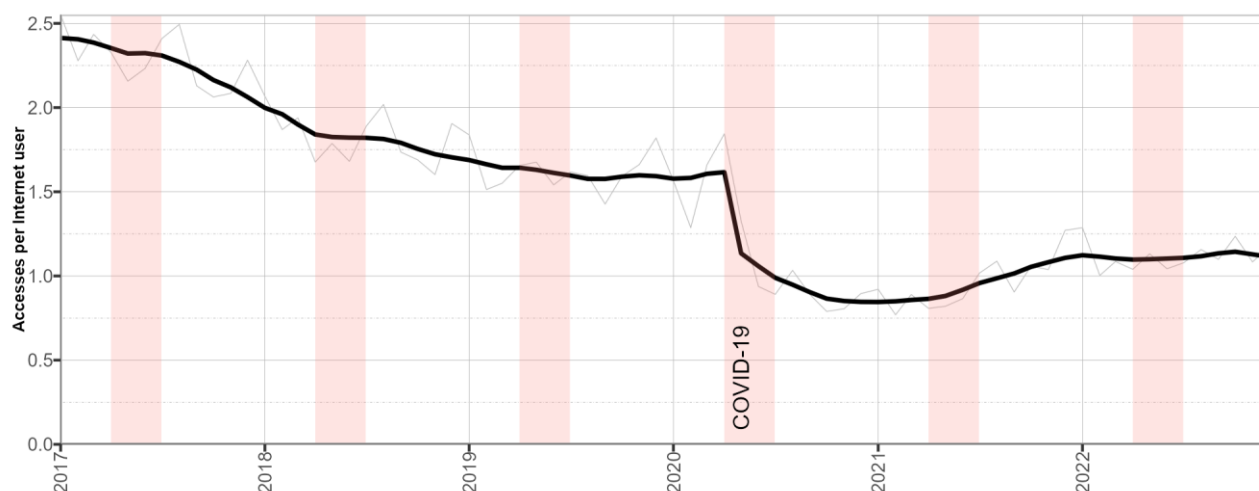
**Figure 15. Evolution of pirated film content per country in the EU27 and the UK**

Figure 15 and **Error! Reference source not found.** reveal a substantial decline during the second quarter of 2020, coinciding with the COVID-19 crisis. In only 3 months, piracy in this category decreased by nearly 40%. Beginning in July 2020, a slightly increasing trend was initiated and continued until the end of 2022. However, the end-2022 level is still below 50 % of the 2017 average.nearly 40 %.

Figure 15 also shows the evolution in the standard deviation per month (the red dashed line). This value reached a minimum in May 2021 and has been growing since then, indicating an increasing divergence among the Member States.

It remains unclear what caused the reduction in film piracy in 2020. One hypothesis is that, due to the lockdown, more EU citizens decided to subscribe to video on demand (VOD) platforms. During the preparation of this study, it was not possible to obtain the total number of subscribers of each platform in the EU27. However, a 2020 report by Netflix<sup>(40)</sup> indicates that the company added 15.69 million subscribers in EMEA<sup>(41)</sup> (Europe, Middle East and Africa). This is a record in absolute terms. Although the number of subscribers per region for other platforms was not available, their behaviours in the stock markets exchange may point to a similar situation. For example, the shares of Netflix, Disney and Amazon increased by between 22 % and 72 %, in 2020 while the S&P 500 index grew by 16 % in the same period.

All countries contributed to this very sharp decrease in film piracy between April and June 2020, as shown in Figure 17. For nearly all of them, the reduction was over 30 % compared to April 2020.



**Figure 16. Seasonally adjusted evolution of film piracy in the EU27**

<sup>(40)</sup> <https://ir.netflix.net/financials/annual-reports-and-proxies/default.aspx>.

<sup>(41)</sup> No breakdown is available for this region.

Streaming remains the main method of consuming pirated films, although other methods, such as downloading and torrenting, remain relevant (Figure 18).

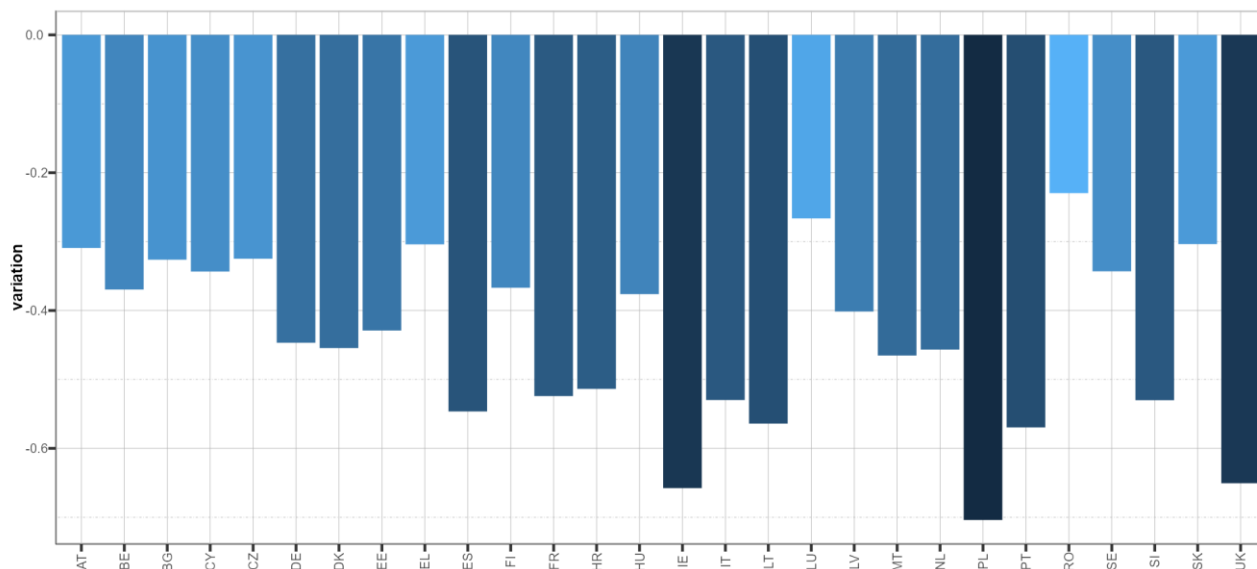


Figure 17. Decrease in film piracy per country between the end of March and the end of June 2020

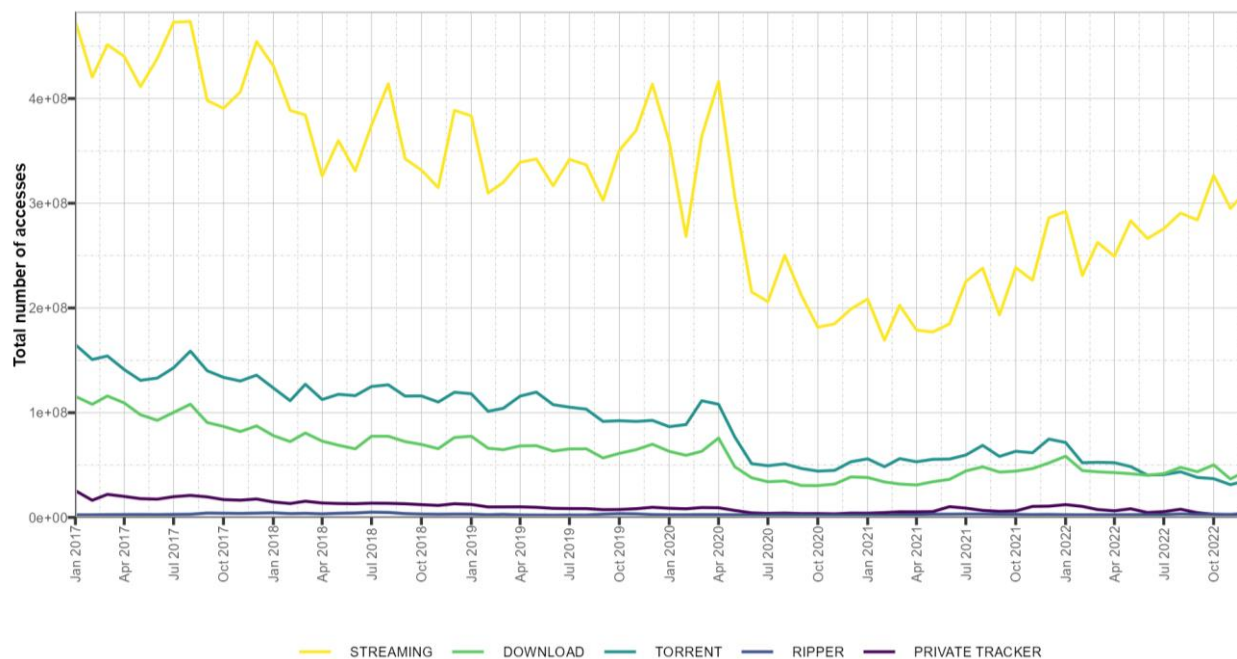
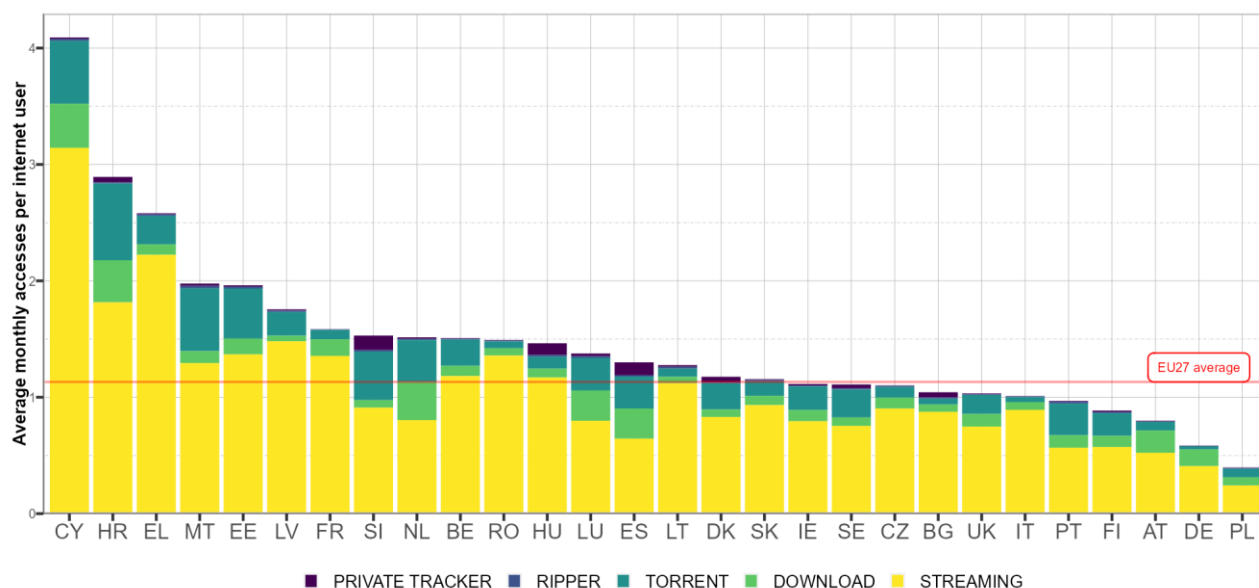


Figure 18. Evolution of film piracy broken down by method



**Figure 19. Average monthly accesses to films per country, with split per method, 2022**

While streaming began to grow at the beginning of 2021, which led to a 50 % increase between early 2021 and the end of 2022, downloads and torrents have not significantly changed their trends. It remains unclear whether this is due to a change of habits, a significant change in the pirated ‘market’ offer, or other circumstances.

Moreover, the split per method and country varies considerably. The share of streaming ranges from 50 % for Spain to 91 % for Romania.

Desktops are still the preferred devices for film piracy, although mobile devices have been continuously growing over the last year and now are just 20 % below desktop accesses per internet user in the EU. The yearly profile is similar for both types of devices, which are both growing.



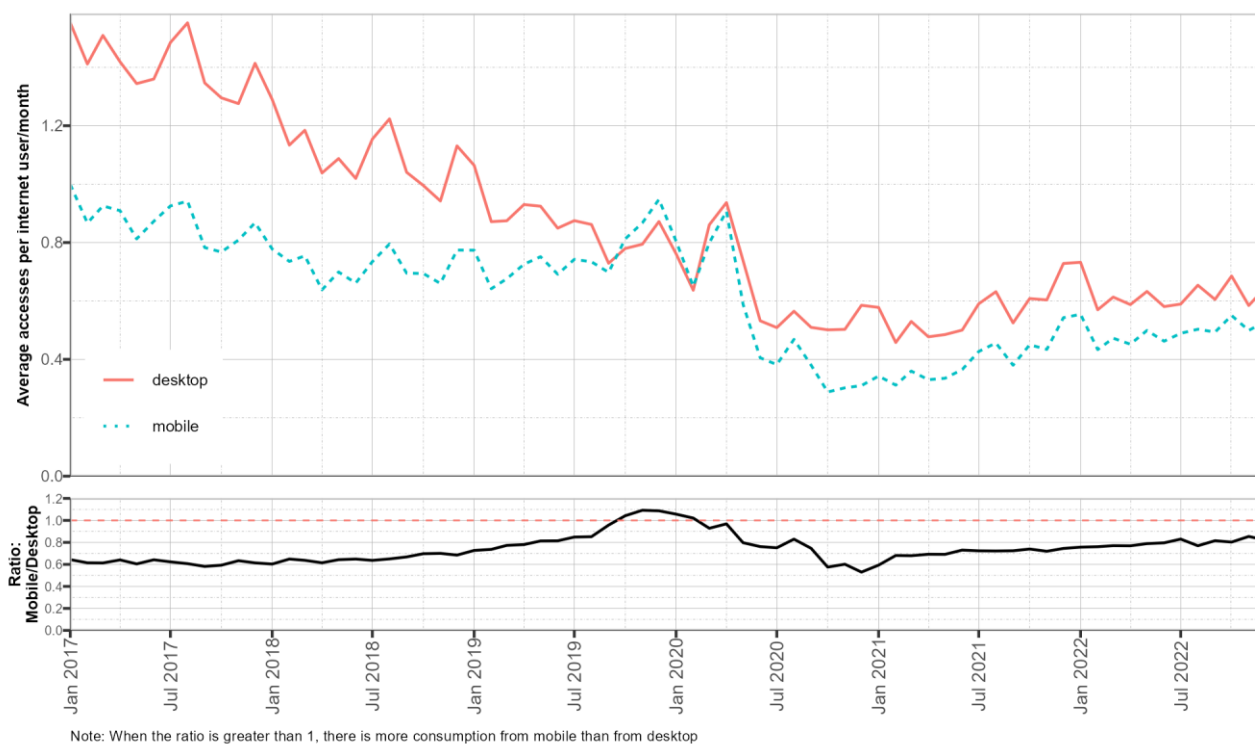


Figure 20. Evolution of film piracy with breakdown per device type

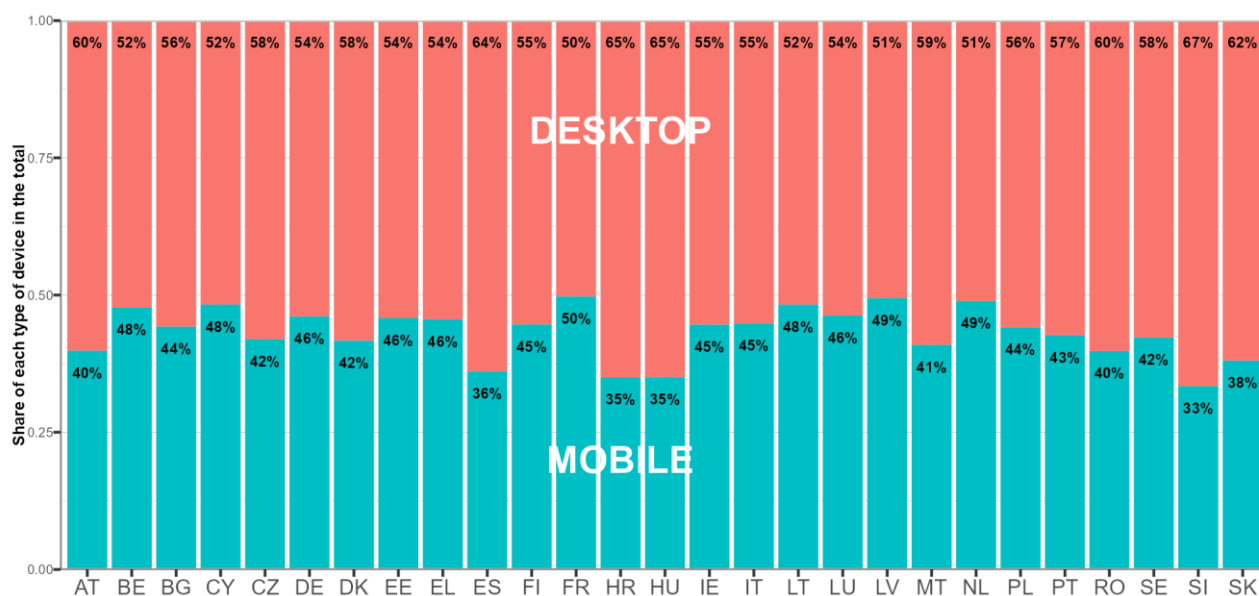


Figure 21. Film piracy with breakdown per device type and country in 2022

#### 4.4 Evolution of music piracy

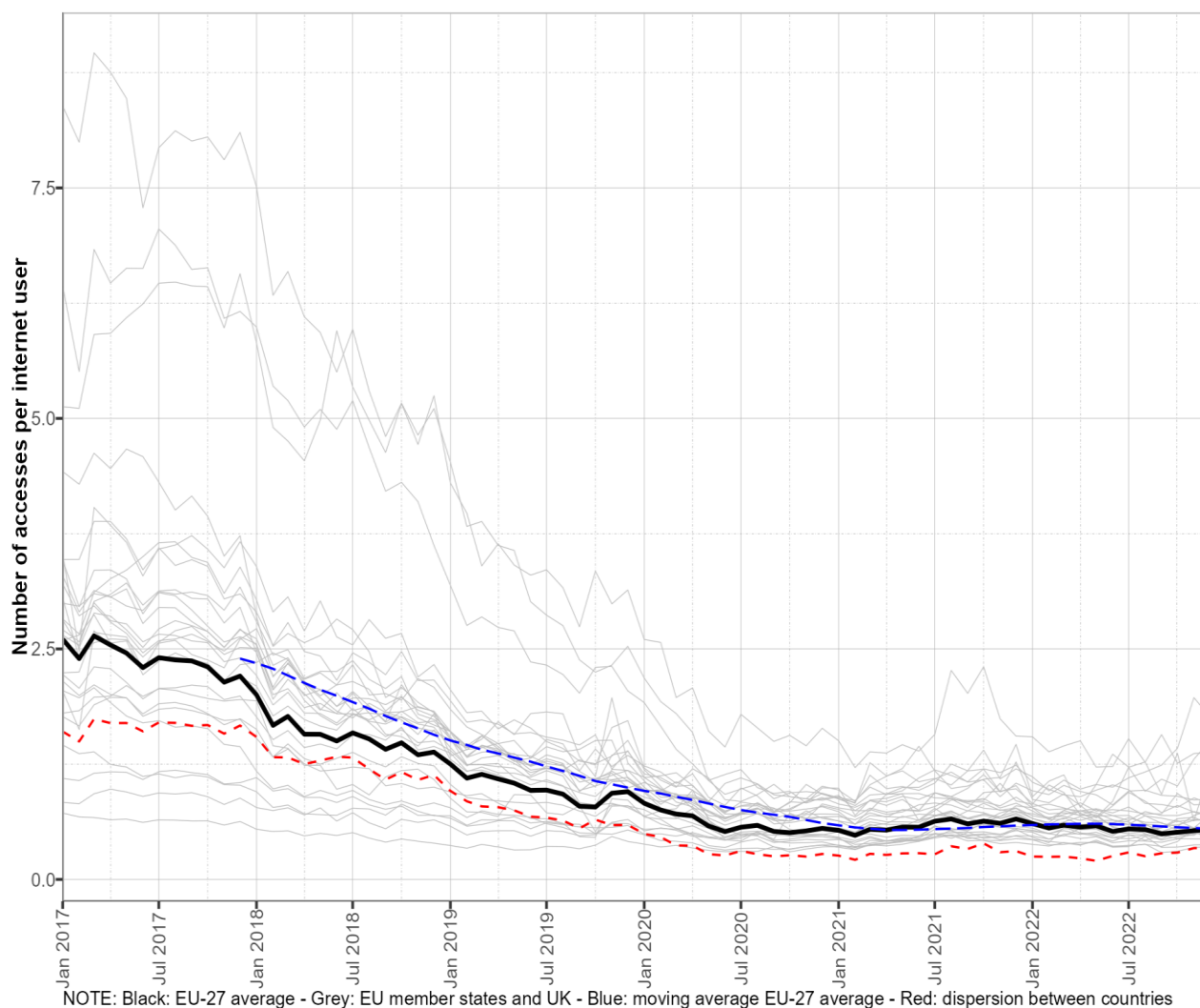
Pirated accesses to music content (Figure 22 and Figure 23) have been at a constant level since mid-2020, at about one fifth of the 2017 level. In addition, the variability between countries, which was significant until early 2020, is now converging around the EU27 value.

During the second half of 2020 the decreasing trend in music piracy halted. Despite the coincidence in time, it has not been possible to establish a link with the COVID-19 pandemic.

The preferred method for accessing pirated music content is ripping (Figure 24), which accounted for more than one third of the total accesses to pirated music content, while downloading and streaming each accounted for about one quarter of accesses.

Ripping and torrenting have followed a decreasing trend since 2017. However, streaming and downloading have been slightly increasing since the end of 2020. The current flat total curve is a reflection of the decrease in ripping and the slight increase in streaming and downloading.

Regarding the breakdown per country, ripping is the preferred method for pirated music consumption in most of them, although in some cases streaming and downloading are at similar levels.



**Figure 22. Evolution of music piracy per country in the EU27 + UK and the EU27 (12-month moving average)**

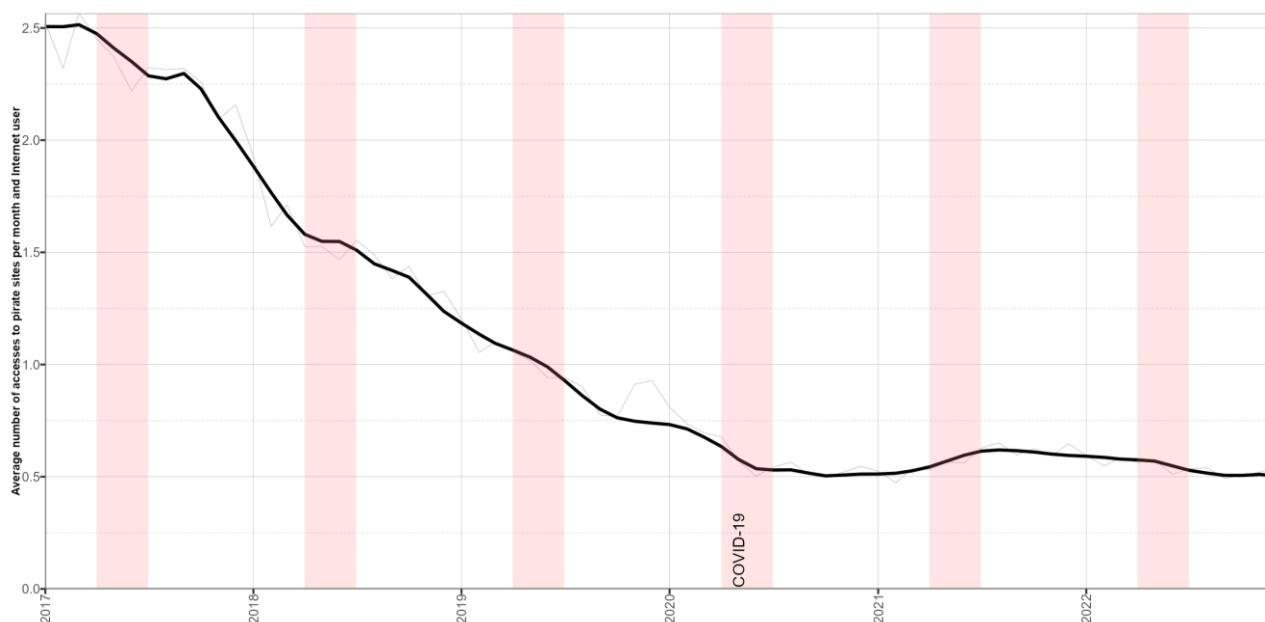


Figure 23. Seasonally adjusted evolution of music piracy in the EU27

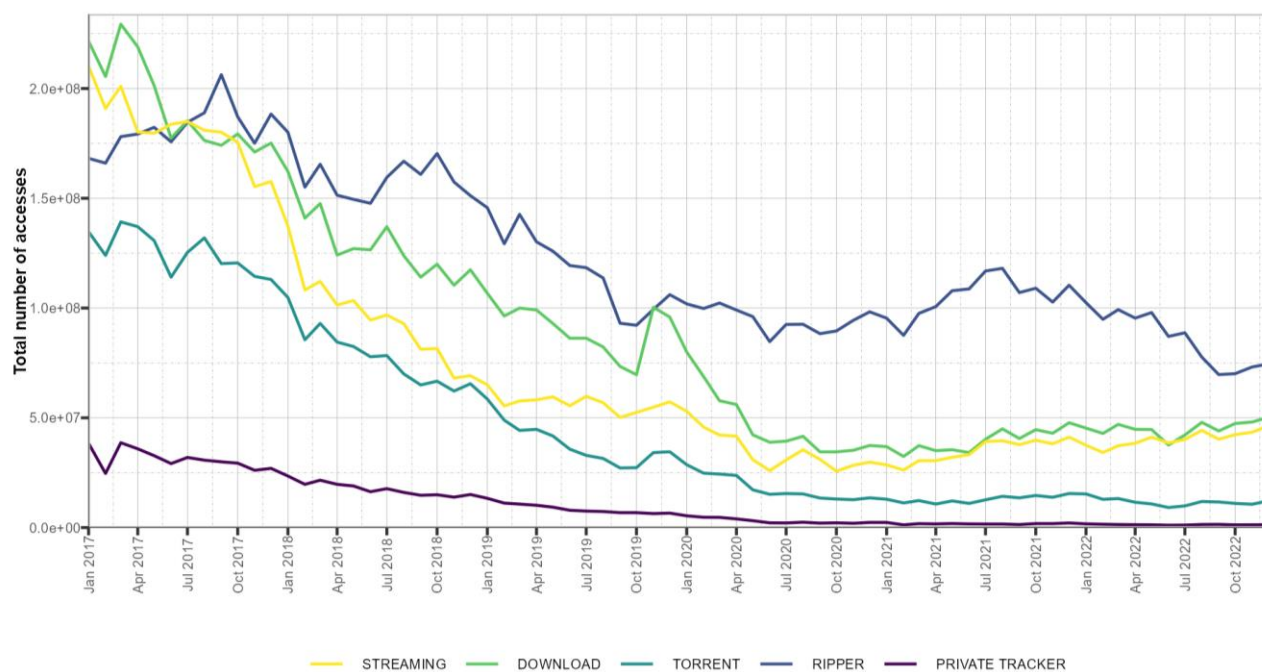


Figure 24. Evolution of music piracy in the EU27 with a breakdown by method.

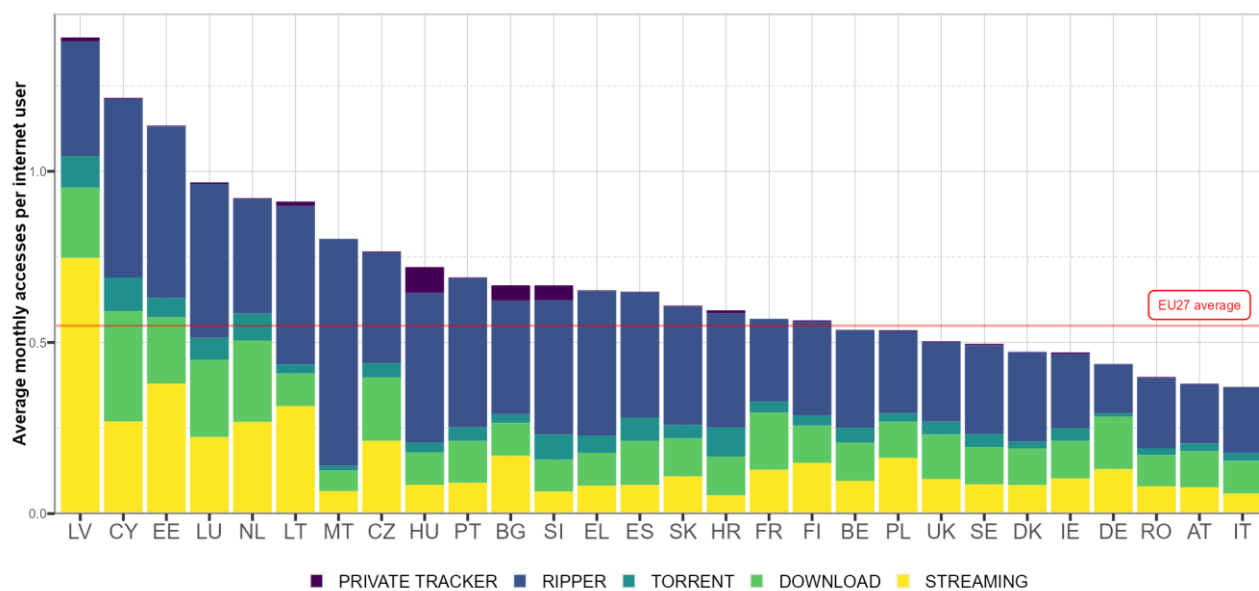


Figure 25. Average monthly accesses to music per country, with split per method, 2022

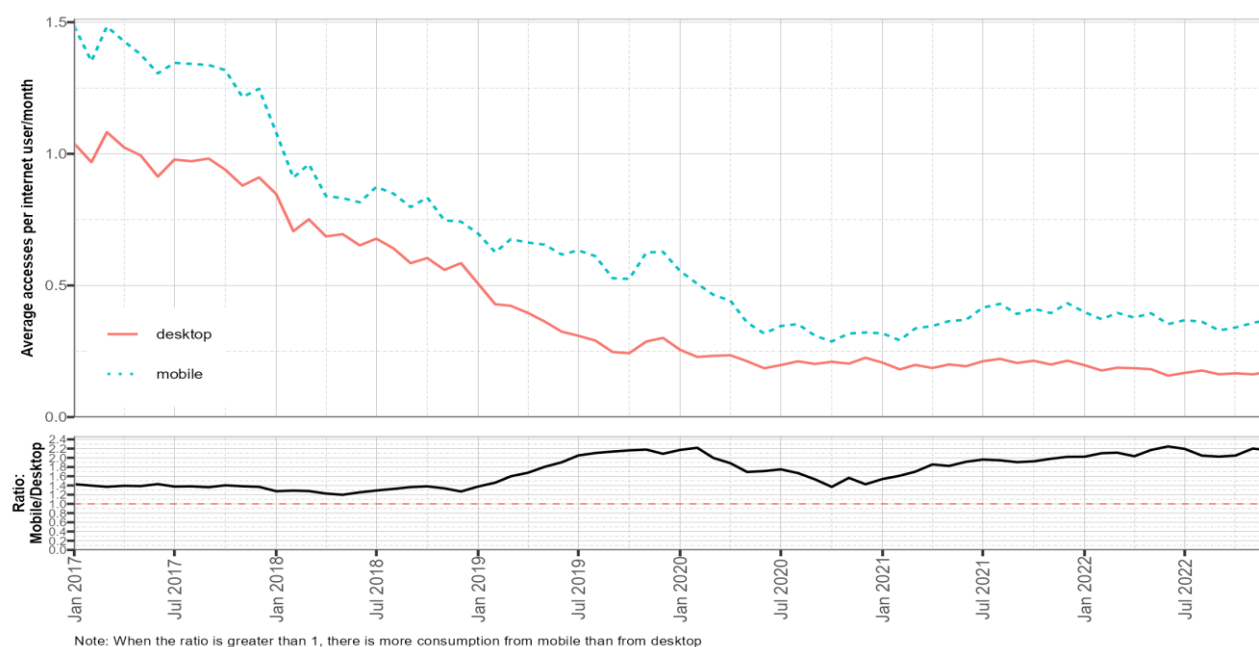


Figure 26. Evolution of music piracy with breakdown per device type

Mobile devices are the preferred option to consume pirated music content, with twice as many accesses from mobile devices as from desktop devices. The two curves have shown similar trends in the past. However, although accesses from desktop devices are slowly declining, mobile access showed a slight increase in the second half of 2022.

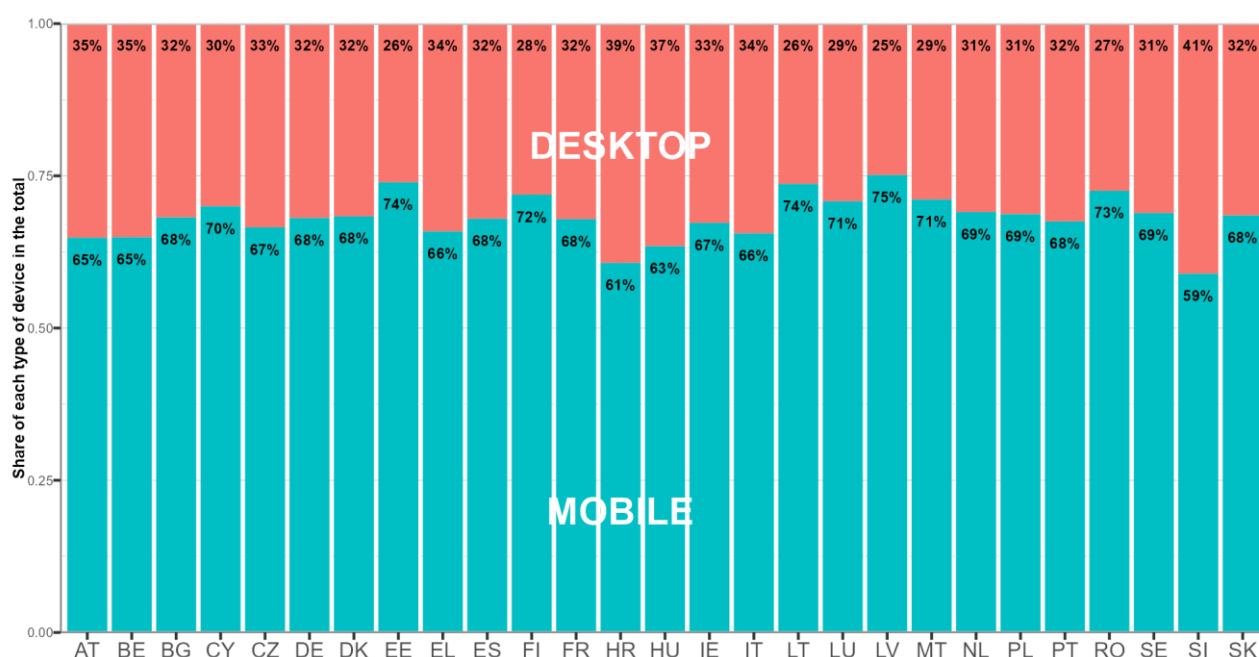
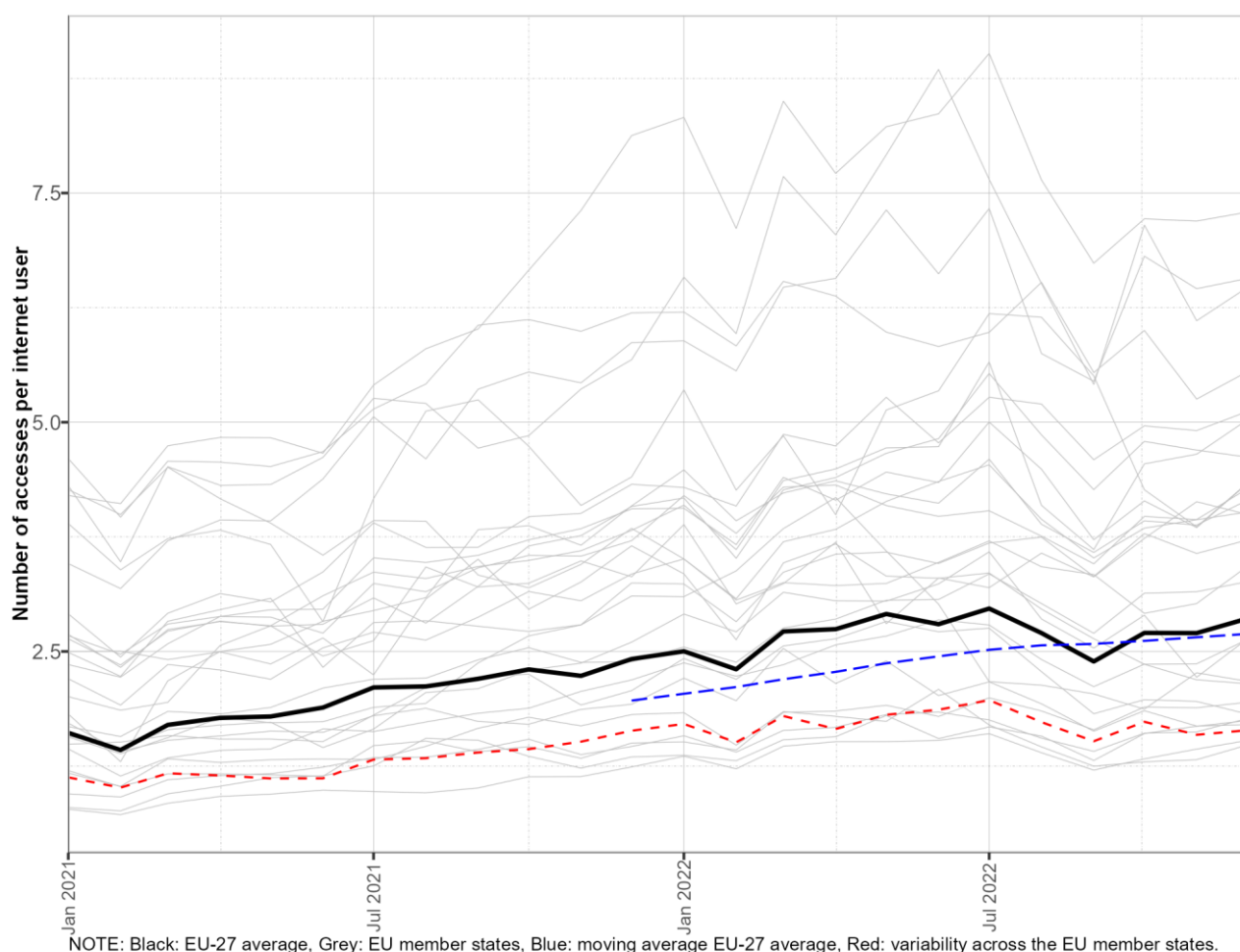


Figure 27. Music piracy with breakdown per device type and country, 2022

#### 4.5 Evolution of publications piracy

Data on accesses to sites providing pirated publications and software are available from 2021. In 2022, pirated accesses to publications were the second most significant source of piracy (after TV content), representing one quarter of total accesses and an average of 2.7 accesses per internet user per month. Since 2021, pirated accesses to publications have increased in most EU Member States, with very high variability among them (Figure 28). The main method of obtaining this kind of pirated content is through downloading, and the other methods have only marginal shares (Figure

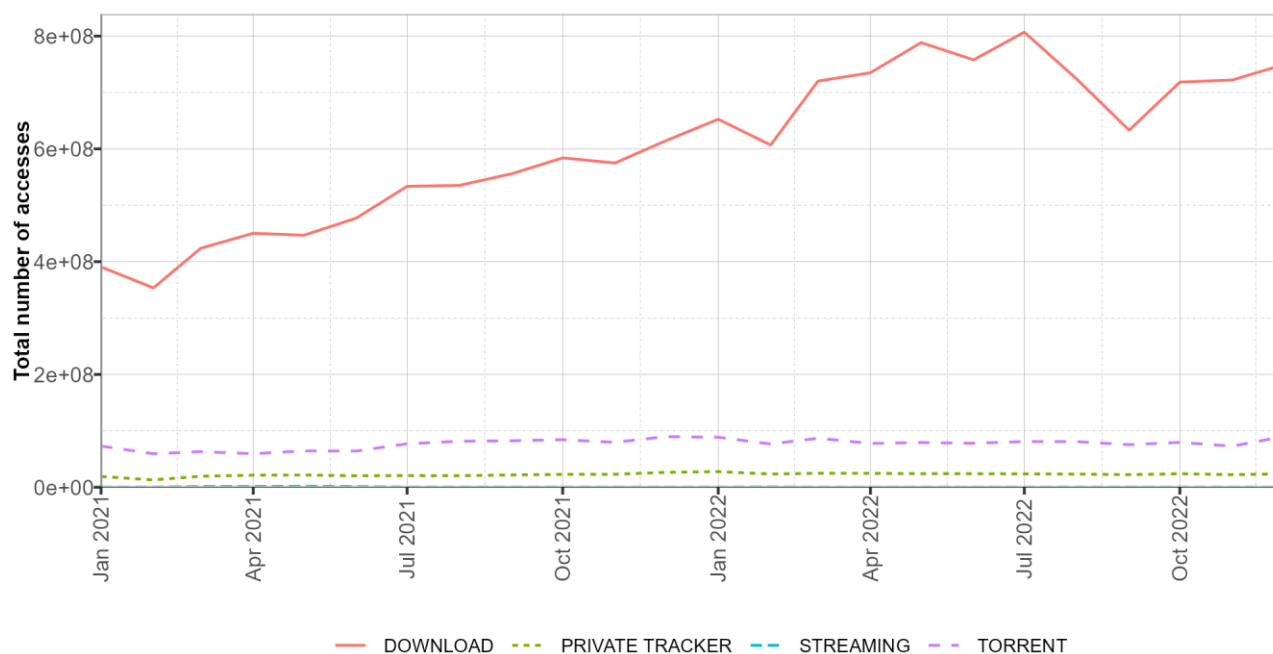
29). This method's profile shows an increasing trend that coincides with that of pirated content consumption on mobile devices, which is significantly higher than that on desktop devices.



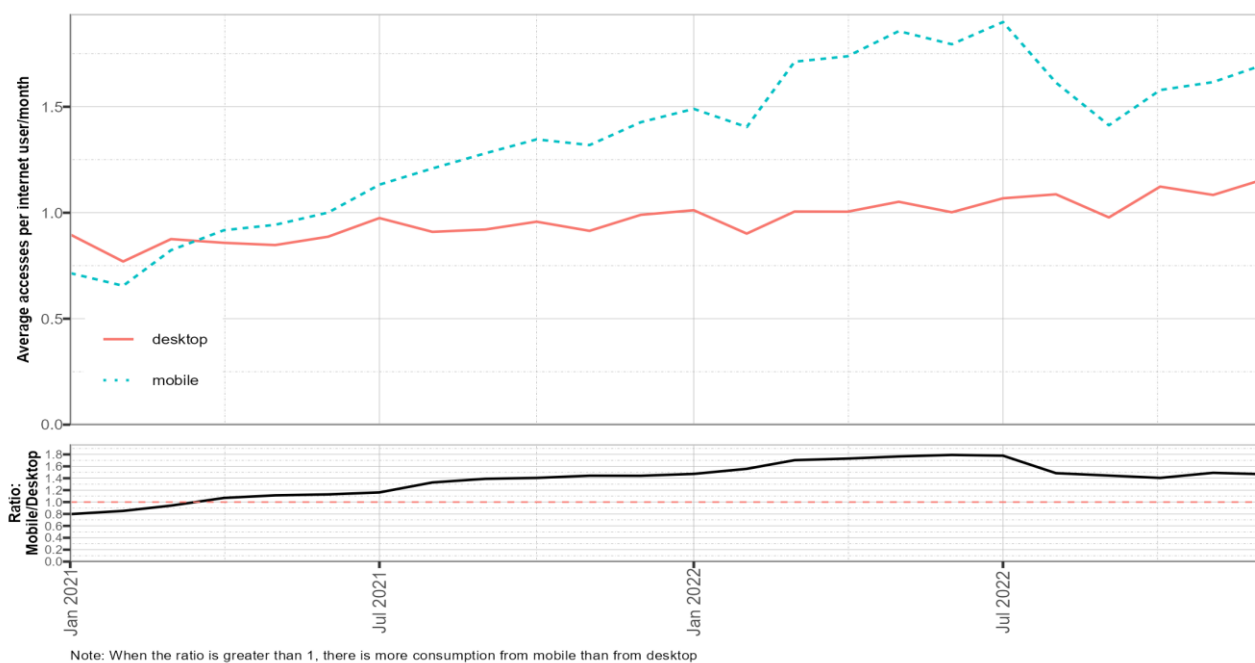
**Figure 28. Evolution of publications piracy (accesses per month) in the EU27.**

The main type of pirated publication was manga, which grew from about 45 % of the total at the beginning of 2021 to more than 60 % at the end of 2022. This category is followed, at some distance, by audio- and ebooks and web fiction<sup>(42)</sup>. As shown in Figure 28, there are significant differences among countries, with monthly accesses per user ranging from around 8 accesses per month in Lithuania to less than 2 in Romania.

<sup>(42)</sup> From MUSO: 'Written works of literature available primarily or solely online, often not published as a whole and released online in instalments (excluding manga)'.



**Figure 29: Evolution of publications piracy in the EU27, broken down by method.**



**Figure 30. Evolution of publications piracy with breakdown per device type**



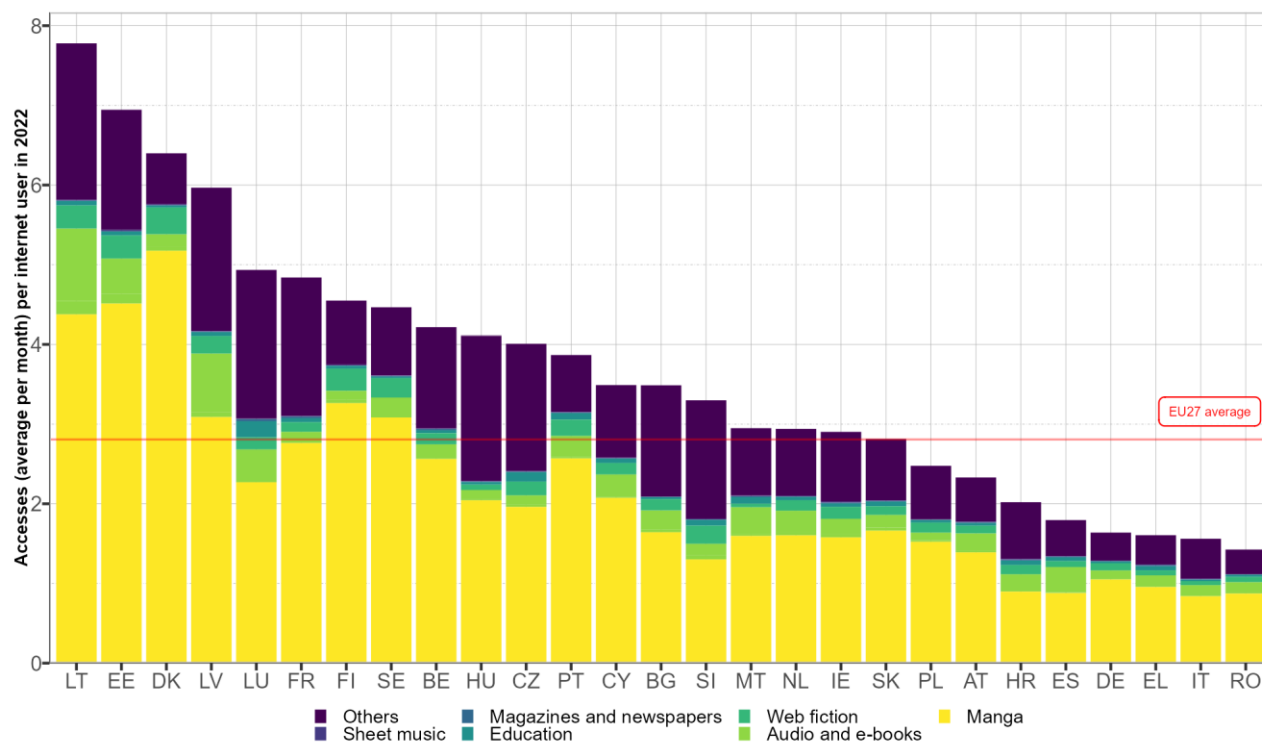


Figure 31. Distribution of publications piracy per country and genre, 2022.

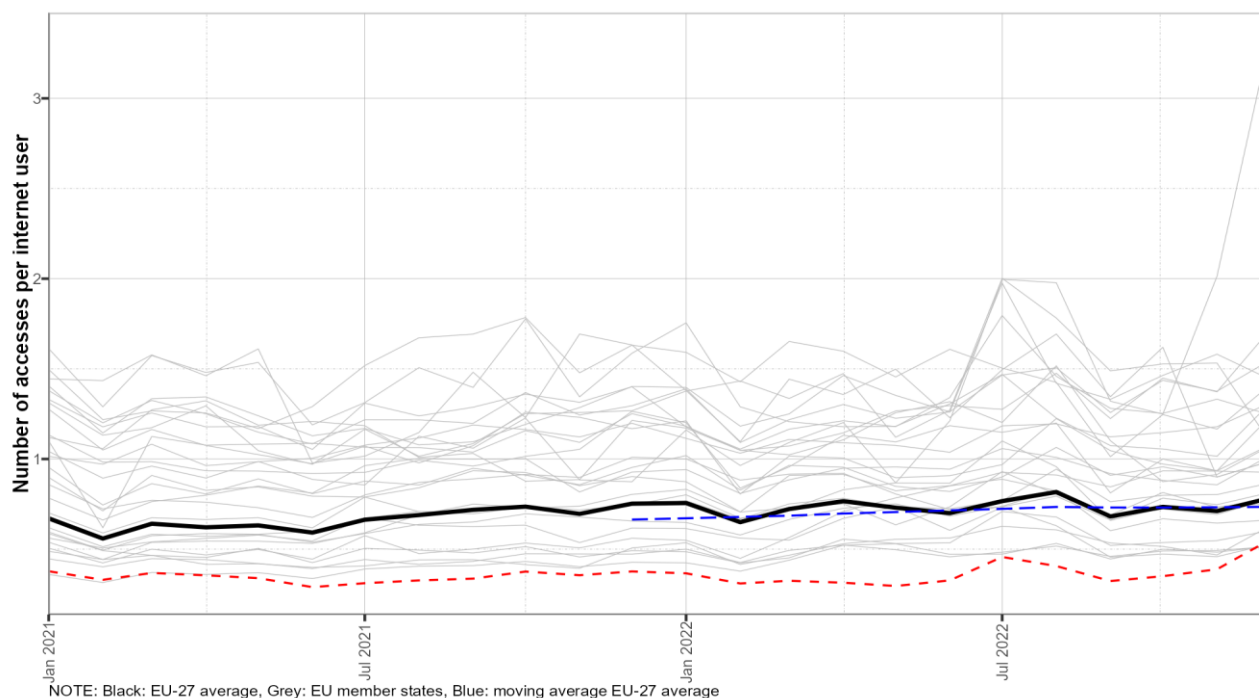
## 4.6 Evolution of software piracy

In 2022, software piracy was of a similar magnitude to music piracy, with an average of 0.7 accesses per internet user per month. The profiles per EU Member State show very high variability between them (Figure 32).

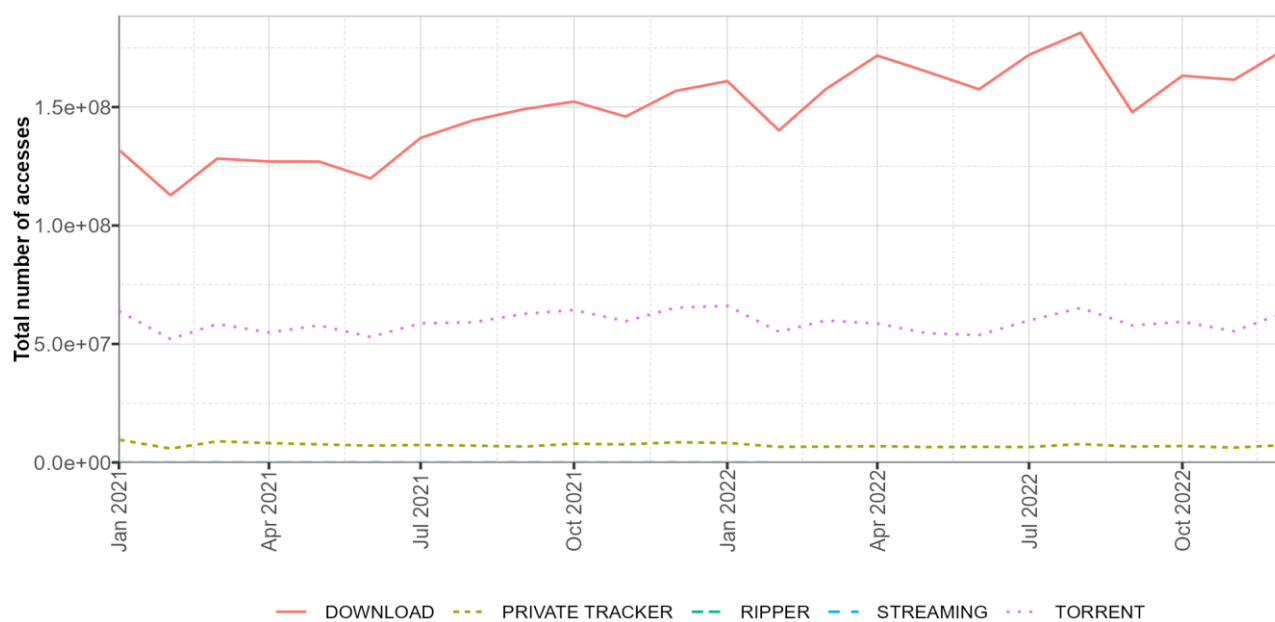
The main method of obtaining this kind of pirated content is downloading, with torrenting in second place. The dominance of downloading increased during 2022, as shown in Figure 33.

The share of mobile devices in software piracy has nearly doubled since the beginning of 2021, although it remains below that of desktop devices. If the current trend is maintained, mobile devices will soon be at the same level as desktops.

As shown in Figure 35, there are significant differences across countries, ranging from around 1.5 accesses per month per internet user in several countries to about 0.4 in Germany.



**Figure 32. Evolution of software piracy (accesses per month) per EU27 Member State, and EU27 12-month moving average**



**Figure 33. Evolution of software piracy with breakdown by method**

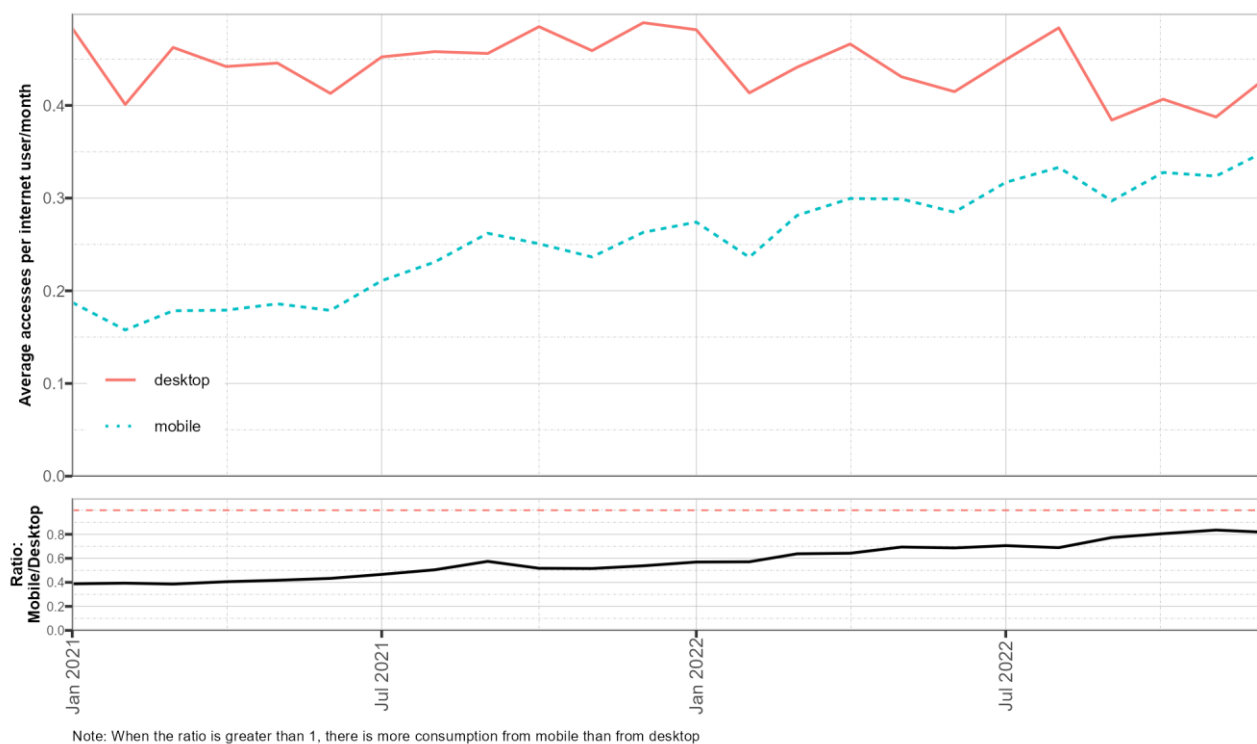


Figure 34. Evolution of software piracy with breakdown per device type

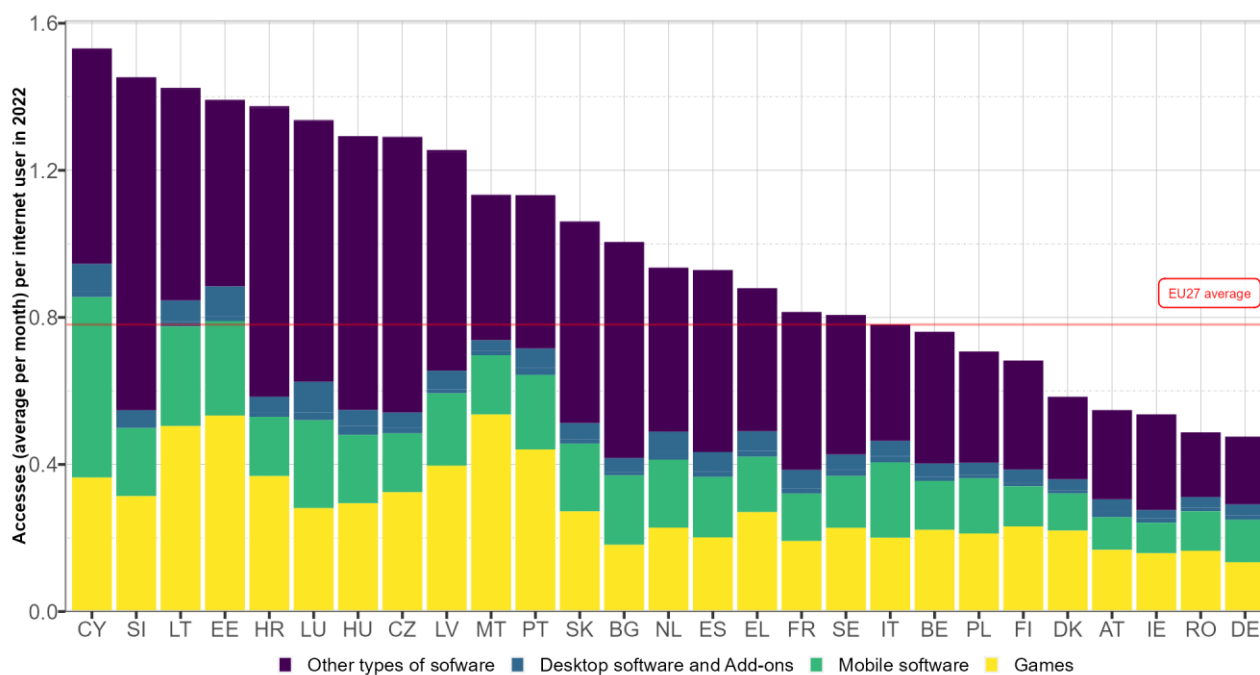
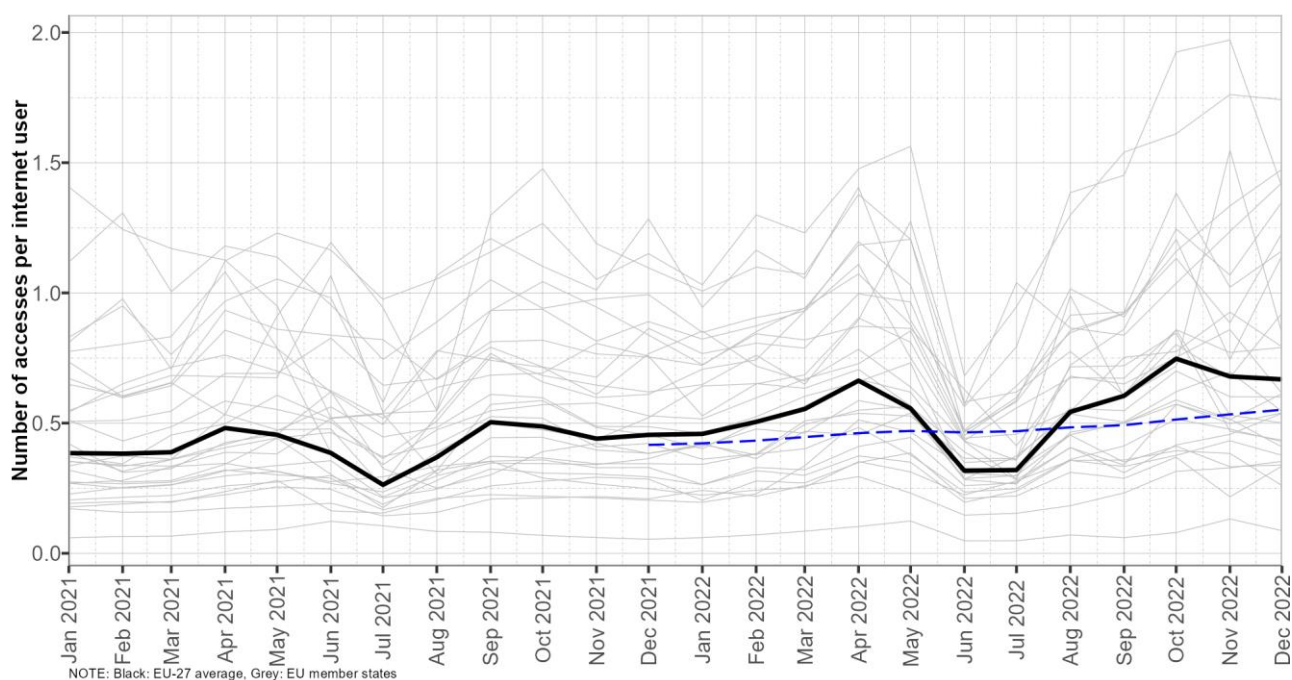


Figure 35. Average monthly software piracy per EU27 Member State, 2022

## 4.7 Sports live event piracy

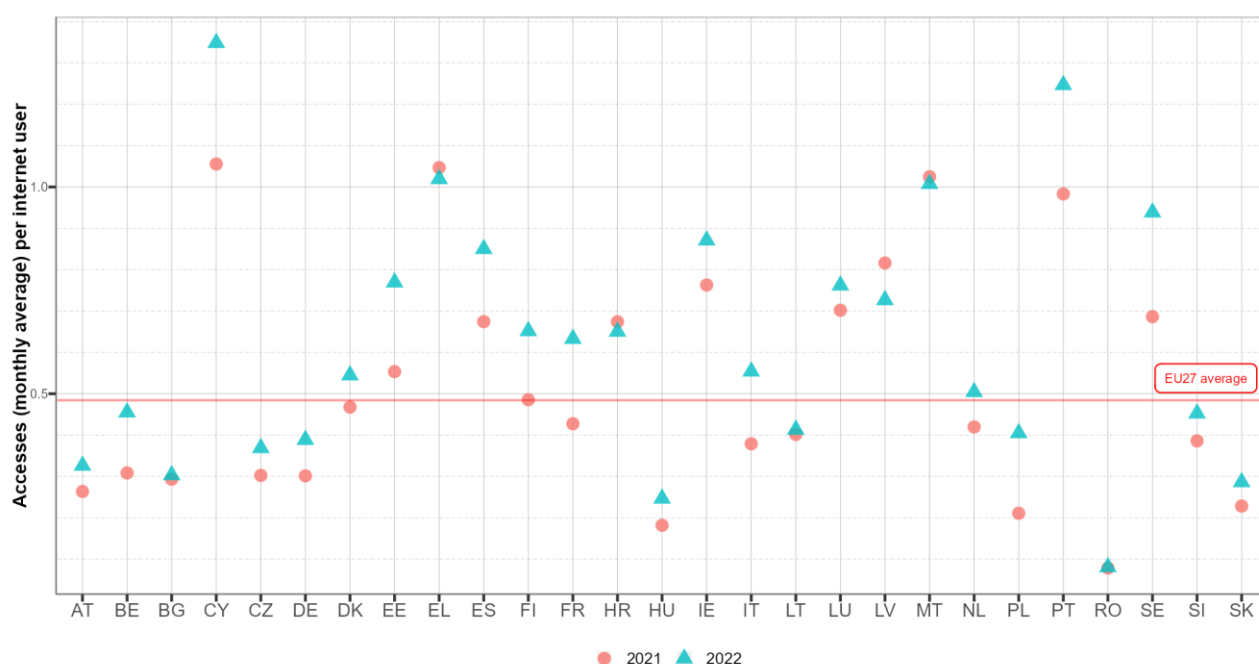
On 4 May 2023, the European Commission adopted a [Recommendation](#) on combating the commercial-scale online piracy of sports and other live events. It encourages Member States, national authorities, right holders and providers of intermediary services to take effective, appropriate, and proportionate measures to fight unauthorised retransmissions of such streams. In this context, a new section on sports live event piracy has been included in this report, for which data is available for 2021 and 2022.



**Figure 36. Evolution of sports live event piracy (accesses per month) in the EU27**

As shown in Figure 36, sports live event piracy has been steadily increasing, from a 2021 average of 0.42 accesses per user per month to 0.55 accesses in 2022, which represents a 30 % increase in only one year. Moreover, live event piracy shows some peaks and troughs, with relative maximums in April and September-October as well as minimum values in June-July of each year, possibly reflecting the fact that the main European football leagues have their summer break during those months.

The evolution per country (Figure 37) shows a high degree of variability, although one common element is that piracy increased in most of them. Some countries, such as Bulgaria, Greece, Croatia, Lithuania, Malta and Romania, did not experience any significant variation. The case of Latvia is particularly interesting, with a decrease of over 10 % in 2022 from the 2021 level. The EU27 average was 0.57 monthly accesses per internet user per month in 2022.



**Figure 37. Live sports event piracy per country in 2021 and 2022, and EU27 average<sup>(43)</sup>**

The source from which users consume unlicensed live sport events is, in nearly two thirds of cases, through direct access. Internet searches (19 %) and referrals (13 %) are the other main sources. Desktop devices are the preferred access method, although mobile access is also significant.

<sup>(43)</sup> The average is for 2021 and 2022.

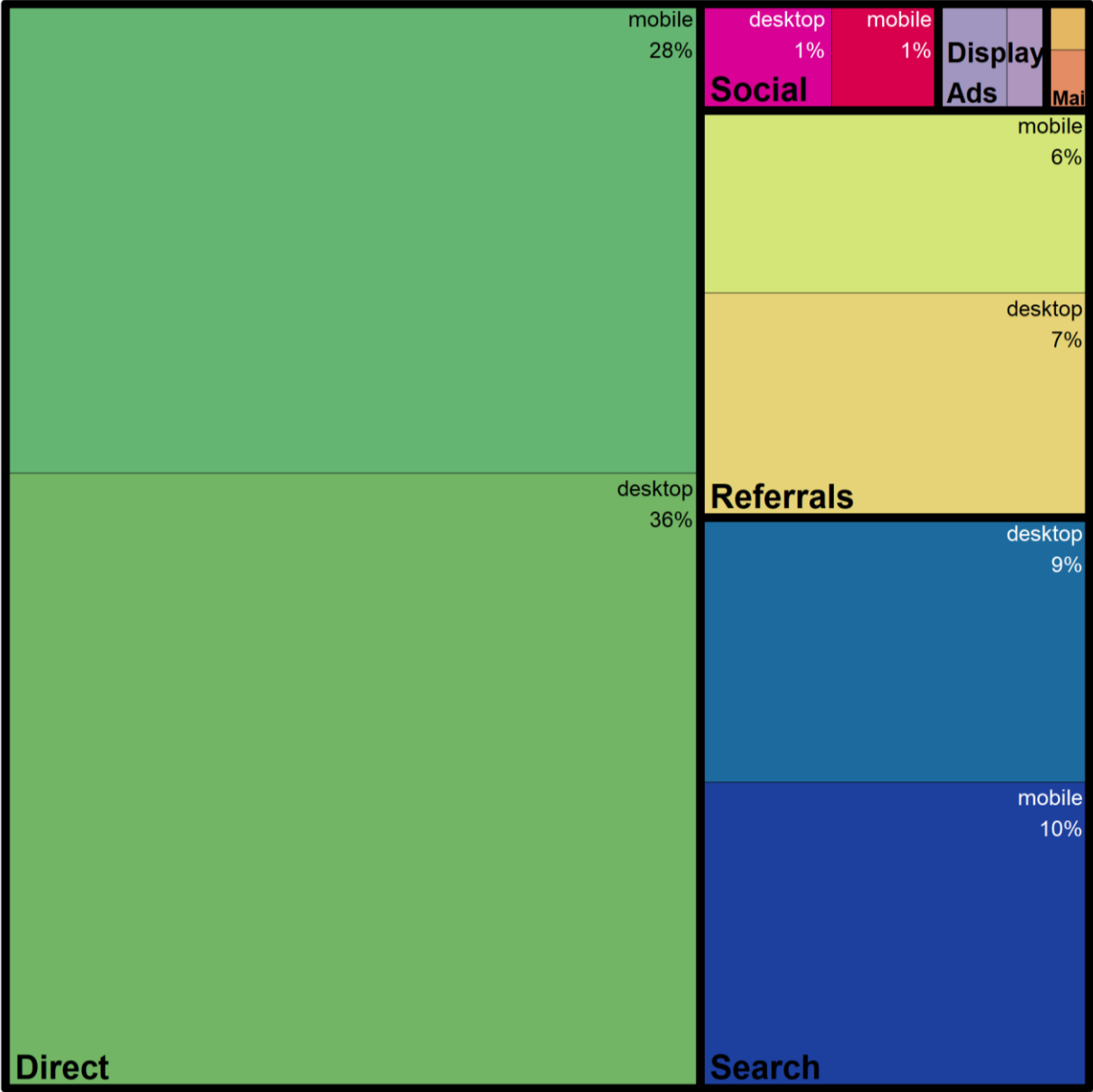


Figure 38. Distribution of pirated live sports event accesses by source and device type

## 5 Econometric Analysis

The previous section described the extent of piracy, its distribution per country and its evolution over time. In this section, econometric analysis is employed to better understand the socioeconomic factors that drive piracy. Based on a review of the literature, a set of variables is selected with the aim of testing specific hypotheses about socioeconomic drivers of piracy.

Because data for software and publications piracy is only available for 2021 and 2022, there are not enough observations available for an econometric analysis of these types of piracy. Therefore, the analysis in this section was only carried out for film, TV and music piracy.

### 5.1 Drivers of consumption of pirated content

This study examines national-level online piracy data from the 27 Member States to reveal the factors that drive the national differences shown in the preceding sections. This approach was first proposed for physical music piracy in 58 countries in Ki et al. (2006) and later by Walls (2008) for all kinds of film piracy in 26 countries. However, unlike Ki, who based his study on local surveys, individual research, and seizure statistics by affiliate national groups, or Walls, who used estimates from the International Intellectual Property Alliance (IIPA), the present study is based on a large dataset of accesses to sites providing copyright-infringing content for 2017-2022.

Once a set of potential explanatory variables is identified, a linear regression model is constructed that establishes a relationship between these variables and the average piracy per month and per internet user by Member State. This allows a determination of the independent variables that have a significant impact on piracy and the extent of that impact.

Before the econometric modelling itself, the set of independent variables that will be analysed to establish a link with piracy is presented below, as well as the hypotheses to be tested.

### 5.1.1 Income

Individual consumption of pirated content is often thought to be related to household income, since wealthier households can better afford to pay for legitimate content. This is an extension of the hypothesis formulated by Husted (2000), who studied the effect of national income distribution on software piracy. Moreover, Ki et al. (2006<sup>(44)</sup>) argue that a country's income influences piracy in two ways: (1) richer countries tend to have stronger intellectual property protection systems; and (2) consumers in those countries have more available income for the consumption of all goods, including legitimate digital content.

Therefore, the first hypothesis is:

#### **H1: the higher per capita income, the lower the consumption of pirated content per capita<sup>(45)</sup>**

The variable used was **GDP per capita**. This variable, along with gross national income (GNI) per capita, is the variable most often used in previous studies on piracy. The rationale for choosing GDP per capita was that, unlike GNI per capita, it was available for the entire period of the analysis.

### 5.1.2 Income inequality

Income inequality can affect the consumption of pirated content because music, films and television programmes, which are consumed by higher-income individuals, are also of interest to lower-income individuals, since knowledge of this content is a factor in social interaction<sup>(46)</sup>. At the same time, low-income individuals, having a reduced ability to pay for legitimate content, may be more likely to use illicit content instead. Ki et al. (2006) examined the impact of income inequality on music piracy rates at the national level and discovered that piracy was positively related to income inequality.

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<sup>(44)</sup> This study focused on music piracy.

<sup>(45)</sup> Husted, 2000: 'Hypothesis 1: The higher the level of economic development, the lower the rate of software piracy.'

<sup>(46)</sup> Consumers downloading music illegally are motivated by three basic utilities: economic (saving money), collection (musical enjoyment) and social (increasing interaction and connectivity with others) (Sheehan et al., 2012).



Therefore, the second hypothesis was formulated as follows:

**H2: the higher the income inequality, the higher the consumption of pirated content per capita**

Two indicators can be used to measure income inequality:

- The **Gini coefficient** measures the extent to which the distribution of income within a country deviates from a perfectly equal distribution. A Gini value equal to 0 would mean perfect equality, with everyone having the same income, while a Gini coefficient of 1 corresponds to complete inequality, with all income accruing to only one individual. The values of the Gini coefficient were obtained from the indicator 'ilc\_di12' in Eurostat for 2017-2022.
- The **youth unemployment rate** is the percentage of unemployed individuals in the 15-24 age group compared to the total labour force in that age group (excluding those in education). The values were obtained from the 'une\_rt\_a' table in Eurostat for 2017-2022. A high youth unemployment rate can be considered another manifestation of economic inequality and therefore may affect piracy rates.

### 5.1.3 Population structure

According to the most recent EUIPO IP Perception study<sup>(47)</sup> (2023), 33 % of respondents aged 15-24 admitted to accessing pirated content, a far higher proportion than older age groups and more the double the overall EU average of 14 %. This indicates that younger consumers are more prone to access pirated content intentionally.

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<sup>(47)</sup> European Citizens and Intellectual Property: Perception, Awareness and behaviour – 2023.

The third hypothesis is formulated accordingly:

**H3: the higher the proportion of young people in a country, the higher the consumption of pirated content per capita**

The variable **proportion of population aged 15-24** for 2017-2022 was sourced from the Eurostat table 'demo\_pjangroup'.

#### 5.1.4 Attitude and behaviour

Cesareo & Pastore (2014) found that the 'moral intensity' of the individual negatively influences their intention to participate in digital piracy. In other words, independently of the level of income or other socioeconomic variables, in some countries, consumers have a more permissive attitude towards IP infringement than in others. This is consistent with the conclusions of the IP Perception study, which also shows significant differences in attitudes towards piracy among Member States.

Consequently, the fourth hypothesis is:

**H4: the more permissive the attitude towards piracy in a country, the higher the consumption of pirated content per capita**

The following question in the IP Perception studies was used as a measure of the attitude to piracy in each country:

- Q3.6<sup>(48)</sup>: 'To what extent do you agree or disagree with the following statements? - It is acceptable to obtain digital content illegally from the internet or from apps when it is for my

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<sup>(48)</sup> The previous issue of this report took question 3.5: 'It is acceptable to obtain content illegally from the internet when there is no immediately available legal alternative'. However, this question was not included in the last IP Perception study, and therefore question 3.6, which was available in the 2017, 2020 and 2023, has replaced the former.

personal use'. The values represent the percentage of respondents that totally or partly agreed with this statement in each country for each year.

IP perception studies were carried out in 2017, 2020 and 2023. The data for 2018, 2019 and 2021 were imputed from the closest year, namely 2017 and 2020, respectively.

#### 5.1.5 Digital development and awareness of legal offers

Walls (2008) argues that countries with higher levels of IT infrastructure have lower levels of film piracy. His study found that piracy decreased with the level of overall internet use. This leads to the fifth hypothesis:

**H5: the higher the level of digital development, the lower the consumption of pirated content per capita**

Arguably, the quality of internet infrastructure could also increase the consumption of pirated content. After all, the same bandwidth that is used to stream a film from a legal source can also be used to stream content from an illicit source. Therefore, this hypothesis was not a priori considered particularly strong.

The following variables were considered as proxies for the degree of digital development:

- question **q4b.2** in the IP Perception study: 'Paid to access, download or stream copyright-protected content from a lawful source' (proportion of respondents answering affirmatively);
- question **q6.1-4** in the IP Perception study, indicating awareness of legal offers for the various types of content.

Like other data from IP perception studies, both variables were available only for 2017, 2020 and 2023<sup>(49)</sup>. Data for the 2018, 2019 and 2021 were imputed.

#### 5.1.6 Market size

Studies of software piracy (Gopal & Sanders, 1998) and music piracy (Ki et al., 2006) have found a negative relationship between the size of a market and the level of piracy. The exact nature of the mechanism at work is not clear. Ki et al. (2006) stated that, in countries with a large music market, people tend to recognise music as a social value, leading to greater respect for copyright to protect against music piracy. The study found that the size of the music market was significantly and negatively associated with music piracy rates, taking other factors into account. Therefore, the sixth hypothesis in the present study is:

**H6: the bigger the market, the lower the consumption of pirated content per capita**

The **number of internet users in the country**, derived from Eurostat table ‘tin00091’, was used as a proxy for the relevant market size.

#### 5.1.7 Legal offer

It has been widely argued that the availability of legal offers has the effect of reducing piracy, and as seen in the responses to the IP Perception study, in 2023, 26 % of respondents across the EU

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<sup>(49)</sup> As mentioned above, the variables q3.5, q4b.2 and q6.\* stem from the IP Perception studies. The 2023 survey was executed using computer-assisted web interviewing (CAWI), while the 2017 and 2020 surveys were carried out by phone by human interviewers. Therefore, the results of the last survey may not be completely comparable to the previous ones. Despite this, and following a comparative analysis of the relevant questions with previous years, these results were included in this study because no significant variations were detected compared to those in previous years.

declared it acceptable to obtain online pirated content when there is no immediately available legal alternative. Therefore, the seventh hypothesis was:

**H7: the more extensive the legal offer, the lower the consumption of pirated content per capita**

Three variables were used as proxies for legal offer availability:

- the **number of online video platforms**,
- the **number of TV channels**,
- the **number of music platforms** available in each Member State.

The first two variables were obtained from the MAVISE database of the European Audiovisual Observatory, counting the platforms or channels targeting the market of each country, regardless of the origin of the platform or channel. The data on the number of music platforms was sourced from Pro-music.

As the data for 2018, 2019 and 2021 were not available, it was assumed that they were the same as those of 2017, 2020 and 2022 respectively.

### 5.1.8 Summary of hypotheses and variables

	Group	Variable	Description	Literature
H1	Income	I_GDP	Log10 of gross domestic product per capita	Yang et al., 2009
H2	Income inequality	Gini	Gini coefficient	Banerjee et al., 2005
		you_unemp	Youth unemployment	Ki et al., 2006 Gomes et al., 2018
H3	Population structure	p_young	Proportion of population aged 15-24	
H4	Attitude and behaviour	q3.6	It is acceptable to obtain content illegally from the internet when there is no immediately available legal alternative	Cesareo & Pastore, 2014
H5	Digital development	q4b.2	Paid to access, download or stream copyright-protected content from a lawful source	
		q6*	User awareness of legal offers (four different variables)	
H6	Market size	Share_iusers	Share of internet users in the adult population	Ki et al., 2006 Gopal et al., 1998
H7	Legal offer	TVch	Number of TV channels	
		I_plat_vi	Number of online platforms for video and TV	Briggs, 2013
		n_plat_mu	Number of online platforms for music	

## 5.2 Econometric modelling

The econometric modelling was performed with a dataset of 162 observations that corresponds to the annual piracy levels in each of the 27 EU Member States for the 6 years between 2017 and 2022. Several combinations of the independent variables were tested to better understand the piracy of films, music and TV content. In all cases, the dependent variable is the number of accesses to sites providing pirated content per internet user per year.

The dataset included some outliers for the TV, film and music piracy variables that were removed prior to modelling. For this, the interquartile range criterion was used, so that the observations above the value indicated below were removed:

$$Lim_{sup} = q_{0.75} + 1.5 \times IQR$$

where  $q_{0.75}$  is the third quartile and IQR corresponds to the interquartile range. No minimum was considered, as the same criterion would yield a negative value for piracy. When dealing with a random effects model (see below), all the observations of the countries with piracy values above the threshold indicated above were removed to avoid different number of observations per country, which would give rise to unbalanced panels.

The presence of heteroskedasticity was checked for each model with the Breusch-Pagan test. The models for which the null hypothesis (homoskedasticity) had to be rejected were not shortlisted.

The dataset used in this study has a panel structure, where the values of the dependent and control variables are observed for the same countries for 6 years. To analyse panel data, three types of models are often employed: pooled models, fixed effects models or random effects models.

- Pooled models have constant coefficients for the intercept and slopes. They are calculated with an ordinary least-squares regression model.
- Fixed effects models allow implicit control of time-invariant, country-specific features that may otherwise bias the analysis of the relationship of the key variables of interest relative to piracy.
- Random effects models allow individual intercepts for each country. However, they make an additional assumption, namely that those intercepts are not correlated with explanatory variables in the model.

The descriptive analysis in the previous section showed that 2020 and 2021 behaved differently from the previous years and 2022. It is likely that this is due to the impact of the COVID-19 crisis. Although the economic impact is certainly reflected, at least partly, in some of the indicators used in the

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analysis, such as the GDP, it is not clear that the entire economic impact and social effects are included in the variables chosen for this study. For this reason, it was assumed that fixed time effect models could make sense in this case; therefore, some models including fixed effects were tested.

For the model selection, the main criteria were:

- a variance inflation factor (VIF) below 3 to ensure low multicollinearity;
- maximising the adjusted  $R^2$ , an indicator of the explanatory power of the model.

The table below summarises the results of the econometric models for the three content types analysed. The results are further discussed in the subsections that follow. Annex C contains further information on the heterogeneity of the piracy rates by content type by country and over time.



		Dependent variable		
		EU27 Activity		
		Music	Film	TV
H1	Income l_GDP		-11.51***	
H2	Income inequality Gini	0.45**		-0.76
H3	Proportion of youth p_young you_unemp	0.9***	2.47*** 0.5***	0.48
H4	Inclination to piracy q3.6	0.29***		-0.21
	Paid to legal services q4b.2	-0.24***	-0.33**	-0.140***
H5	Awareness of legal offer Music - q6.1 Film - q6.2			
H6	Share of internet users Share_iusers			-0.82**
H7	Number of legal platforms Video - n_plat_vi TV - Tvchannels_scaled Music - n_plat_mu		-0.01*** -0.54**	-0.06*** -2.02***
	COVID-19 Dummy Variable		-4.15**	-12.93***
	Dummy Year 2018	-4.76***		
	Dummy Year 2019	-5.35***		
	Dummy Year 2020	-10.13***		
	Dummy Year 2021	-11.30***		
	Dummy Year 2022	-11.85***		
	Intercep	-5.3	58.5***	230.8***
	Observations:	145	155	138
	R <sup>2</sup> adjusted	0.587	0.490	0.57
	Variance Inf. Fact.	2.5	2.0	2.3
Note:		*p<0.1; **p<0.05; ***p<0.01		

Table 9. Econometric models for music, film and TV piracy

### 5.2.1 Results for TV piracy

Following the results of the Hausman test<sup>(50)</sup>, the random effects model was the most appropriate for TV content piracy.

The model showed that the economic<sup>(51)</sup> variables such as the Gini index and the GDP per capita were not significant determinants of TV piracy. The share of internet users was significant, and the coefficient indicates that the higher this share, the lower the level of TV piracy, holding other variables constant.

The dummy variable associated with the COVID-19 crisis had very high significance, with a non-negligible piracy reduction of about 15-17 % compared to the EU average for the whole period.

Concerning the offer of TV channels and VOD platforms, the model supported the hypothesis that a broader legal offer, as indicated by the number of VOD platforms and TV channels, reduces piracy.

### 5.2.2 Results for film piracy

As in the 2021 study, a pooled model turned out to be appropriate for film piracy. No significant fixed effects were encountered, and the Hausman test suggested that the random effects model was not the most appropriate. Although the tested fixed effects models yielded high  $R^2$  values, they were rejected because the associated coefficients were not significant in most cases. The high  $R^2$  was probably due to the high number of independent variables rather than the information contained in the models themselves. Therefore, it was not possible to analyse film piracy data as a panel dataset.

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<sup>(50)</sup> The Hausman test is a statistical test used to choose between fixed and random effects models. For a description, see Verbeek (2012), Chapter 10.

<sup>(51)</sup> The outcome of the analysis in the previous issue of this report in 2021 was that GDP was highly significant, as was, to a lesser extent, the youth unemployment rate. There may be several reasons for this, such as: i) the addition of a variable for the COVID-19 crisis; ii) the availability of two more observations per country; and iii) the use of a random effects model instead of a pooled model.

In the model chosen according to the statistical criteria, the share of young people in the population and the youth unemployment rate appeared together with a high degree of significance.

The significance of the replies to question Q4b.2 (users who have paid for legal content) indicates that this type of user tends to abandon piracy when they subscribe to legal services.

As was the case with TV piracy, a broader legal offer also reduces film piracy, as evidenced by the significant coefficients for the number of VOD platforms and the number of TV channels, with the latter variable having a greater effect.

The models also confirmed the hypothesis that richer countries tend to have lower levels of film piracy, as the GDP per capita variables were significant. In this case, the Gini index was not significant. One possible reason for this is that inequality is already (partly) incorporated in the model through the youth unemployment rate.

While no time effects for 2017 to 2022 were included in the model, a dummy variable for 2020 was added to take the COVID-19 crisis into account. The outcome is that this dummy variable was significant, with a negative sign, indicating a reduction in film piracy, as was also shown in the descriptive analysis in Section 4.

### 5.2.3 Results for music piracy

In the case of music piracy, the selected model included time-fixed effects.

GDP per capita and the youth unemployment rate were not significant predictors of music piracy. However, the Gini index was significant. As expected, a reduction in inequality (i.e. a lower Gini index) tends to decrease music piracy. The share of young people was also significant. As the sign is positive, piracy increases as the share of young people grows.

The perception study variable q3.6 was significant with a positive coefficient, which confirms that attitudes towards piracy have an influence on actual piracy levels. The variable q4b.2 (purchase of

legal content) was also significant, indicating that users who pay for legal content are less inclined to opt for pirated content.

An ample legal offer, here indicated by the number of music platforms, helps reduce music piracy, as was also the case for film and TV piracy.

The dummy variables for 2018 to 2022 are significant. The estimators reflect the downward trend in music piracy.

### 5.3 Summary of the econometric analysis

This section has presented the results of the three best models for consumption of pirated music, films and TV, respectively. The detailed results of each of the three models, including significance levels of the estimated coefficients and the goodness of fit statistics, are shown in Table 10 above. Several additional models were evaluated. The results of these models are broadly consistent with those in Table 10, but the selected models were judged to be the best based on statistical criteria and interpretability of the results.

The main conclusions of the analysis are the following.

- **Piracy behaves differently in each of the three domains studied.** The explanatory variables are different, and even when there is a coincidence, the magnitude of the associated coefficient varies.
- **Economic and social factors are important in reducing piracy.** The models show that countries' wealth, inequality, population structure and youth employment opportunities influence piracy.
- **The volume of the legal offer contributes to reducing piracy in all three domains.** In addition, for TV and film piracy, the variation of the offer in either also affects the other.

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- **The models confirm that the COVID-19 pandemic contributed to reducing film and TV piracy, although not music piracy.**
  - **There is some substitution between pirated and legal content.** The models show that citizens who purchase legal content will reduce or eliminate their consumption of pirated content in all domains.

## 6 Conclusions

This report examines the consumption of copyright-infringing content in the 27 EU Member States and the UK for TV programmes, music, films, software and publications. The dataset is broken down into several categories that have been explored to better comprehend the phenomenon of piracy.

From the descriptive analysis of this study, one can conclude the following.

1. The availability of VOD platforms, TV channels and music platforms has significantly grown during 2020-2023.
2. The decreasing trend of piracy reversed at the end of 2020. It is now being fuelled upwards mainly by publications and TV programmes, and, to a lesser extent, films. Music, software and music piracy is flat or slightly increasing.
3. The variability between countries is very high, although it is decreasing.
4. The COVID-19 pandemic had a very high impact on film piracy in all the EU Member States, with significant reductions in most of them. Although piracy grew again in 2021 and stabilised in 2022, pre-COVID-19 levels have not been reached.
5. Streaming is the preferred method for several types of content, while downloading was significant for publications and ripping for music.
6. Live event piracy is increasing. Although there is a high variability across countries, the overall seasonal patterns are similar.

The econometric analysis provided further quantitative insights. The analysis was performed on the total annual piracy per capita in each EU Member State for which socioeconomic, market and consumer-related variables were analysed. The main conclusions that can be highlighted are the following.

1. The selected econometric models can explain up to nearly 60 % of the variance for music and TV, while it was about 50 % for TV channel piracy.
2. The legal offer in each country is very relevant in determining the level of piracy in all domains. For film and TV piracy, the models showed that the market offer in the two sectors is relevant in both. For instance, TV channel piracy is influenced by both the number of legal TV channels and the number of online video platforms.
3. The social and economic variables were particularly relevant in explaining music and film piracy.
4. Consistent with the findings of the IP Perception study, a higher proportion of young people tends to lead to an increase in piracy.
5. For all types of content, higher consumption of legal offers reduces piracy.

The combination of the descriptive and econometric analyses in this report hopefully provides a comprehensive understanding of the phenomenon of digital piracy in the EU Member States. The findings can be utilised to inform the strategies and policies used to combat piracy effectively and support the growth of the digital content industry.

This report has not addressed how market prices and copyright law enforcement in the EU Member States influence piracy for each type of content. Future research activities could include these two points to improve the understanding of piracy. Furthermore, while the range of content being analysed has expanded compared to the earlier studies with the inclusion of publications and software, as well as a more granular specification of genres within each content type, the access methods included in the data omit an important form of piracy, namely dedicated IPTV devices. This data limitation will hopefully be addressed in a future study.

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## Glossary

AVOD	ad-based video on demand
BVOD	broadcaster video on demand
CJEU	Court of Justice of the European Union
DVD	digital versatile disc
FOD	free on-demand service
GDP	gross domestic product
GNI	gross national income
HDI	household disposable income
IFPI	International Federation of the Phonographic Industry
LD	laserdisc
PPS	purchasing power standard
SBMS	subscription-based music services
SVOD	subscription video on demand
TVOD	transactional video on demand
UGC	user-generated content
VCD	video compact disc
VOD	video on demand
VSP	video sharing platforms

## Annexes

### Annex A TAXONOMY

#### A.1 Delivery methods<sup>(52)</sup>

- **Public Torrent** – Piracy sites in this category are publicly accessible torrent indexing sites, which are online catalogues of torrent files available for download from the peer to peer (P2P) torrent network. A public torrent indexing site provides the user with a mechanism to search for torrent files and torrent magnet links which facilitates peer-to-peer (P2P) file sharing among users of the BitTorrent protocol. Public torrent is a measurement of visits to the websites offering publicly searchable catalogues of torrents.
- **Private Torrent** – Piracy sites in this category are very similar to those in the Public Torrent category, except only members of the site can login and access the site's content. Most private torrent sites operate an invite only policy on membership. Private torrent is a measurement of visits to websites offering privately accessible catalogues of torrents.
- **Web Download** - Piracy sites that primarily allow consumption of infringing material via a direct file download from the user's web browser. These sites typically offer a wide range of downloadable content directly searchable from within the site. The site acts as the point of discovery for a user searching for content. The web download site often acts as a referrer to a separate file download hosted on third party anonymous cyberlockers.
- **Web Streaming** - Piracy sites that primarily allow consumption of infringing material streamed directly to a media player embedded in the web page of the web browser. These sites typically offer a wide range of content that is searchable from within the site. Sites

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<sup>(52)</sup> From MUSO's technical specifications.

offering both a download and streaming option are included in this category where streaming is the primary focus.

- **Stream Ripper** - Stream Ripper websites are sites which allow a user to supply a link to content hosted on a separate legitimate online streaming service, such as YouTube. The Stream Ripper site is capable of converting the online video/audio stream into an offline download i.e. to 'rip' the content. Stream Ripper sites infringe the terms and conditions of the original site by extracting content into a downloadable unlicensed format.

## A.2 Sources

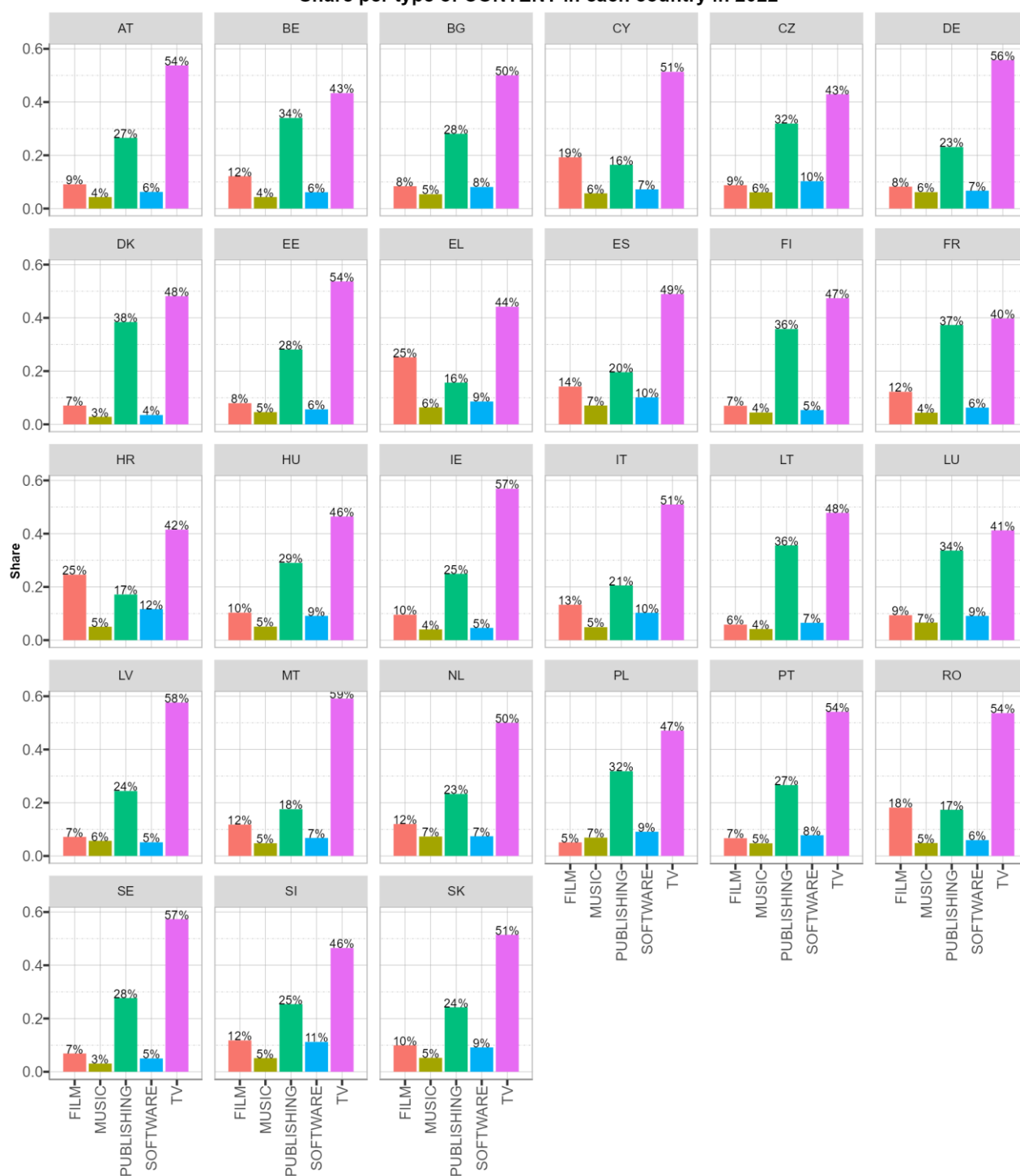
- **Direct:** Traffic sent from users via a direct URL address entered into a browser, saved bookmark or a link from outside the browser (i.e. Microsoft Word), Popup ads, Autofill.
- **Search:** Traffic sent via the results on search engines such as Google or Bing and search partners. This section includes both organic and paid search traffic.
- **Referral:** Traffic sent via links from other domains such as affiliates, partners, news coverage, review sites and direct media buying (not through advertising networks).
- **Social:** Traffic sent from social media sites such as Facebook or Reddit.
- **Mail:** Traffic sent from web-based mail clients.
- **Display Ads** <sup>(53)</sup>: Traffic sent from other domains via a known ad-serving platform of banner or content suggestion ads (i.e. Doubleclick, Taboola).

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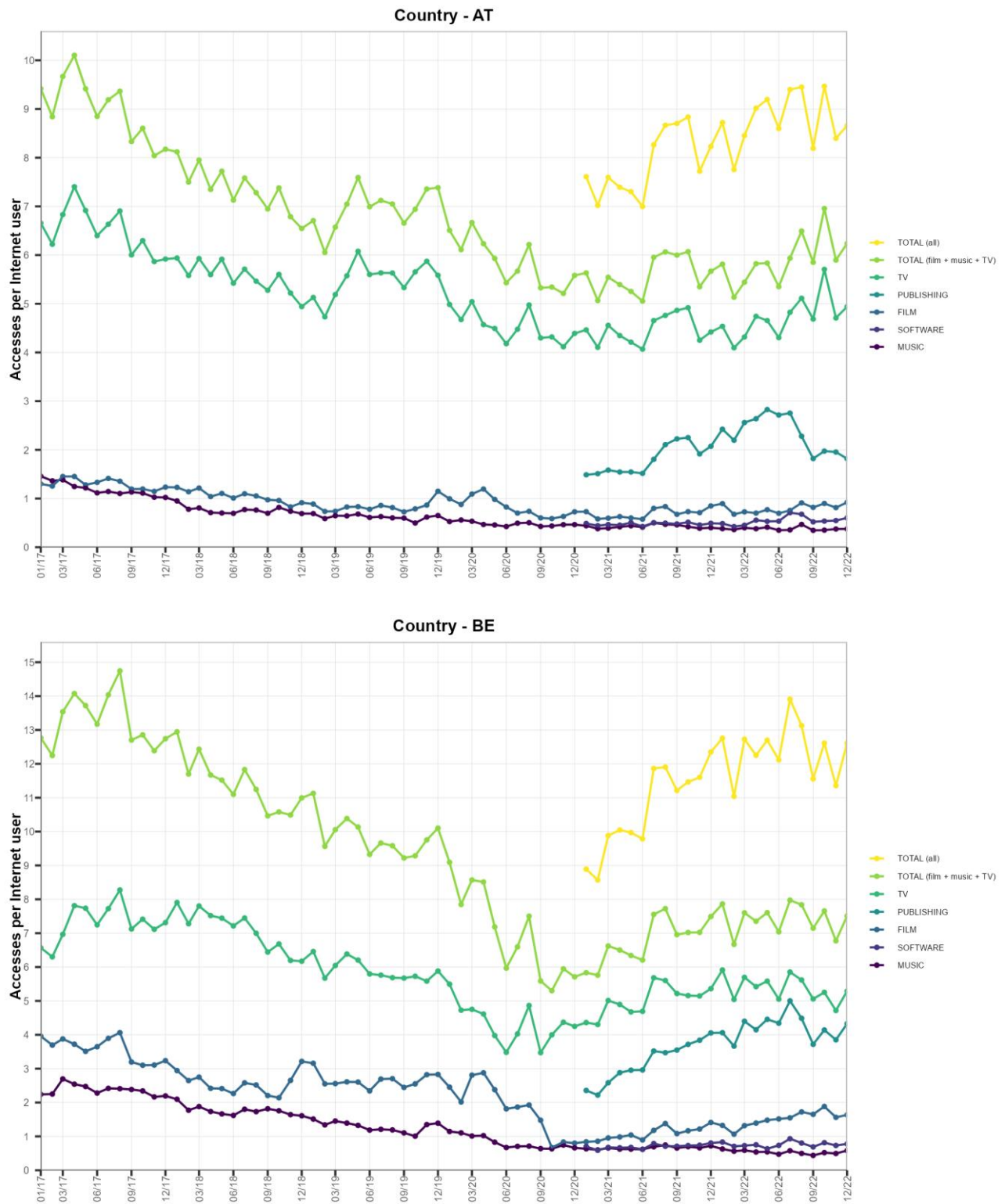
<sup>(53)</sup> The accesses originated by "Mail" and "Display Ads" have been aggregated in this study since the figures are very small.

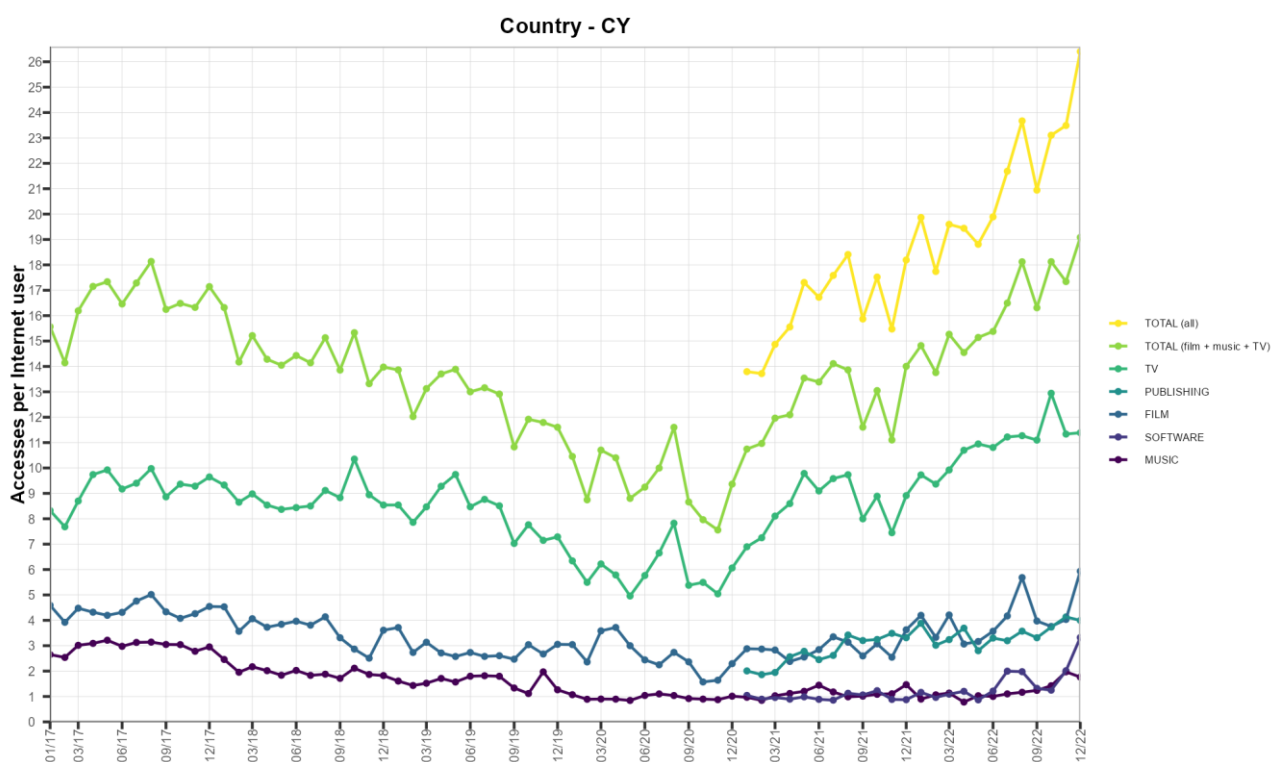
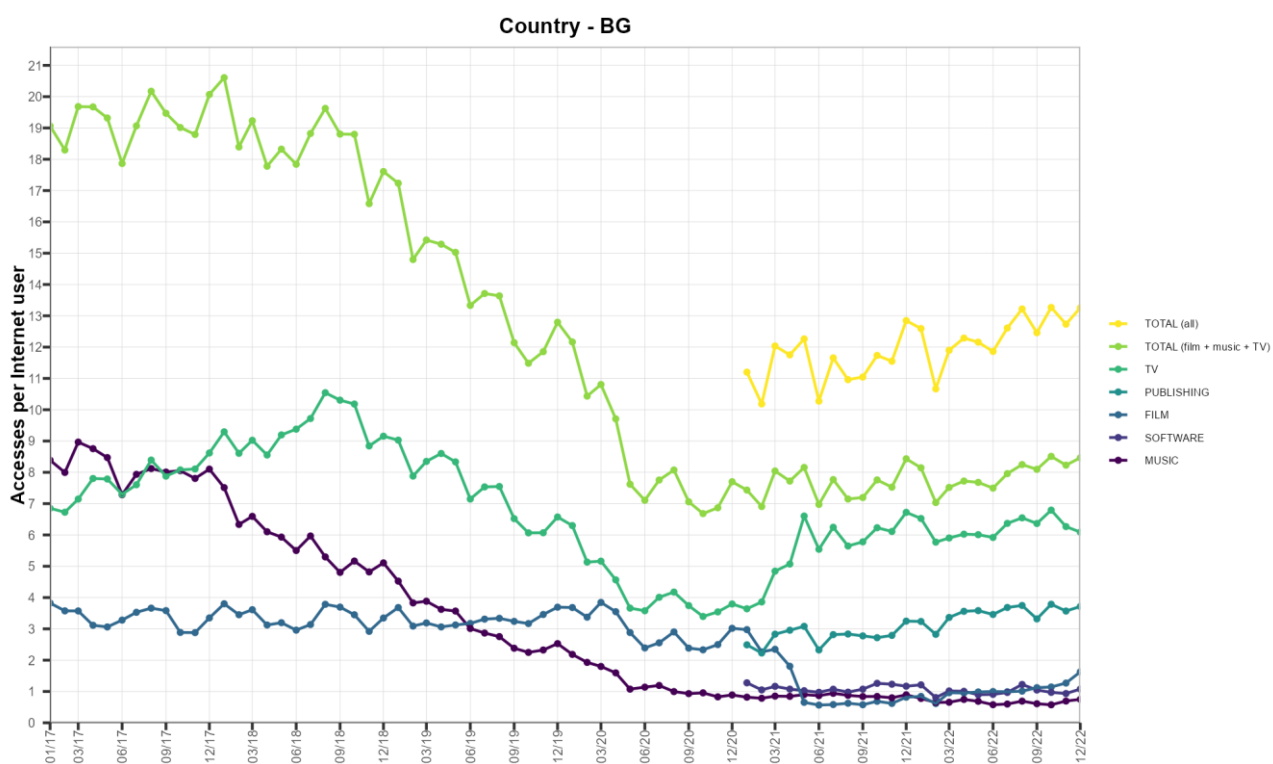
## Annex B Country profiles

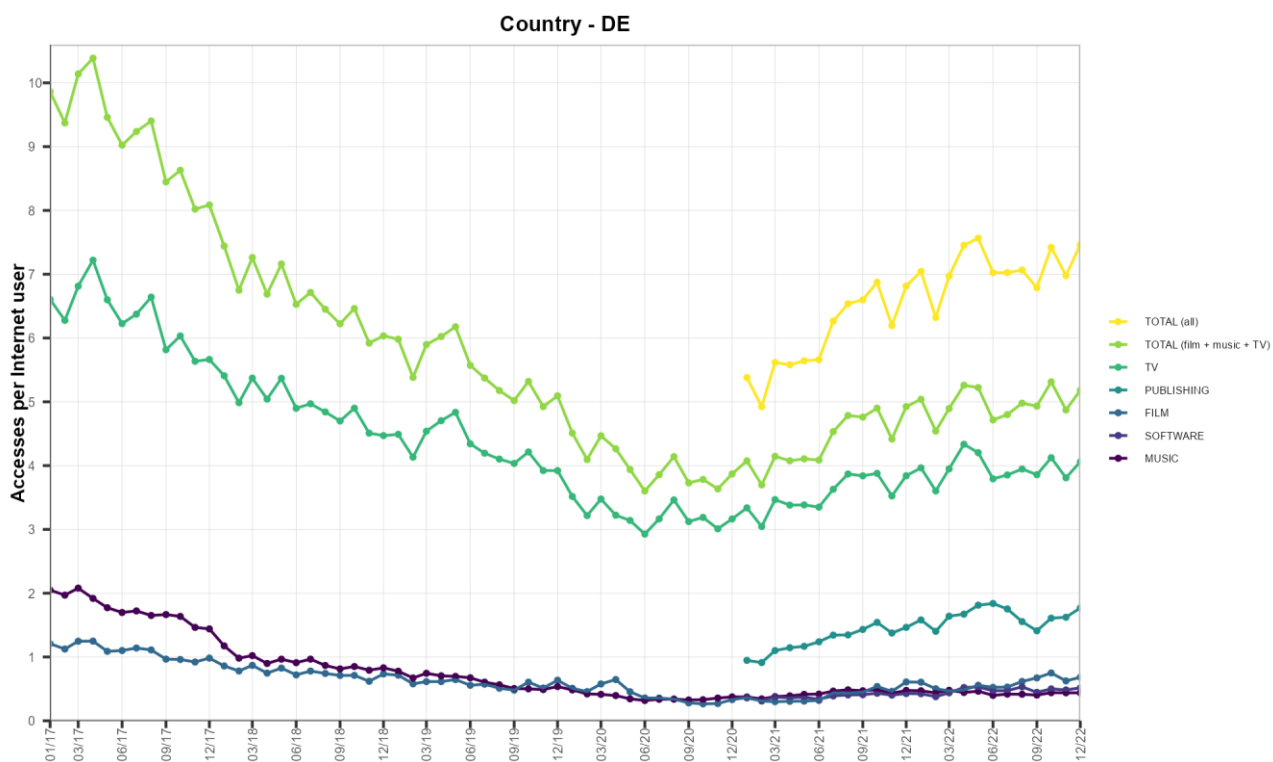
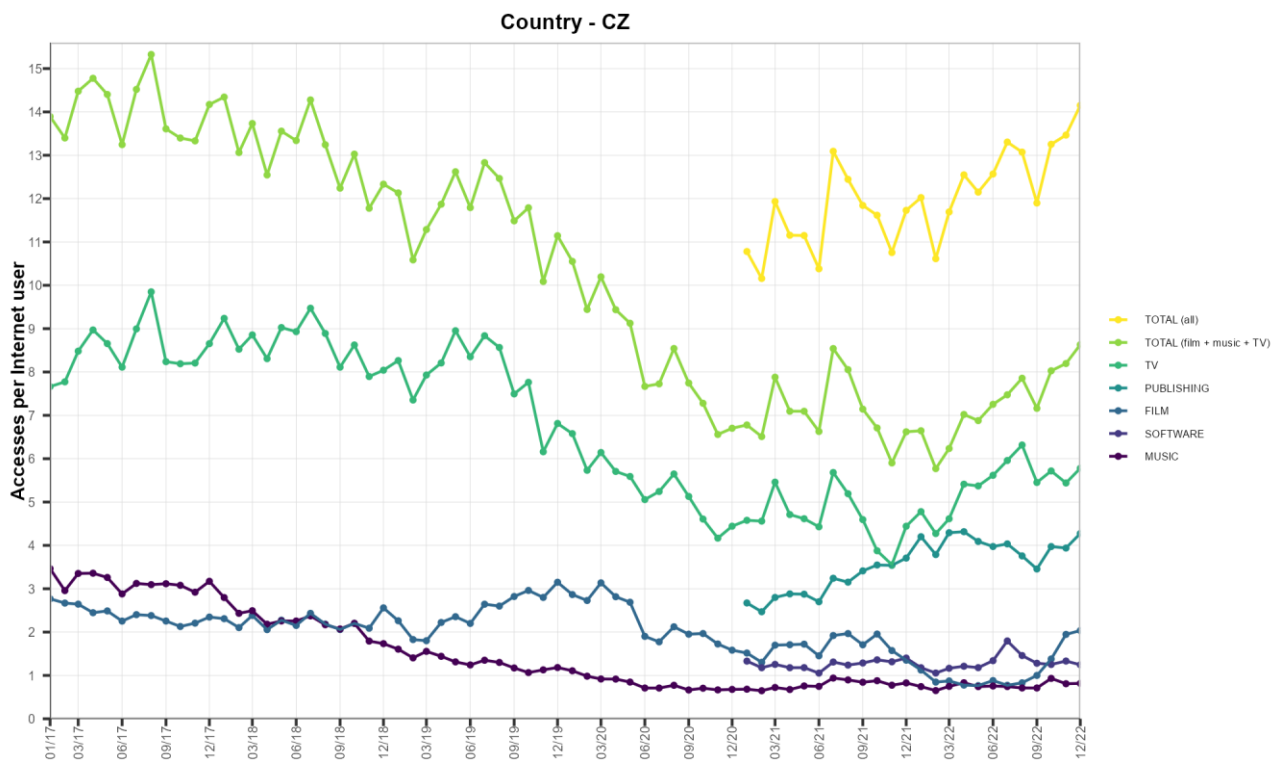
Share per type of CONTENT in each country in 2022



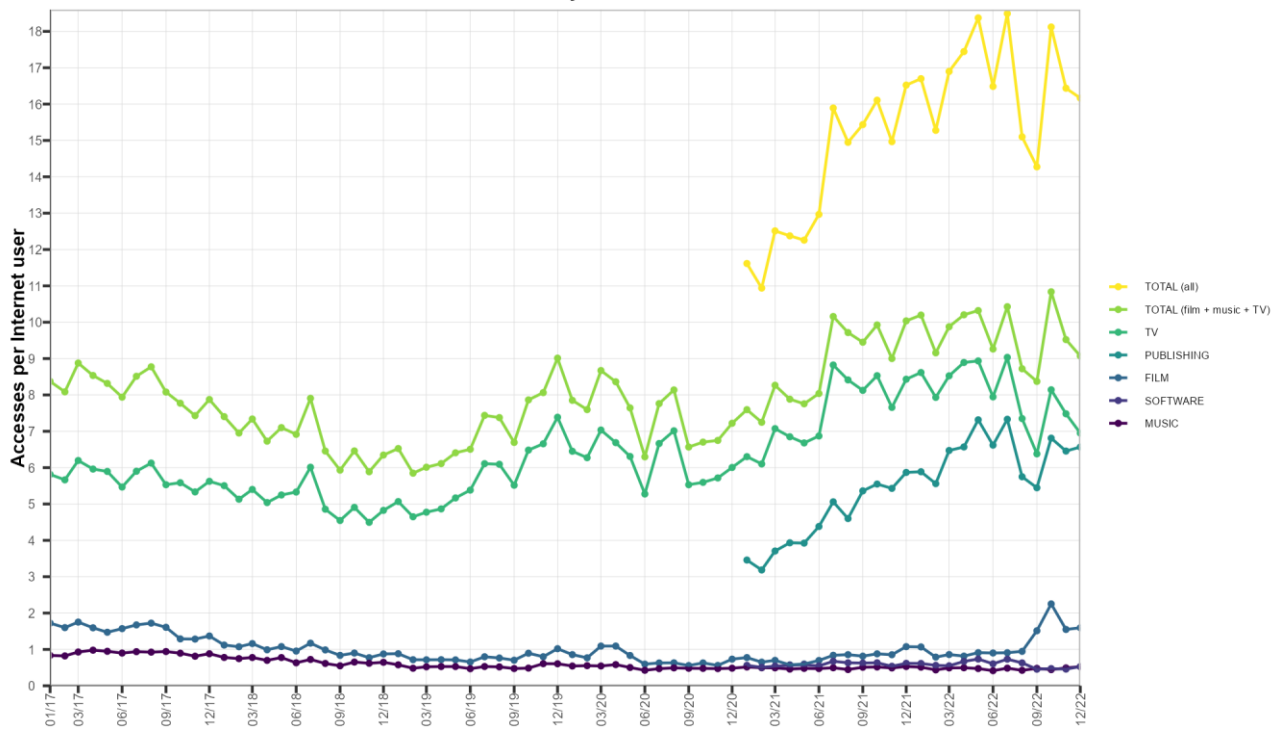




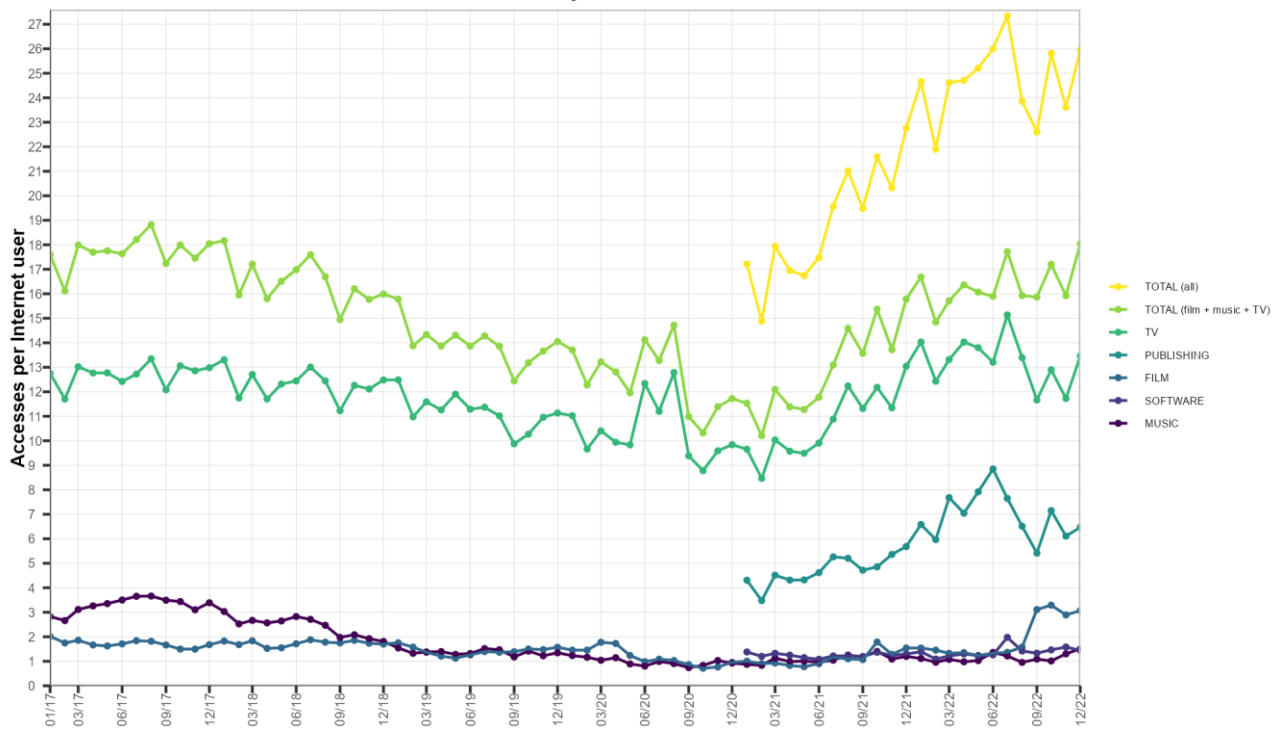




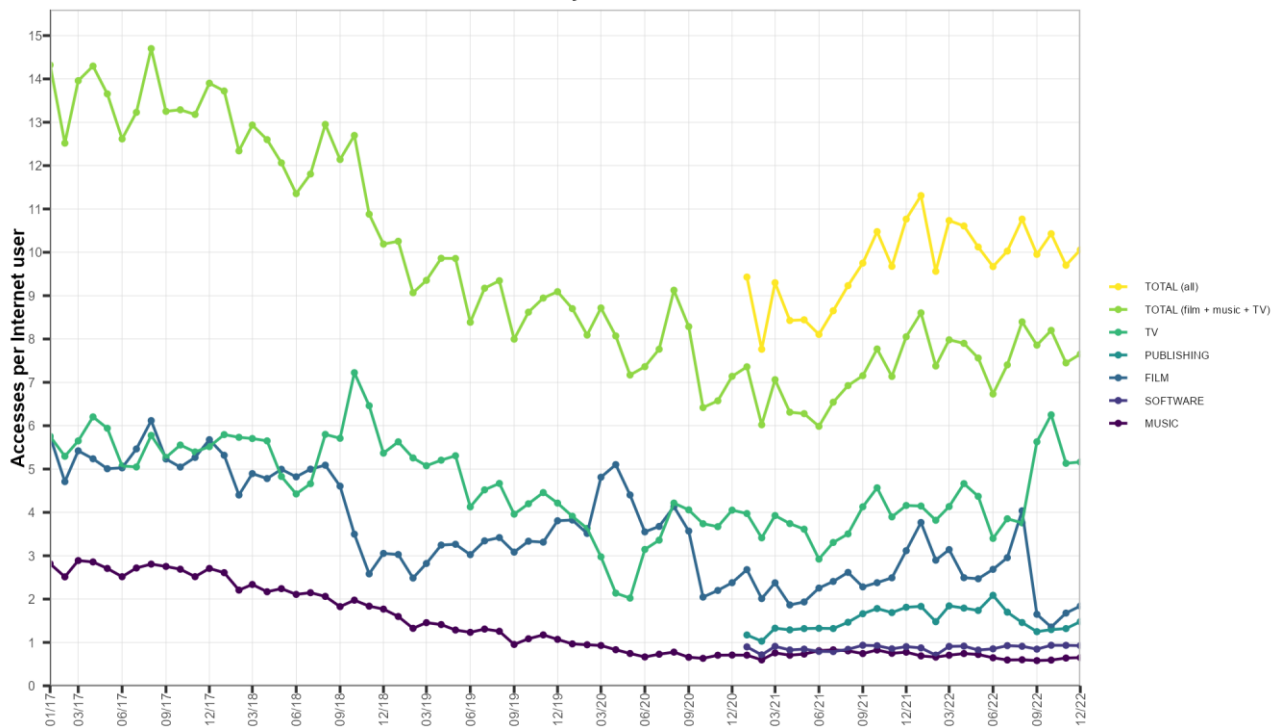
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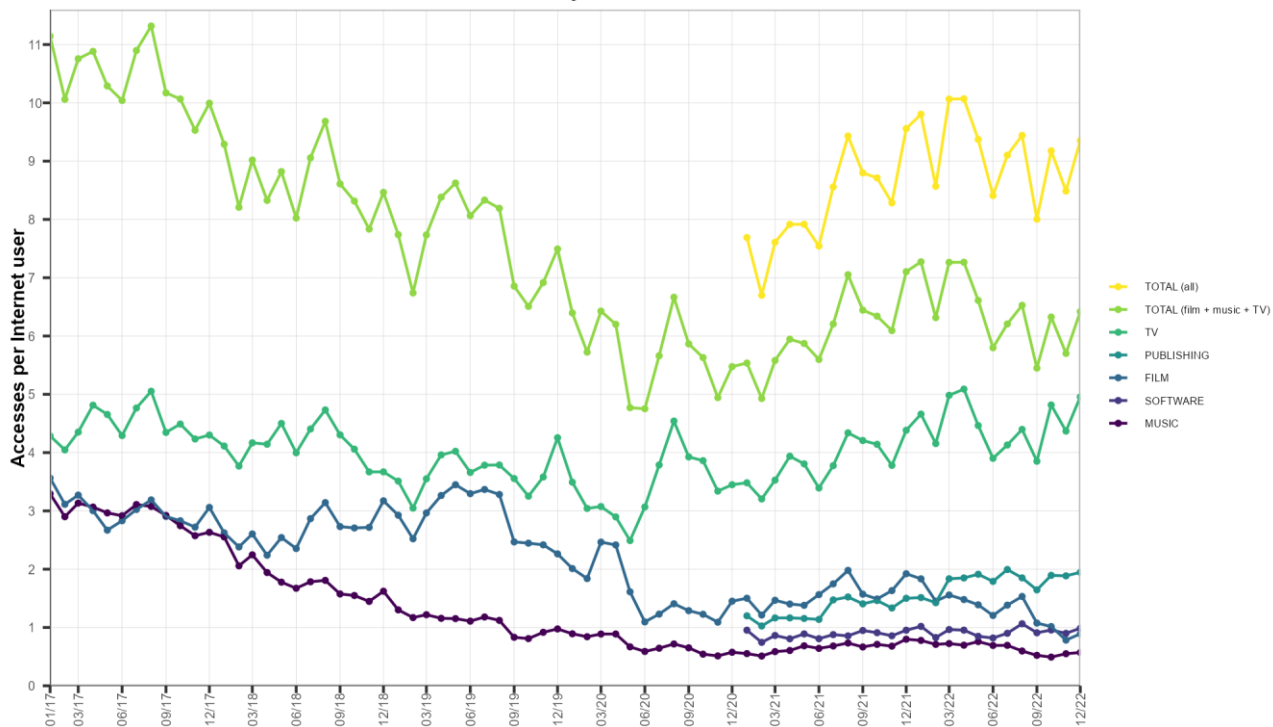
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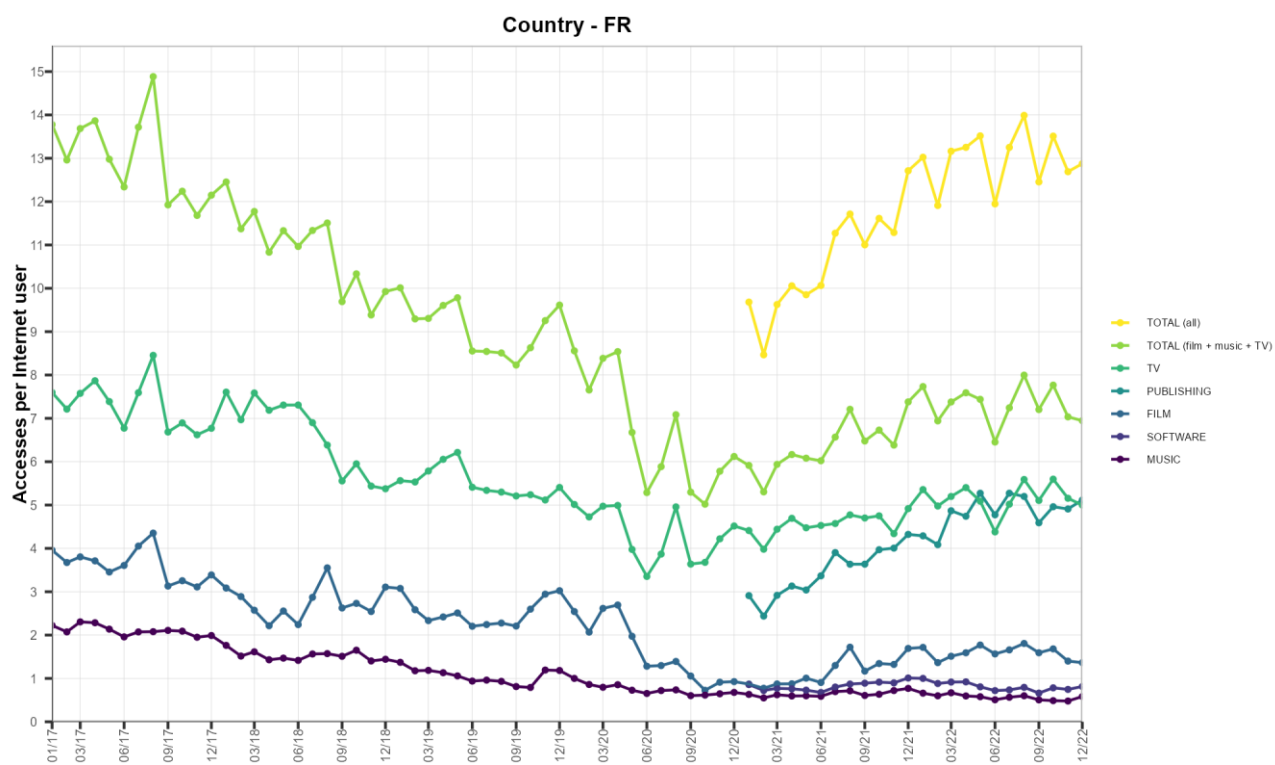
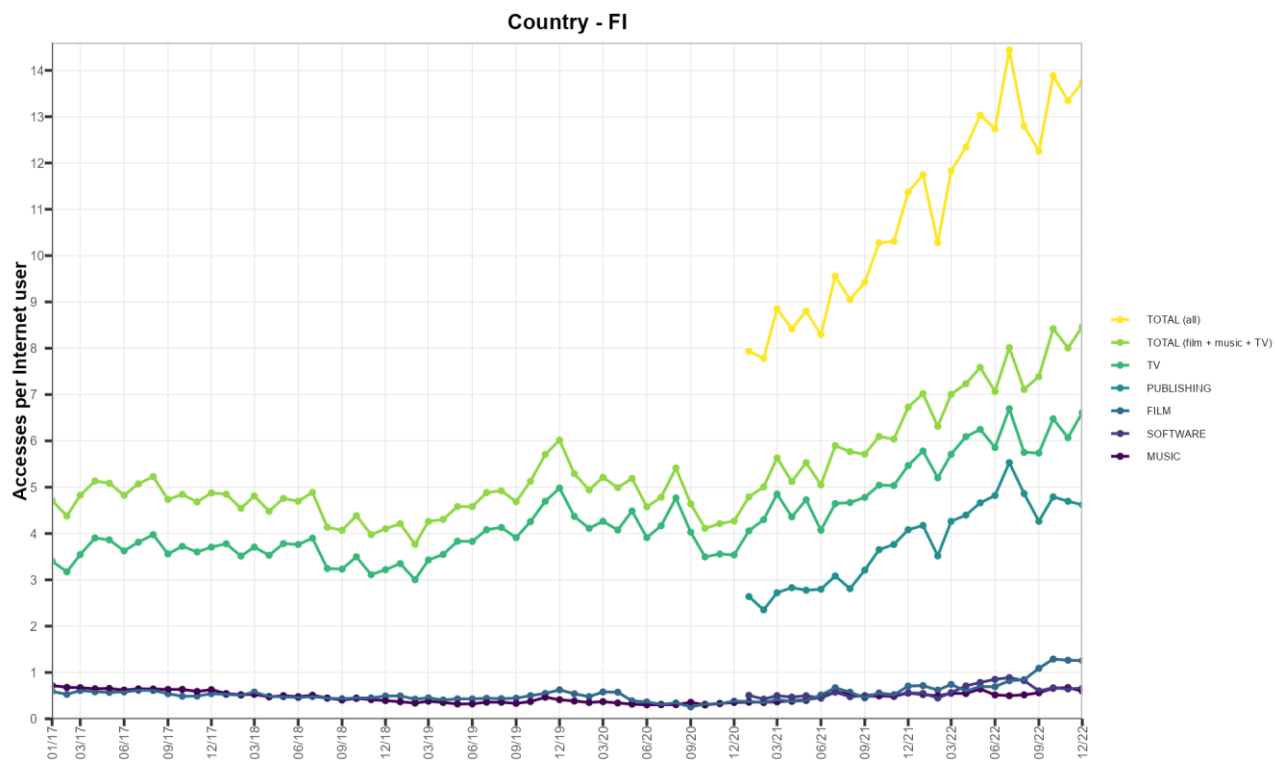


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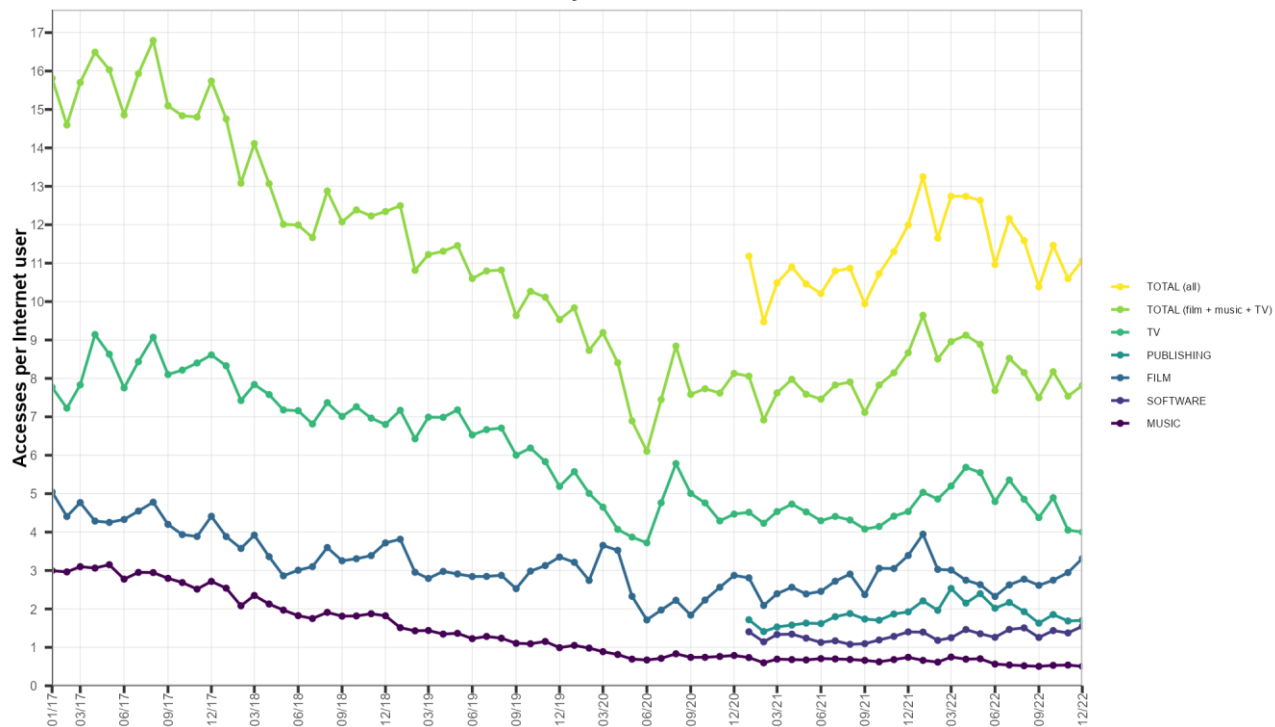


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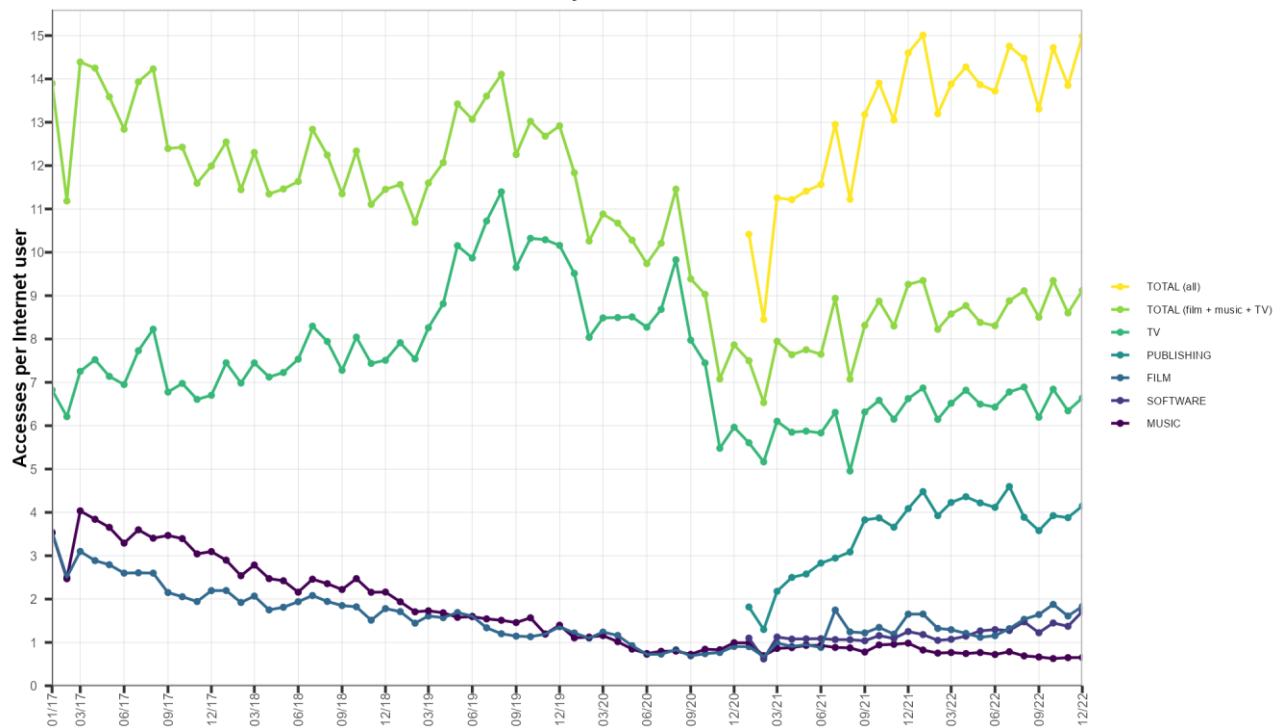




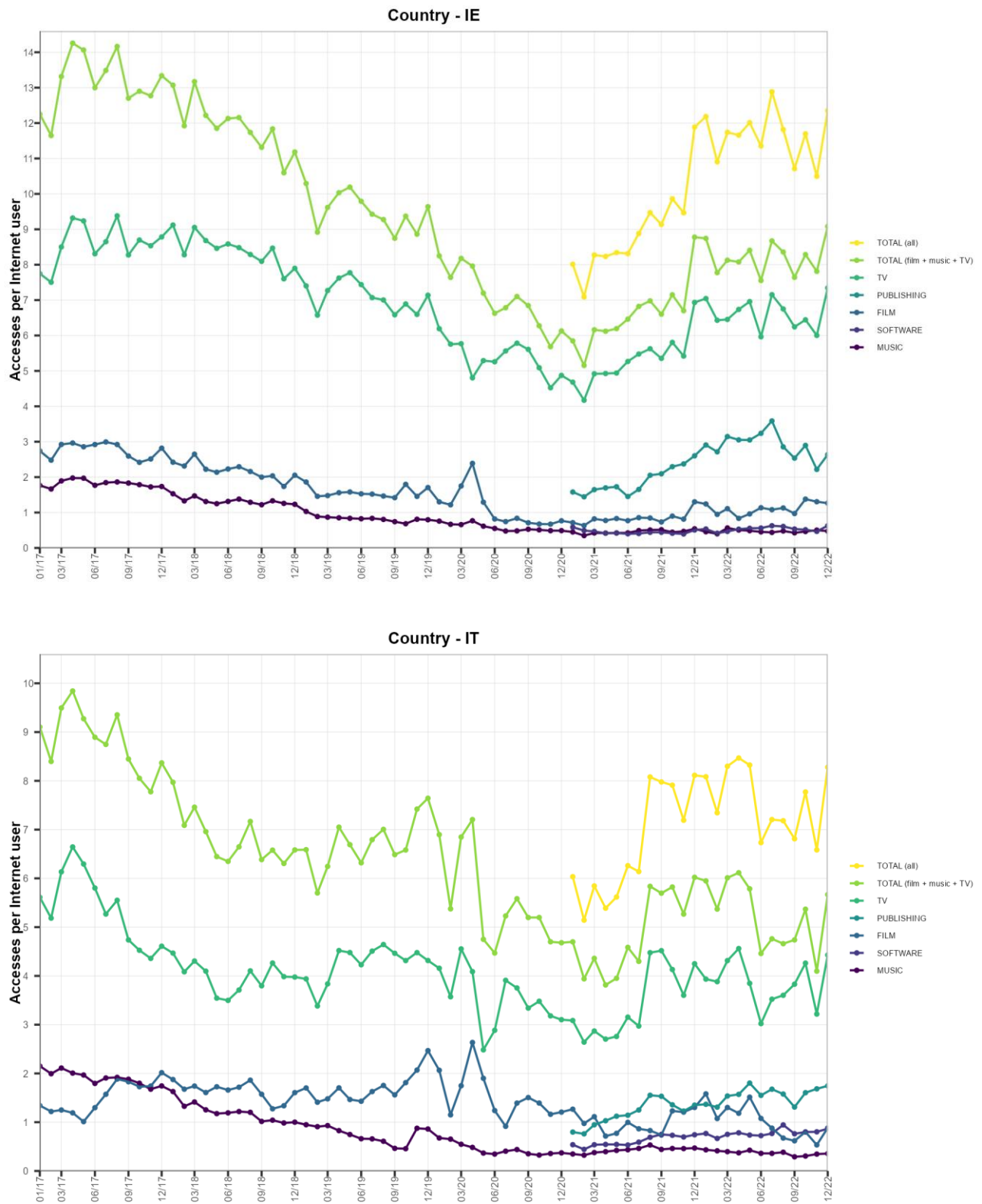
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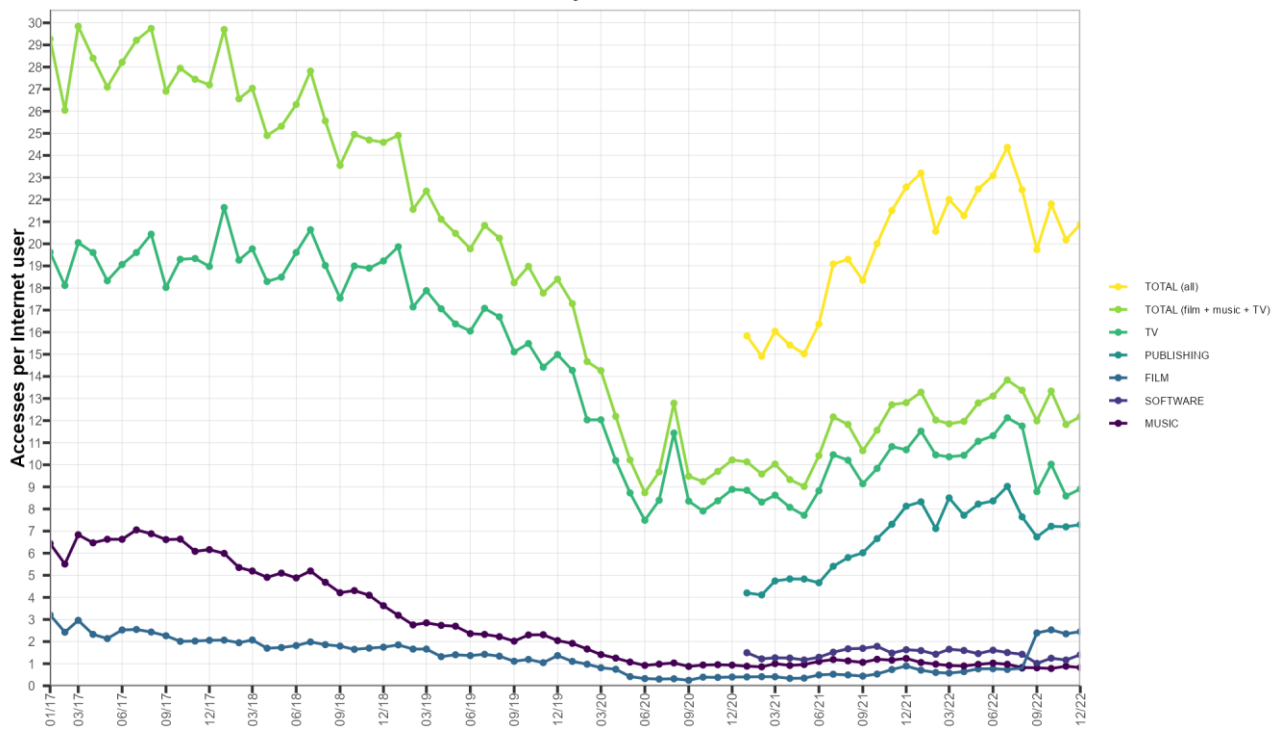




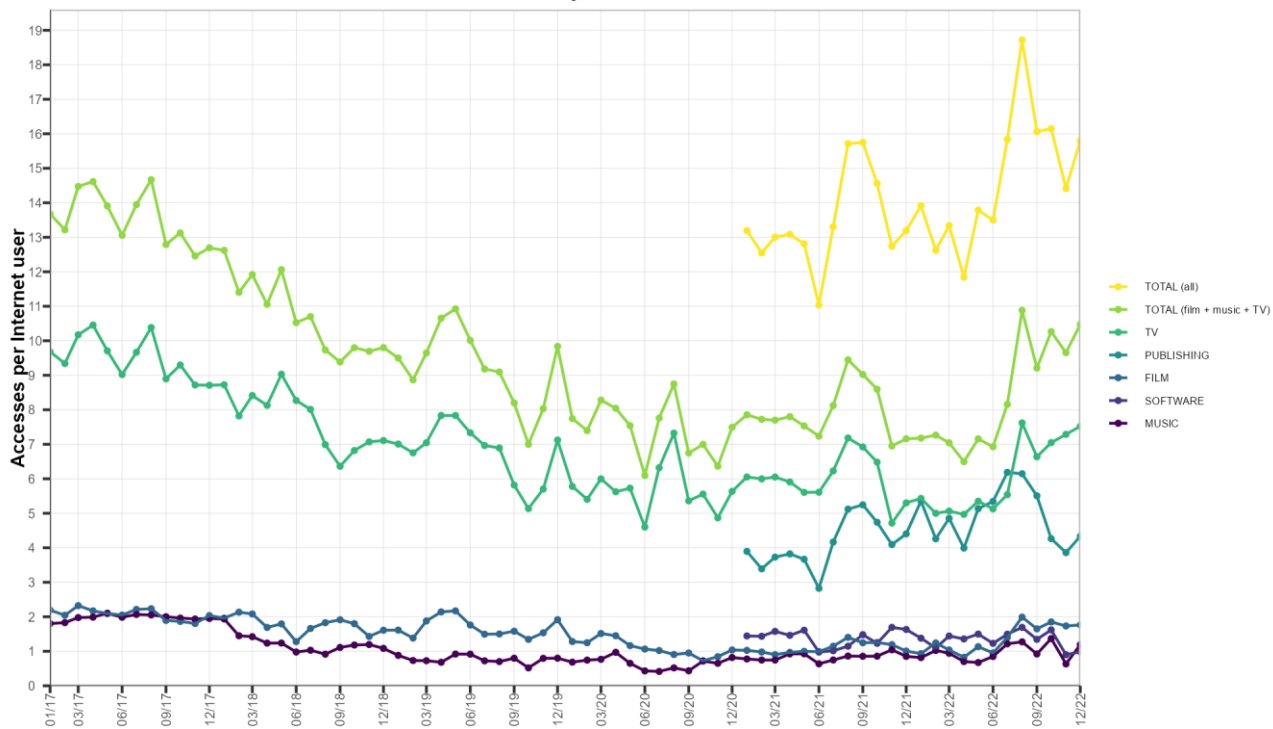




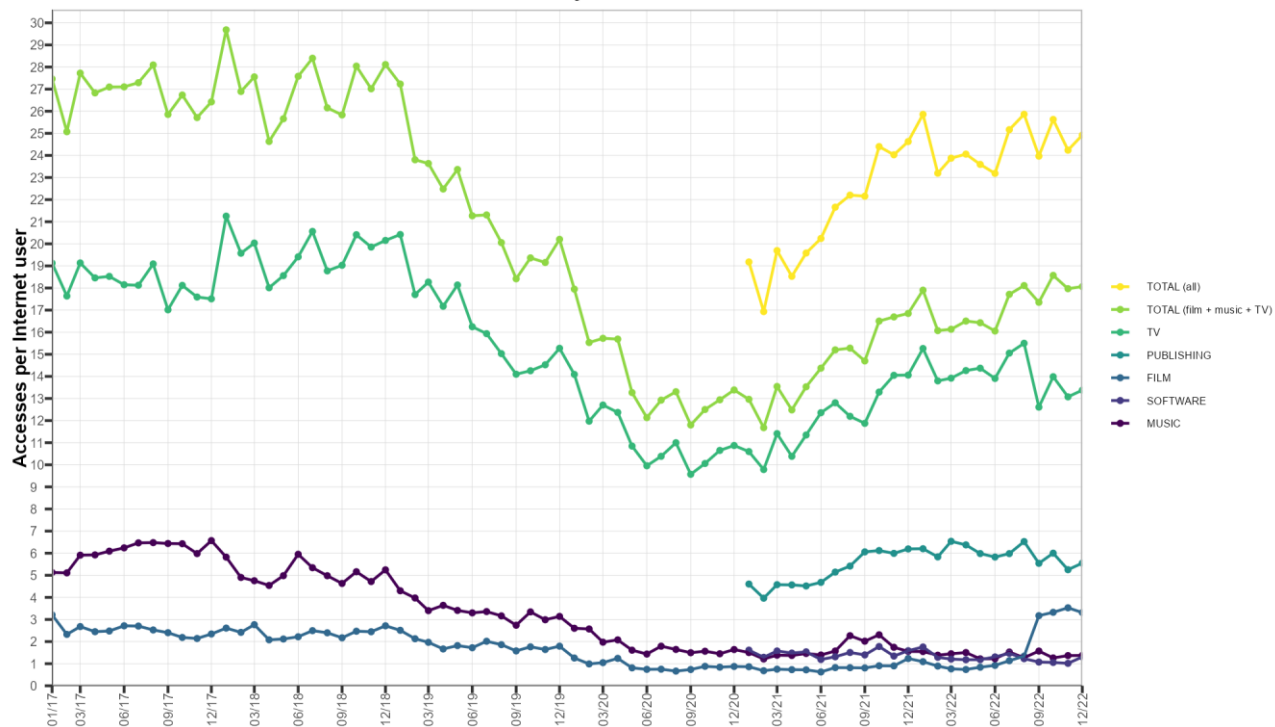
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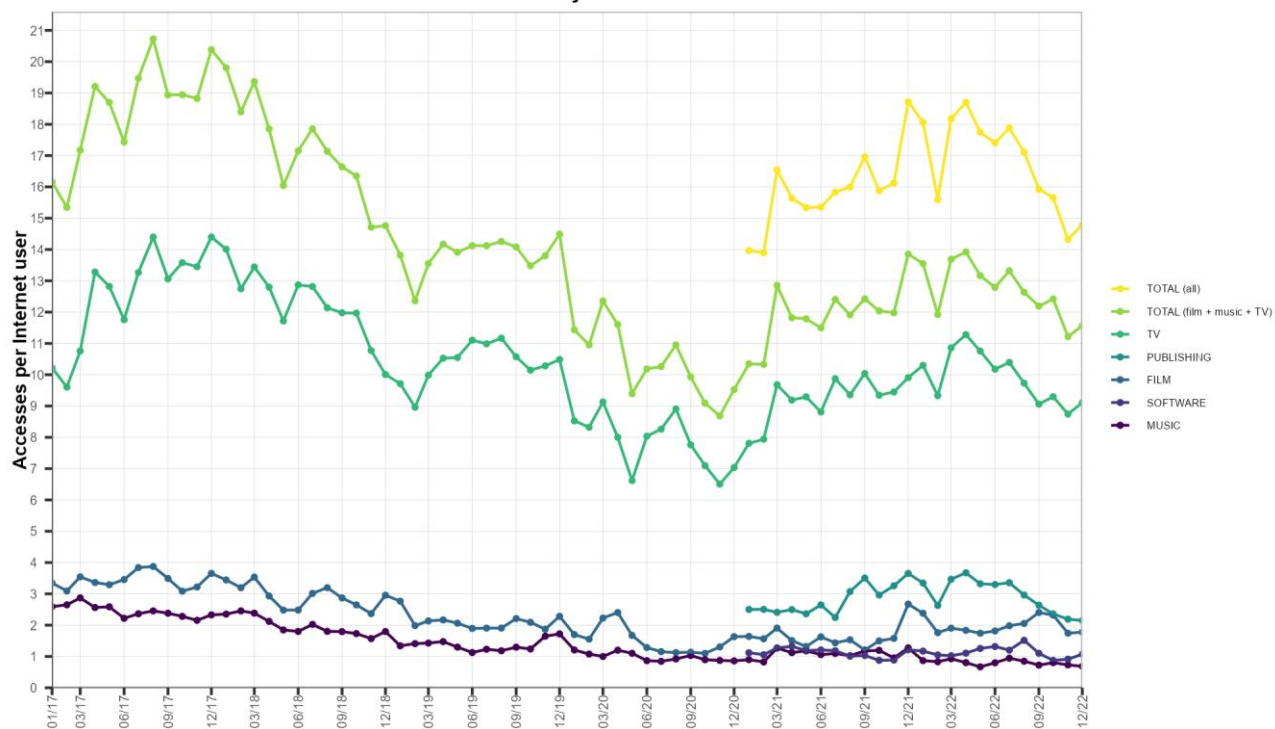
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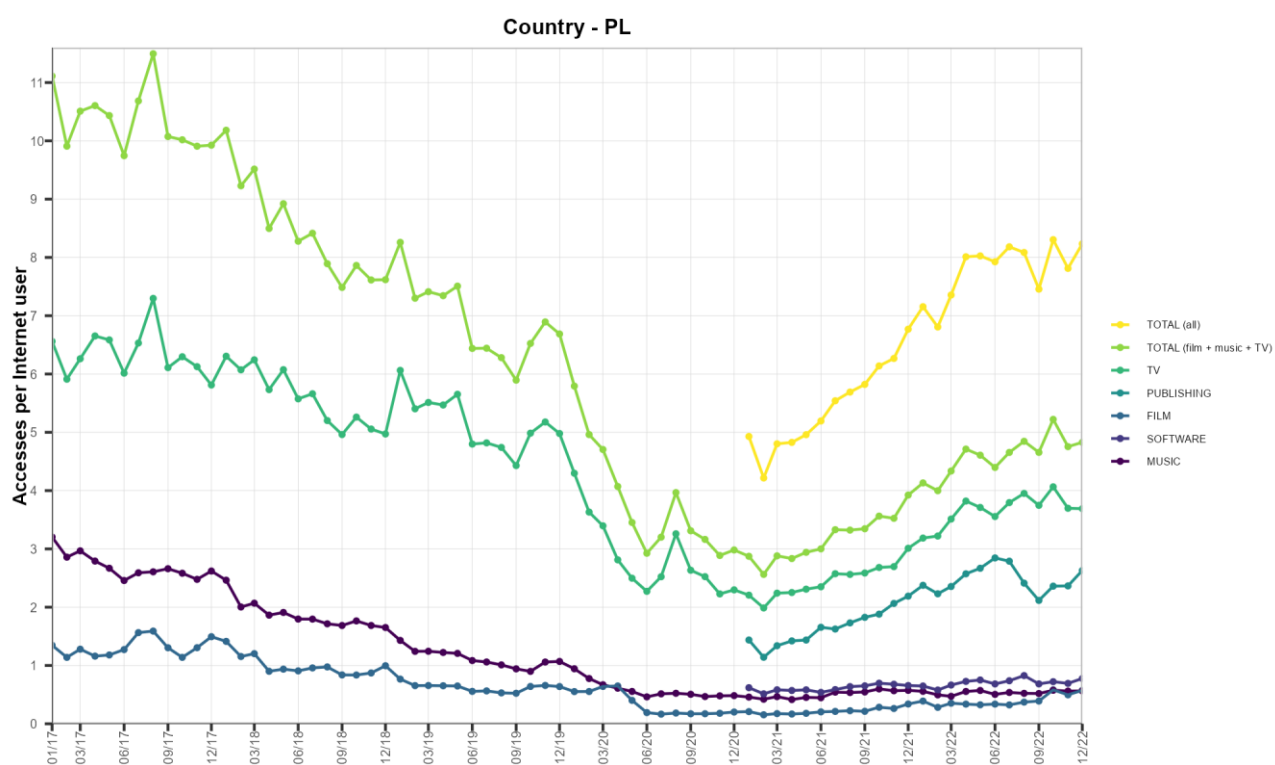
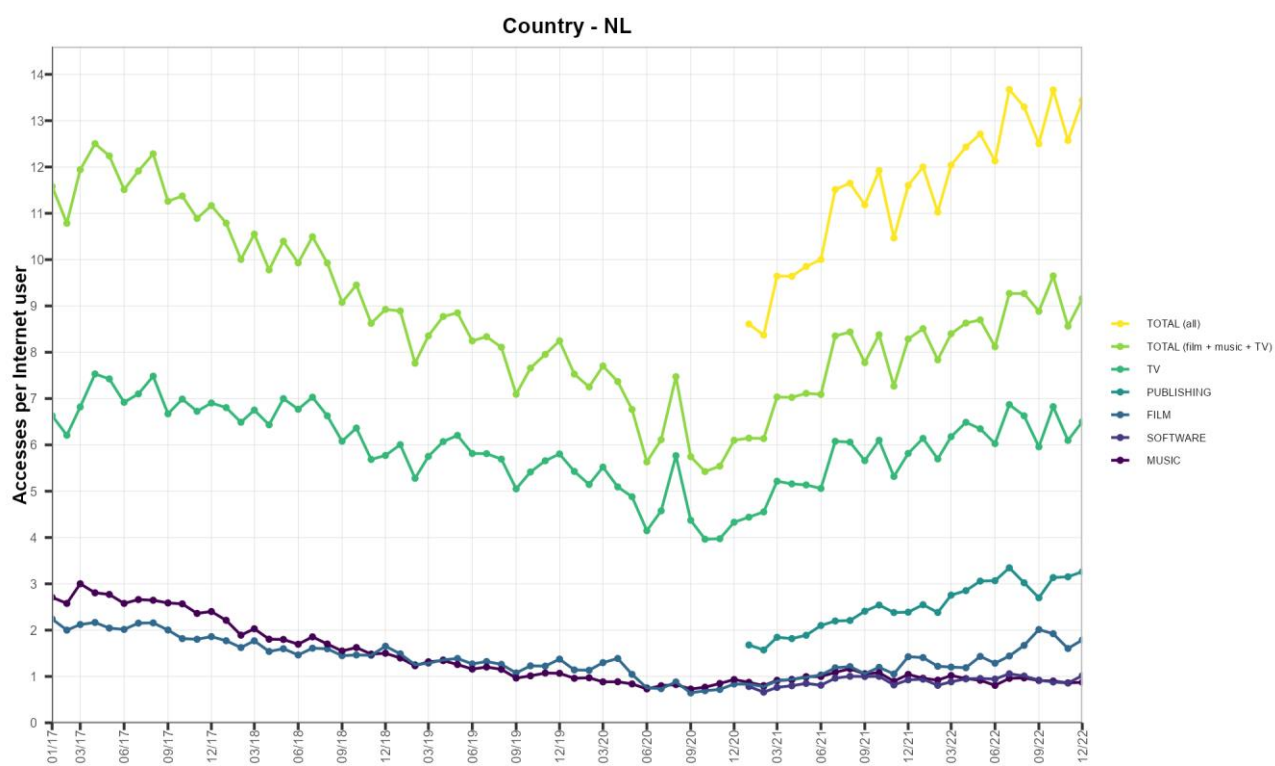


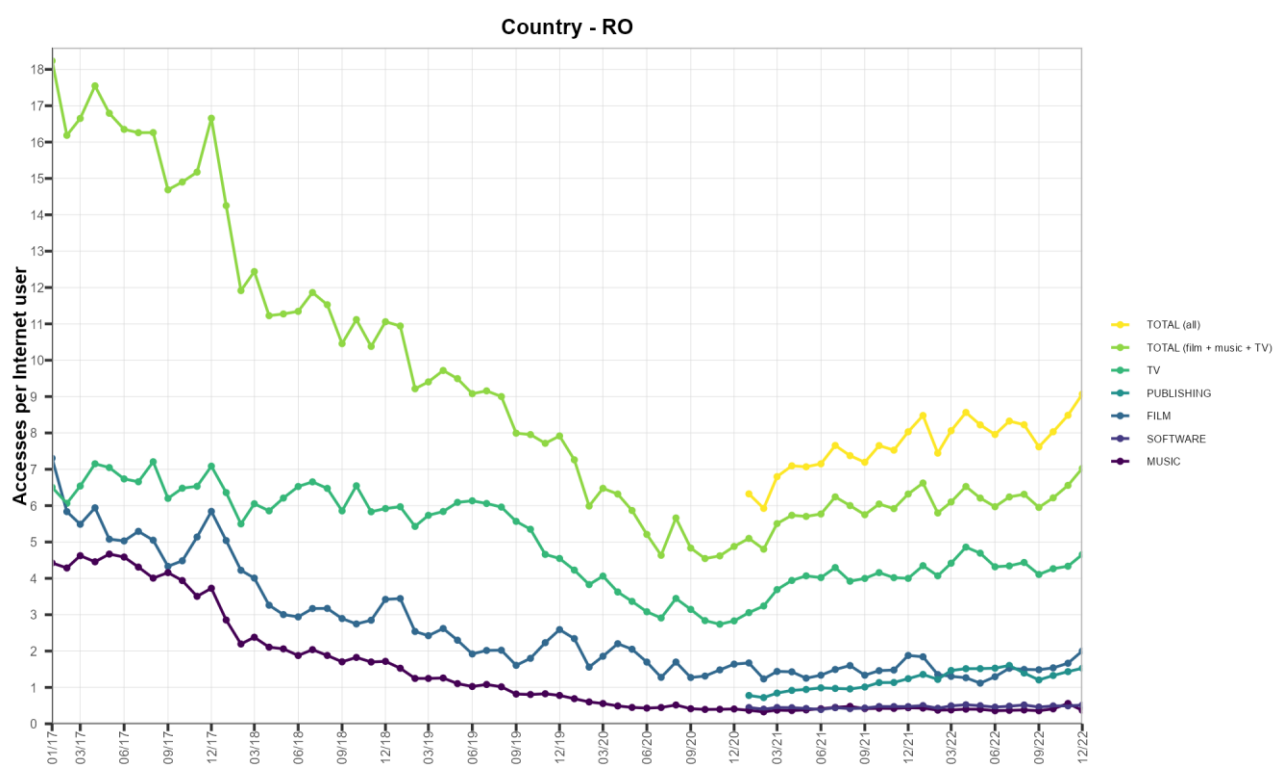
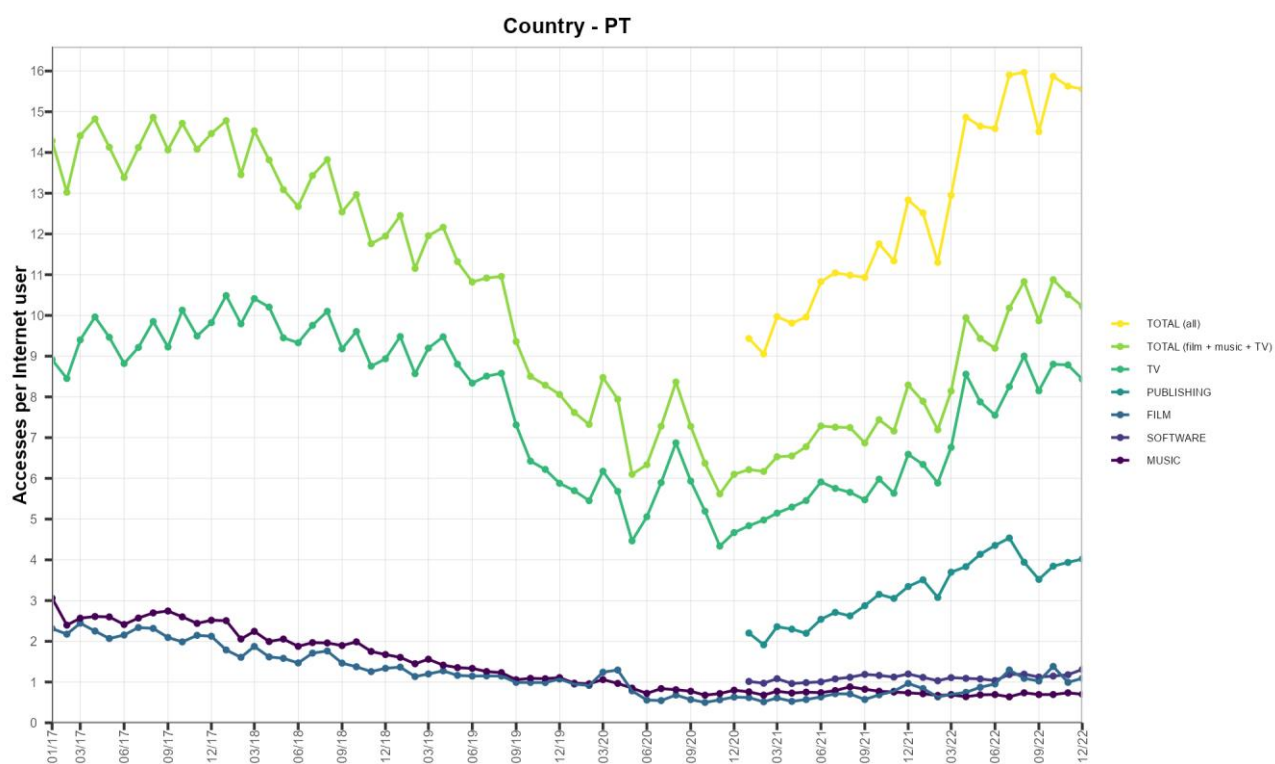
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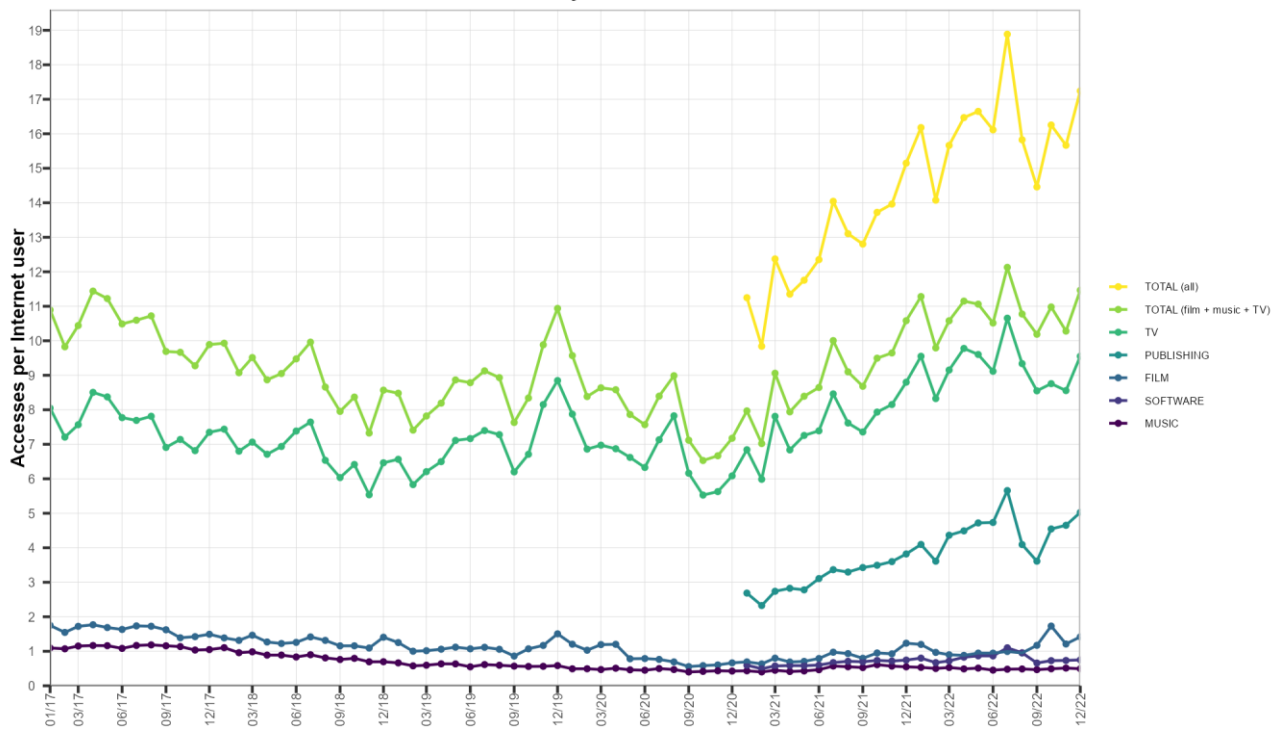
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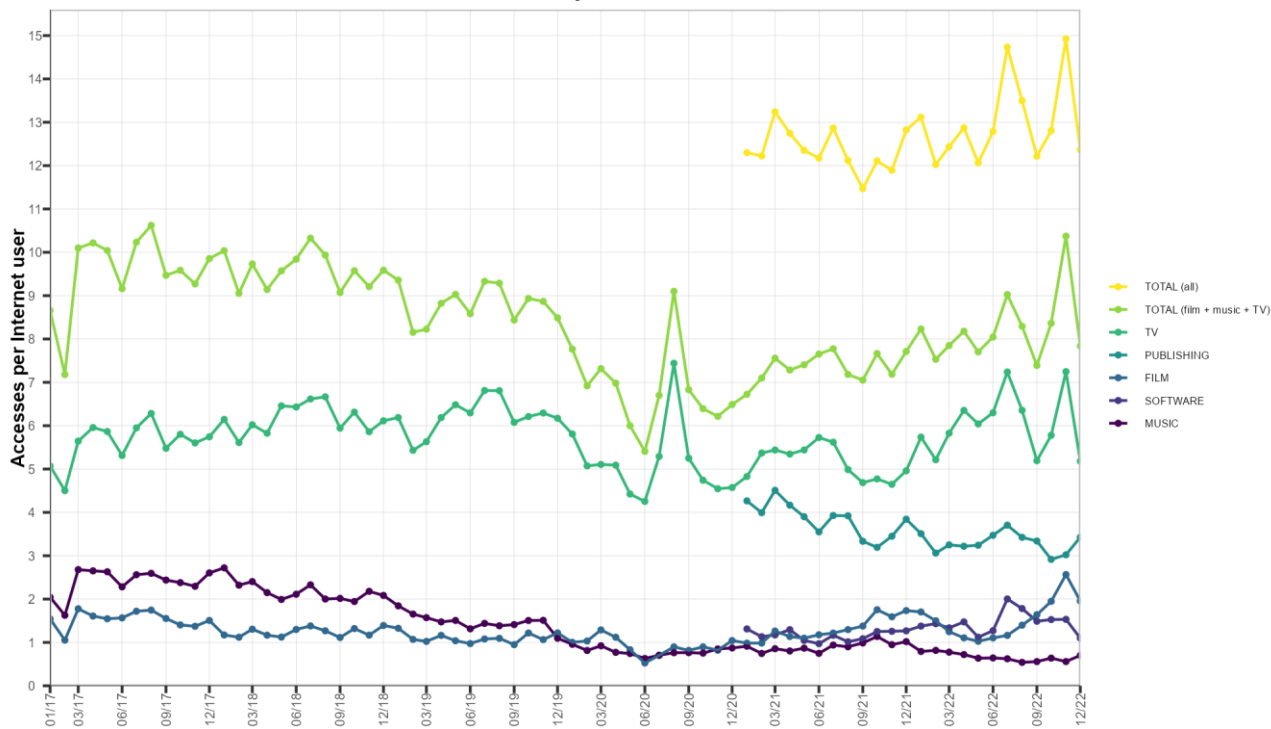


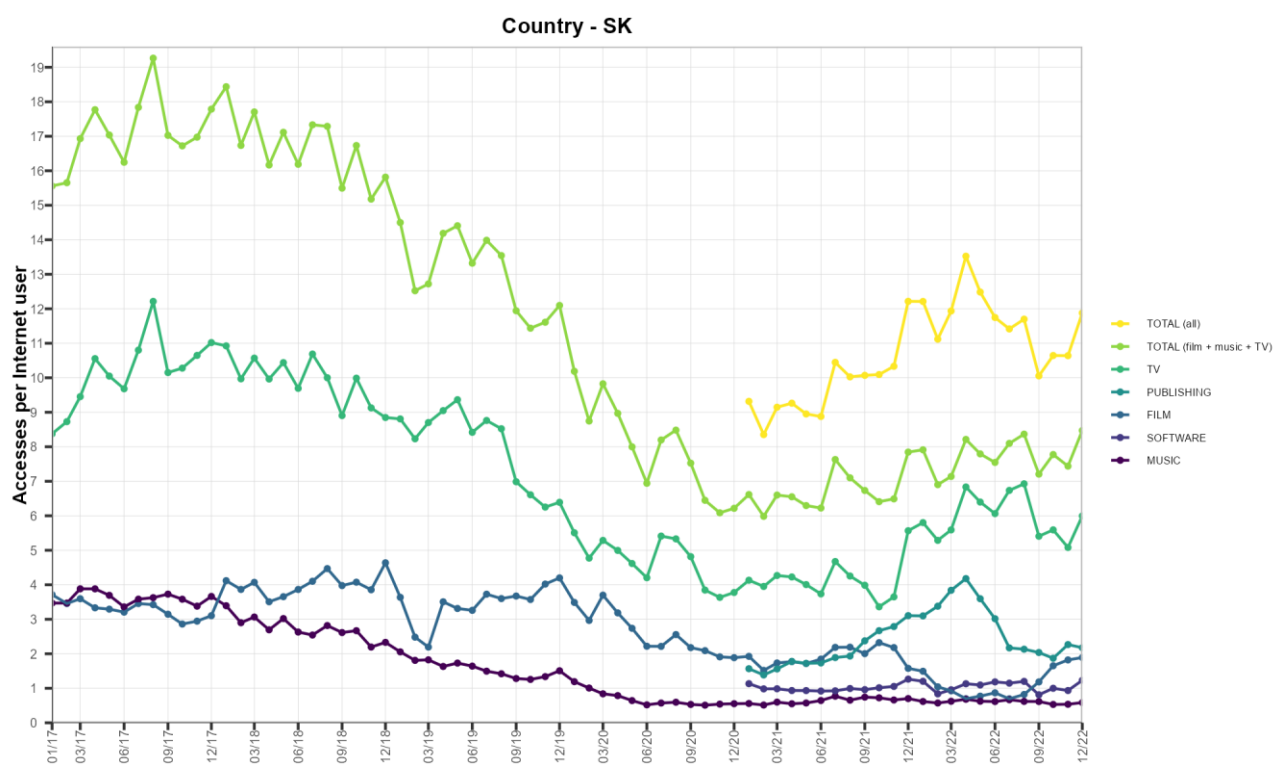


Country - SE



Country - SI





### Annex C Heterogeneity charts for TV, films and music

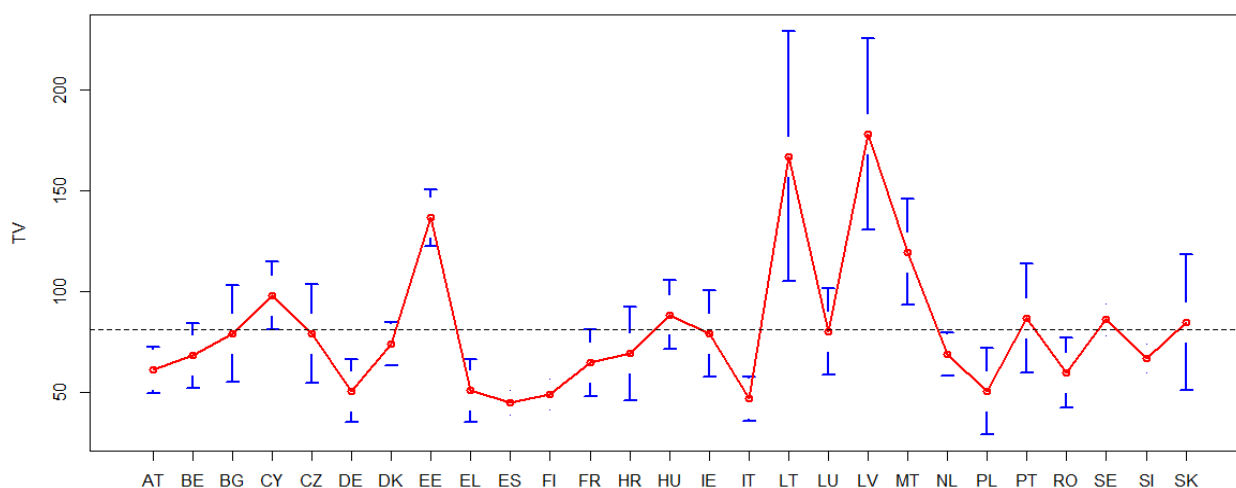


Figure 39: Heterogeneity of TV piracy across countries.

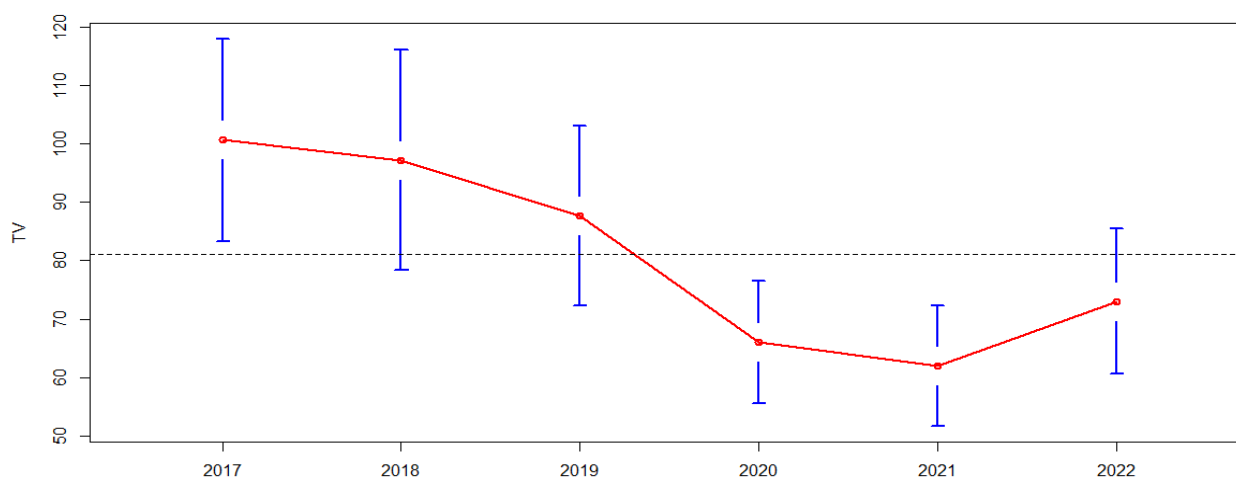


Figure 40: Heterogeneity of TV piracy across years

Note: the red line represents the mean for each country/year while the blue bars correspond to the 95 % confidence interval.

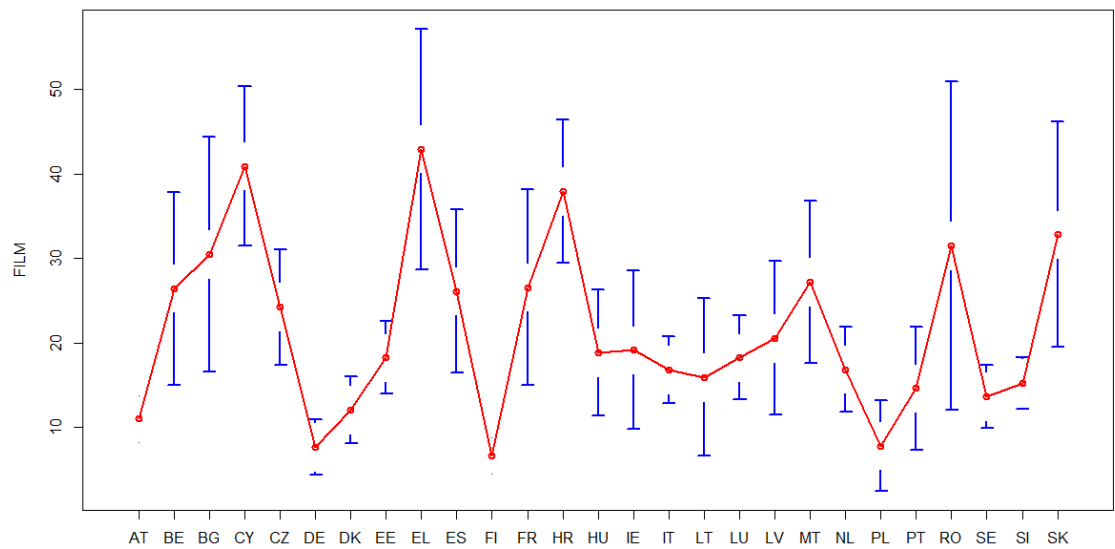


Figure 41: Heterogeneity of film piracy per country

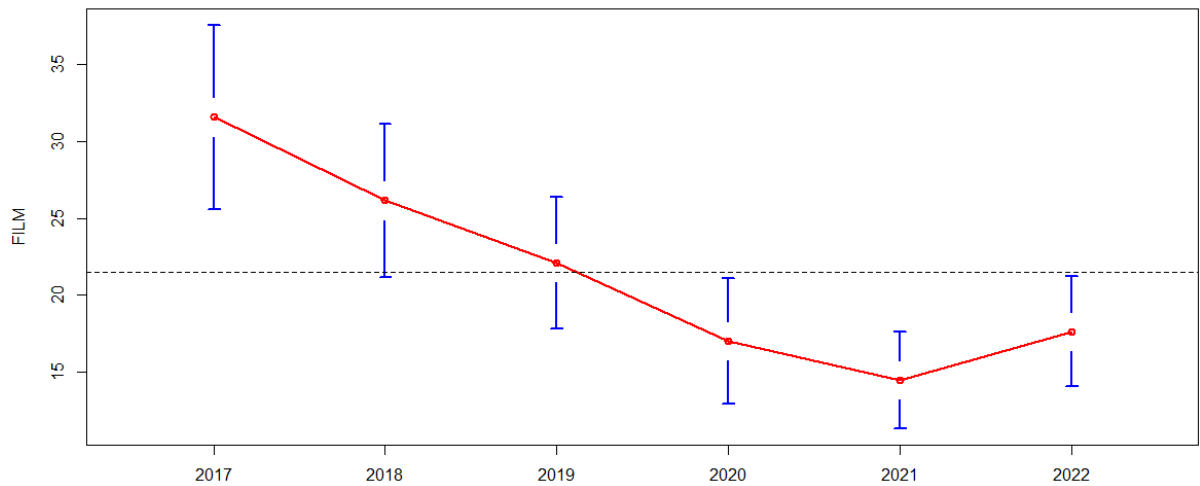
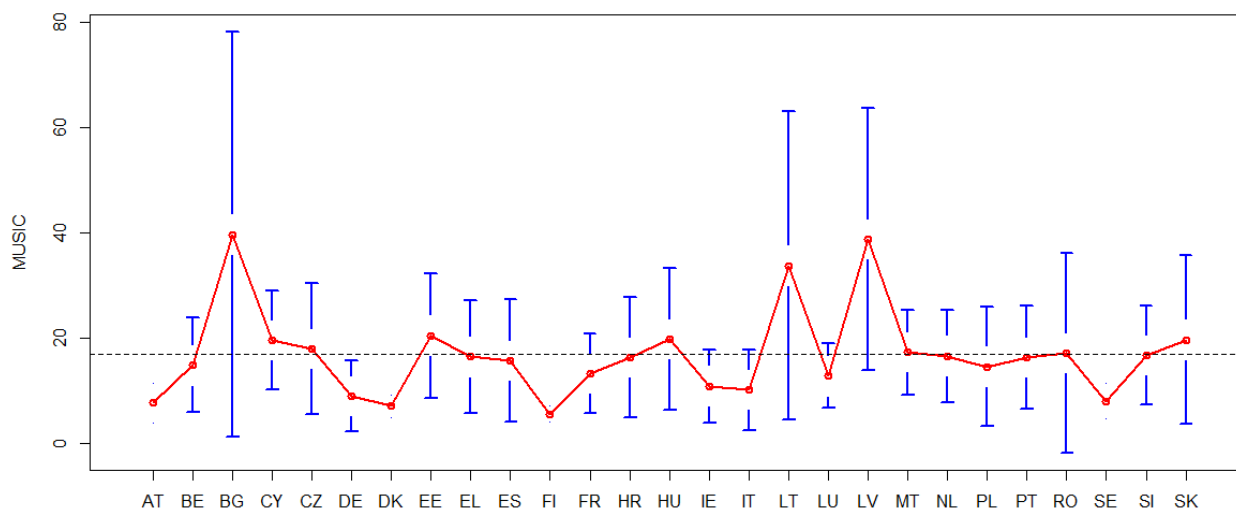


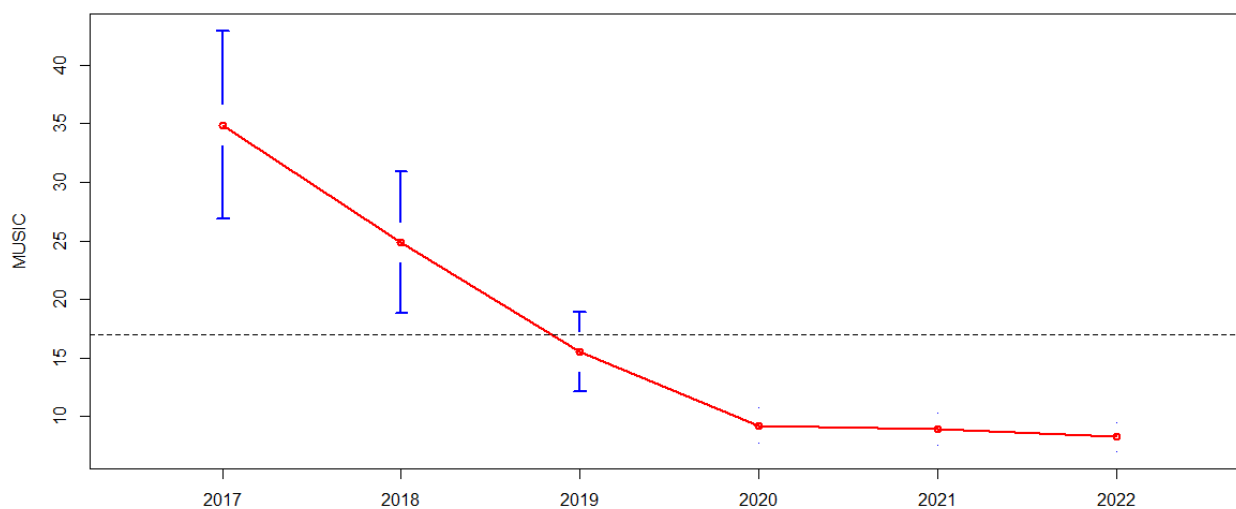
Figure 42: Heterogeneity of film piracy across years







**Figure 43: Heterogeneity of music piracy per EU Member State**



**Figure 44: Heterogeneity of music piracy across years**

## ONLINE COPYRIGHT INFRINGEMENT IN THE EUROPEAN UNION FILMS, MUSIC, PUBLICATIONS, SOFTWARE AND TV (2017-2022)

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