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Investigating the dynamics of illegal online activity: The power of reporting, dark web, and related legislation

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ABSTRACT

This paper aims to shed light into the operation of SafeLine, the only Greek Hotline for illegal online content, and its seventeen years of successful operation as a member of INHOPE, the International Association of Internet Hotlines. The operation of SafeLine is introduced and an analysis of the received reports during its operation is attempted, in order to reveal hidden trends over the seventeen years. Furthermore, a comparison between the reports of SafeLine and the reports of the other 48 national hotlines, members of the International Association INHOPE, operating in 43 different countries spanning six continents worldwide is presented.

Another main contribution of this paper is a correlation analysis between SafeLine's reports and dark web data. Specifically, SafeLine's reports are compared against the ALTAS dataset of the Voyager system of Web-IQ, drilled from the dark web, revealing a correlation of more than 50% between the reports received by SafeLine and the domains of illegal sites discussed in the dark web.

Last, but not least, an analysis of the legislative framework concerning Child Sexual Abuse Material (CSAM) in all country members of INHOPE, European and outside Europe is attempted, revealing similarities as well as differences in what is considered illegal, the ways CSAM is tackled, and the penalty limits prescribed in various countries.

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1. Introduction

SafeLine is the only Greek Hotline for reporting illegal internet content and activity. Its main purpose is to reduce the

amount of illegal, and mainly child sexual abuse material on the internet and generally, to help protect minors while online (SafeLine, 2019). Specifically, SafeLine assists eliminating audiovisual material that portrays ill-treatment of minors, safeguards children's rights for safe online surfing and re-

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duces racist, xenophobic, violent and other illegal content, by accepting reports from users about websites, newsgroups, P2P systems, and social media sites for illegal online content (Christodoulaki and Fragopoulou, 2010).

This paper provides an overview of the activities of the Greek Safer Internet Center focusing on SafeLine. In 2019, SafeLine completed seventeen years of successful operation and published a statistical analysis of the reports received in the period 2003–2019 (SafeLine, Annual Report SafeLine, 2018). This paper aims to provide insight into the 34,590 reports received and to perform a quantitative analysis of the data. Specifically, the analysis contains the content type of the cybercrime reports (e.g. child abuse material, child trafficking, online fraud, hate speech, etc.) as well as the changing trends on the content and activity observed over the years. Furthermore, it compares these trends to those from the INHOPE International Association, which gathers data from its 47 national member Hotlines.

Moreover, SafeLine uses a system (Voyager, 2019), which offers large-scale web crawler technology for collecting and monitoring dark net datasets, in order to deliver intelligence that is both targeted and actionable. We analyze these data and compare them against the reports received through SafeLine's reporting channels. Our target is to identify patterns, to create intelligence from our analysis and to further share the results with the law enforcement organizations, thus contributing to the global fight against illegal internet activity.

As a final contribution of the paper, a thorough study of the legislation concerning Child Sexual Abuse Material (CSAM) for all European and non-European country members of the INHOPE International Association. The aim is to present the maximum penalty limits for CSAM crimes in their basic form, without taking into account any aggravating circumstances or any elements beyond the essential components of the crime itself (which might increase the guilt of the offender and thus carry harsher penalties), revealing the need for a harmonization of the legislative frameworks for a crime of such a global nature.

2. SafeLine's operations and report analysis

SafeLine started its operation on April 14, 2003 with the support of the European Commission and has received EC support since then. Together with the Greek Awareness Axis Safer-Internet4Kids (SaferInternet4kids, 2016) and the Help-Line (Help-Line), they constitute the Greek Safer Internet center (SIC), member of the Insafe/INHOPE networks (Insafe, 2019), while its operation has been assigned to the Institute of Computer Science of the Foundation for Research and Technology-Hellas (FORTH, 2019).

As an official member of the INHOPE International Association, SafeLine's first priority is the elimination of photographic and audiovisual material that portrays ill-treatment of minors and to safeguard the right of safe online surfing. In addition, children's harassment through the internet or mobile technology, as well as violence, racism, xenophobia and in general anything that can be considered as illegal according to the Greek Legislation are also SafeLine's concern.

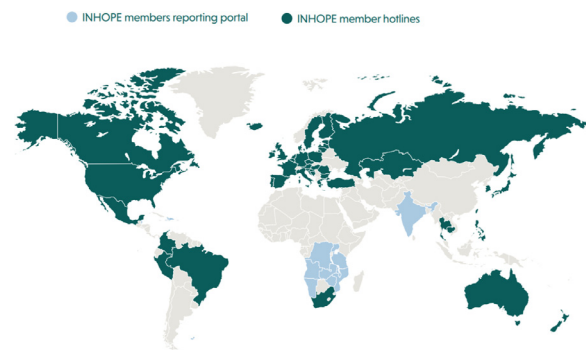


Fig. 1. – Countries members of INHOPE (INHOPE, 2019).

SafeLine plays an intermediary role between online users and prosecution authorities in Greece and Europe while at the same time, it has developed cooperation with Internet Service Providers (ISPs) and administrators of major social media companies (Facebook, YouTube, Twitter, Instagram, etc.) to deal directly with the received reports of users and to effectively eliminate illegal online content. Since there is not yet in place an automatic system capable to identify with confidence illegal and harmful content on the internet, the only alternative means is the reporting from human users who come across such content. Even in such cases, only a trained expert can verify what is potentially illegal and further forward the reported content to the police authorities and other competent bodies.

SafeLine provides the possibility for an easy and anonymous contact through its website www.safeline.gr, where the user can click the button “Make a Report Online” to send a report of the illegal content she/he encountered online. Specialized analysts of the Hotline process the reports and either forward them to the law enforcement authorities or take the initiative and proceed to the actions that will directly remove the illegal material from the internet. Over its 17-year period of operation, SafeLine processed more than 34,590 reports, with an average of more than 4,000 reports per year in the last 5 years. In 2019, the number of reports exceeded the grand total of 6,500. SafeLine's report analysts verified 13,000 of the reported content as illegal, forwarded it to the Greek Police Authorities (Greek Cyber Crime Unit) and entered it to INHOPE's ICCAM database, which operates at INTERPOL's headquarters in Lyon, France, and gathers unique CSAM URLs from all over the world.

2.1. SafeLine as a member of INHOPE

SafeLine became an official full member of the INHOPE International Association of Internet Hotlines (INHOPE, 2019) in 2005, while it has been a provisional member since 2003. INHOPE was founded in 1999, and is a global network currently counting 47 national internet Hotline members in 43 countries spanning six continents (all EU member states, Russia, South Africa, North & South America, Asia, Australia and New Zealand), all sharing the common mission of combatting the spread of online child sexual abuse material (Fig. 1). To achieve this mission, INHOPE has five specific objectives

([INHOPE, 2018](#); [INHOPE, 2019b](#)). The first objective is to establish policies and best practice standards for Hotlines while encouraging exchange of expertise among its members through fostering good working relationships and trust. The second is to ensure rapid and effective response to illegal content reports around the world by developing consistent, effective and secure mechanisms for exchanging reports between Hotlines internationally and to ensure that a coordinated approach is followed. The third objective is to expand the network of INHOPE Hotlines around the globe by identifying and supporting new Hotlines to become members, providing consultation and training to meet best practice standards. The next objective is to promote a better understanding of the work of Hotlines to policymakers at an international level, including government, law enforcement and other related bodies, with the aim of achieving better co-operation internationally. And finally, the last objective is to raise awareness of INHOPE and member Hotlines with key stakeholders as well as the general public as a "one stop shop" for global reporting of illegal content from around the world especially Child Sexual Abuse Material.

In 2015, a transition was made from the old IHRMS INHOPE database to the new ICCAM platform which was critical for the handling of reports and boosted the effectiveness of Hotlines operating under the supervision of INHOPE. The new pioneer system is faster, more accurate and provides improved data, offering vital information to law enforcement. ICCAM is a database of unique CSAM URLs and material and "ICCAM provides vital intelligence to law enforcement, including INTERPOL, in identifying previously unseen CSAM and supports the process of victim identification". This speeds up action and collective activity is crucial to saving the children involved. INHOPE has audited SafeLine, regarding compliance with standards, procedures and best practices, as set out in the INHOPE Quality Assurance Program and obtained in 2019 the INHOPE Certificate of Quality and membership ([SafeLine, 2019](#)).

2.2. Report processing

Any individual who encounters online content believed to be illegal, according to the Greek legislation, has the right to make a report to SafeLine using one of the following different ways; On-line, by filling in the reporting form available at www.safeline.gr/report/, and by e-mail, sending a message to report@safeline.gr. In case someone simply has a query, he/she can reach SafeLine by sending an e-mail to: contact@safeline.gr. A person reporting to SafeLine can choose to remain anonymous.

More specifically, the actions taken following a report are: Upon receiving the report, the illegality of the reported content is assessed by specially trained report analysts (based on the Greek law or the best practices of INHOPE's). In case the report contains illegal material the location of the server hosting it is traced. If the content is verified as illegal and is hosted in Greece, then it is forwarded to the Greek Cyber Crime Unit. Illegal reports containing CSAM are inserted into INHOPE's ICCAM database of unique CSAM URLs and through ICCAM the foreign prosecution authorities (INTERPOL, Europol) are notified. If content is hosted in another country that operates a

hotline member of INHOPE, the hotline is automatically notified about the report through ICCAM. Other competent bodies that are notified, based on the type of the report, are the concerned ISPs or social network administrators in order for the illegal material to be directly removed from the internet. SafeLine's statistical tables are updated accordingly, and the Notice & Takedown procedures are followed with the hosting entity. Finally, if it is feasible (i.e., the report was not filed anonymously) feedback is given to the person that submitted it.

The tracing of the content is performed using system tools, such as Command Prompt and Browser tools in order to resolve the IP address from the domain name. By visiting RIR's and IANA's websites, one can trace the responsible RIR for the IP address and resolve the AS number of the ISP. In order to identify whether the content is hosted on the same server as the webpage displaying it, browser features are used. Plugins such as Flagfox and WorldIP are also used in order to trace the hosting location of the URLs. External tools are also available for use, such as CentralOps.net, Cymru.com and YouGetSignal.com.

SafeLine follows specific Notice and Takedown procedures. More specifically, based on the type of the report, the following bodies are contacted:

- *Greek Cybercrime Unit*: if the illegal content or activity is originating in Greece or in case it concerns CSAM material hosted anywhere in the world the Greek Cybercrime Unit is notified.
- *INTERPOL through INHOPE's ICCAM*: if the material is CSAM a report is entered into the INHOPE's ICCAM database. Through this, the international and European Law enforcement authorities (INTERPOL, Europol) are notified, as well as the hotline (if one exists) in the country where server hosting the content is located.
- *ISPs*: if the content is traced in Greece the concerned ISP is notified.
- *Major social media sites*: safeLine is a 'Trusted Flagger' for YouTube and a 'Trusted Reporter' for Twitter and Facebook/Instagram and holds a non-disclosure agreement with Google. When content is related to social media sites it is reported and if assessed to violate their terms and agreements it is promptly removed.
- *Other competent bodies*: based on the type of the report other competent bodies are contacted such as the Hellenic Data Protection Authority (HDPA), the Hellenic Authority for Communication Security and Privacy (ADAE), Consumer Unions, etc.

2.3. Quantitative analysis of reporting data

In order to conduct a quantitative analysis of the reports received by SafeLine, all the reports received during its 17 years of operation have been collected and analyzed regarding content type (e.g. CSAM, Personal Data Violation, Hate Speech, etc.) According to the analysis conducted, most reports received by SafeLine concern personal data and communication violations (38%). This is followed by reports for CSAM (23%)

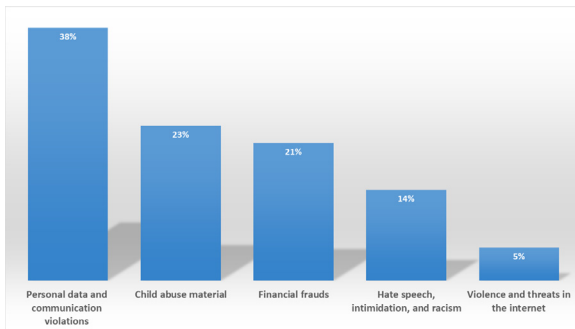


Fig. 2. – SafeLine's report categories 2003–2019.

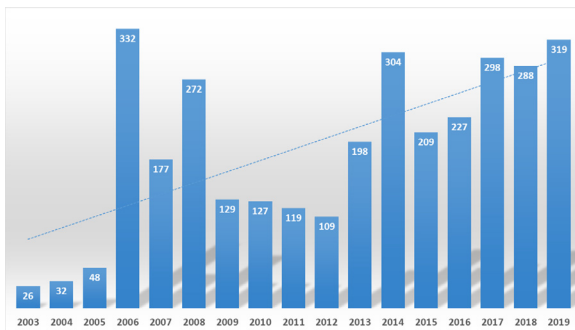


Fig. 3. – SafeLine CSAM reports 2003–2019.

which is SafeLine's main objective and responsibility. In the third place come complaints for online financial fraud (21%), while in the fourth place are incidents of rhetorical hatred and intimidation (14%), followed by incidents of violence and threats on the internet (5%). The categorization of the reports submitted to SafeLine can be seen in Fig. 2.

The reported cases of CSAM (Fig. 3) record a steady upward trend throughout SafeLine's 17-year course at an overall average annual increase rate of about 14%. Particularly over the last two years, these complaints have surpassed every precedent in Greece, confirming the increase in incidents observed throughout the world, through INHOPE's statistics.

Apart from defending children's rights online, SafeLine's also deals with the confrontation of financial online frauds. A remarkable rise is recorded in the complaints of financial online frauds in 2017, a trend which persists in 2018 and 2019. For 2017 and 2018, of all complaints that were verified as illegal, 56% relate to complaints for deceptive but tempting advertisements at very low prices, which were mainly found on Facebook. As a "Trusted flagger" for Facebook, SafeLine informed the social network's administrators with whom it maintains close contact and the reported content was promptly and effectively removed or blocked.

It is striking that during the period 2010–2011, when there was a large increase in the use of social networks by the public, a spike in the complaints about personal data breaches was recorded. By triggering relevant reporting tools by the social networks themselves, the number of complaints is constantly decreasing.

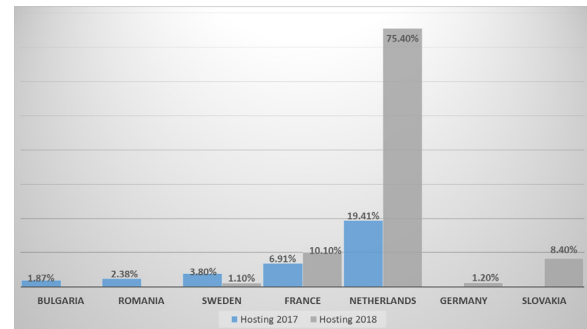


Fig. 4. – INHOPE report statistics 2017–2018: CSAM distribution in EU countries.

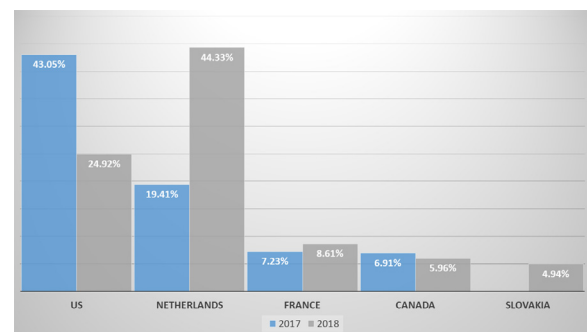


Fig. 5. – INHOPE report statistics 2017–2018: CSAM distribution worldwide.

The incidents of online hate speech showed an explosive increase in 2010, and in 2015 when the related complaints reached 19% of the total. SafeLine has participated in all EU's Monitoring Exercises on online hate speech that brought together NGOs and other competent bodies from all over the world.

During 2017, 259,016 child abuse images and videos were assessed from INHOPE (INHOPE, 2018), while during 2018 the number of assessed images reached 337,588 (INHOPE, 2019). Illegal material was traced in around 70 countries around the world, with USA and, at European level, the Netherlands, being the leaders. In 2017 the USA had the highest amount of CSAM hosting while in 2018 the Netherlands took the lead (INHOPE, 2019). The distribution of CSAM material in EU countries and worldwide can be seen in Figs. 4 and 5.

From the complaints received by INHOPE, 64% of the global illegal content and 58% at the level of Europe were removed from the internet in less than 72 h, thus contributing dynamically to protecting victims and eliminating the phenomenon the posting of images and videos of child abuse (INHOPE, 2019). In Fig. 6, we can see the takedown statistics in days for CSAM content.

Girls in childhood were the most vulnerable group in 2018, as they were portrayed in 80% of the illegal material detected and removed from the internet. A percentage of 90% of the reported illegal material contained images of children 3–13 years of age and 1% images of children 0–3 years old. Finally,

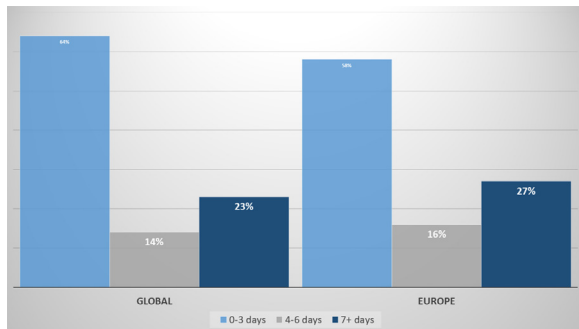


Fig. 6. – INHOPE global report statistics 2018: days required to take down CSAM content.

84% of illegal content is located on image hosting services (INHOPE, 2019).

3. Correlation of SafeLine's reports and the dark web

Assisting in the fight against online child abuse is an essential part of SafeLine's mission. In this context, exploring the dark net (Bradbury, 2014) and gaining insights on this side of the net is one of the latest milestones that SafeLine has set.

3.1. Exploring the dark web with Voyager

In order to gain insight into the dark web, SafeLine cooperates with Web-IQ. Web-IQ has developed the Voyager system (Voyager, 2019) to provide law enforcement, NGO's and local governments with data from the darkest places of the internet. Voyager is a system that contains cached pages from CSAM-sharing forums. The Voyager system crawls, on an ongoing basis, a number of CSAM-sharing forums of the dark web, to provide its users the ability to inspect and investigate these hotspots in a contained environment without the need for actual dark web access. The dataset that contains the extracted cached webpages is ATLAS.

ATLAS dataset indexes a number of dark net forums where child sexual abuse material is shared and discussed. It is available in the form of cached pages, where links can be followed internally, without leaving the dataset. Extensive analyses is performed on the data for the extraction of entities and relations in order to inspect the full activity over multiple sites, the timeline and connectivity of users, and to identify sub-forums by type of activity. Moreover, potential clues about the geographical origin of the offenders and the shared material is visualized. For legal reasons, the ATLAS dataset does not contain images. All visual material are excluded and no images or videos are harvested. Only the context in which these files are discussed is analyzed.

Atlas dataset is useful for a number of reasons, namely to find and secure clues that could potentially identify victims or offenders, to research the offenders' way of operating, and to discover facilitators and potential barriers. Furthermore, to distinguish destination/victim countries from hosting coun-

tries and to identify both clear and dark web platforms targeted by offenders.

3.2. Analysis of data in the dark web

In this section, we drill into the data of the Voyager system. Voyager contains cached pages of discussions in the dark web from nine big forums where CSAM is shared. In total it contains almost 1.5 M posts from the dark web. In order to understand how large the user base of these forums is, according to Web-IQ experts (Web-IQ, 2018) it contains between 300,000 to 1 million people. The large margin is due to the fact that a lot of users register on multiple forums with different usernames. In one particular child abuse forum an average of 2.300 registrations were made per day, from February until November 2018. The language used for communication is predominantly English, followed by Russian, German, Spanish, Portuguese, French, etc. The ages being discussed in these forums are mainly around 12 years old (19%), followed by 13 years old (15%), 14 years old (12%), and 10 years old (9%). The distribution of ages mentioned in forums of the dark web can be seen in Fig. 8.

Apart from exchanging CSAM, one major topic of discussions in the dark web is how to get acquainted with children in the clear web and how to lure them to share personal videos and pictures. This is done mainly through chatting, online games, and platforms where children upload videos and pictures, or broadcast themselves live. The results of these actions and any material obtained are subsequently shared on the dark web forums. As a result, many child videos become the subject of sexualized discussions.

In (Web-IQ, 2018), a sample of just over 2.000 posts were analyzed containing discussions on how and where to connect with children, sharing of web cam captures and other material found on the clear web. In all posts there is mention to the age. Then, the age of the subject and platform name were extracted. According to the study (Web-IQ, 2018) "the most mentioned platforms in the context of connecting with minors or for finding self-produced material are social media platforms. Omegle (Omegle, 2019), a website that matches two strangers to video chat, is mentioned most often. Skype (Skype, 2019), where users can also chat and video chat is second. YouTube (YouTube, 2019) is mentioned most often by users sharing videos of children. YouTube, contrary to Omegle and Skype, is not used for one-to-one communication. Games and gaming consoles are used to connect with minors. Xbox (Xbox, 2019) is most often mentioned, followed by PlayStation (PlayStation, 2018) and the game Minecraft (Minecraft, 2019). In general discussions, outside the scope of this analysis, these platforms are mentioned a lot more often. There appear to be a number of avid gamers among the CSAM forum members".

Another topic of discussion in the CSAM forums is how one can cover his identity in order to keep secure and not to be exposed. There are discussions about the dos and don'ts when it comes to uploading files. In one particular post a user is informing the forum about which file host to use and which one not to use (e.g. because it uses JavaScript, or because it's running antivirus systems, or requires an account to use it, etc.).

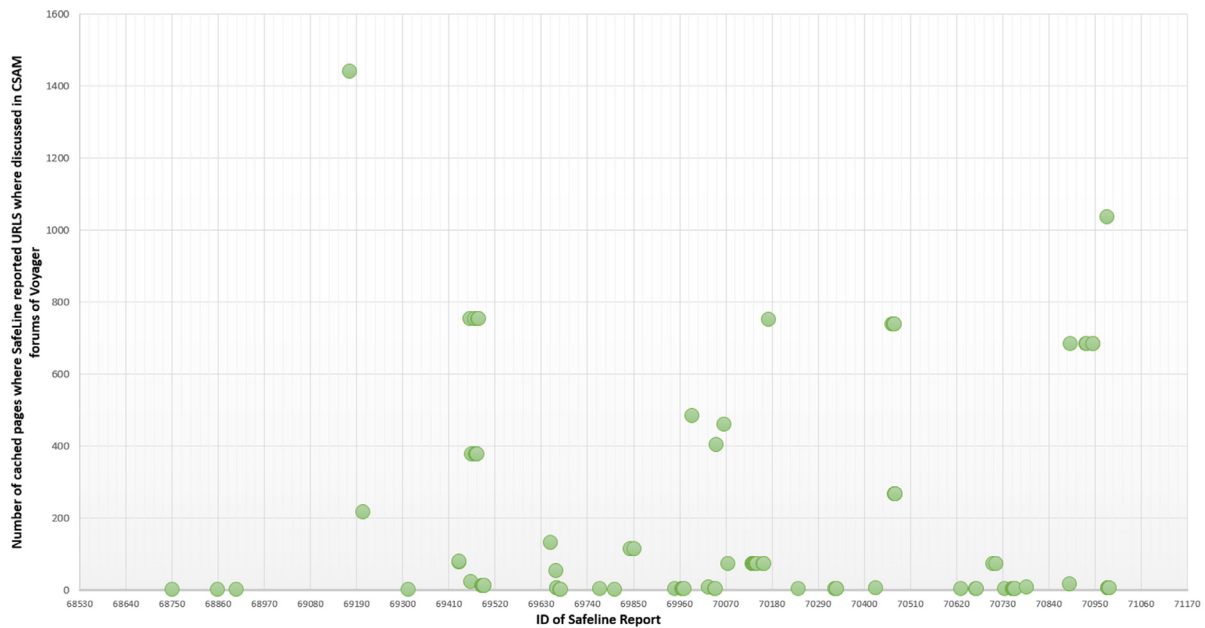


Fig. 7. – Correlation of SafeLine's reports and domain mentions in dark web.

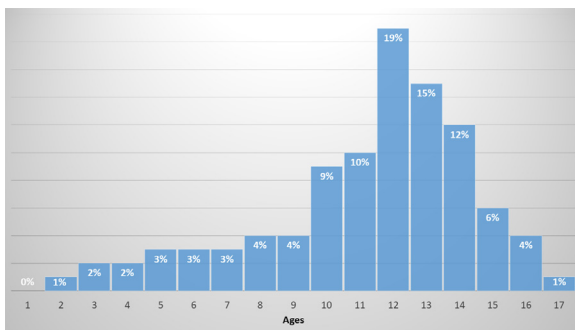


Fig. 8. – Mention of ages in dark web forums.

3.3. Correlating SafeLine's reports to mentions in the dark web

We analyzed approximately 200 reports received by SafeLine from 10/5/2018 to 10/12/2018, that contain CSAM and we have correlated them with the ATLAS database of Voyager system, to determine if the reported sites/domains are discussed in the dark web. It should be noted that SafeLine receives reports about online material that is hosted only in the clear net, and not in the dark web. By doing so we wanted to determine if the content reported to SafeLine as CSAM contained in the clear net, is indeed a subject of discussions in the dark web and the extend of these discussions. To the best of our knowledge, there is no other scientific work that correlates information in the clear net and the dark web.

From our analysis, we concluded that 50% of the domains reported to SafeLine containing CSAM material, are mentioned in discussions of the CSAM forums. Each of these domains has been discussed from several times up to thousand times in the cached pages of Voyager. Fig. 7 shows the IDs of

the SafeLine's reports that have been correlated to posts from the dark web, and the extent to which they are mentioned in the forums (number of cached pages in the Voyager system). This figure reveals the extent to which the material that is contained in normal web are discussed in the dark web. Thus, it is a proof that the dark web and the normal web are closely related.

The analysis also reveals that a lot of illegal CSAM material that is shared in the dark web is hosted in password protected clear web sites. These passwords are then shared in the dark net. As a consequence, the belief that illegal material is mainly exchanged in the dark web is not true. Our study revealed that this material is also uploaded in the normal web, with the intention of sharing it in the dark web. Developing technological solutions to assist in the elimination of such material from the web is of primary importance.

Lastly, from our analysis we conclude that the Greek language is used very little, if at all, in the discussions of CSAM forums. Only one such webpage that is in the registry of Greek domain names (.gr) is mentioned in the forums, and for this one, SafeLine has already filed a report to the Cyber Crime Division of the Greek Police.

4. Legislative CSAM framework for country members of INHOPE

The term "Child Sexual Abuse Material" defines any image or depiction that portrays a child engaging in sexual activity, appearing as being engaged or forced to sexual activity, or a child the genitalia of which are depicted on an item for primarily sexual purpose. The term "Child Sexual Abuse Material" is being used more frequently as more appropriate than the term "Child Pornography" (Franqueira et al., 2017), since porn is a notion mostly used for adults' consensual sexual acts, which

Table 1. – References to national legislations for age threshold for sexual consent for EU-country members of INHOPE.

Austria (Criminal Code of the Republic of Austria, section 206, 74)
Belgium (Criminal Code of the Kingdom of Belgium, article 372)
Croatia (Criminal Code of the Republic of Croatia, article 158)
Czech Republic (Criminal Code of the Czech Republic, section 187)
Denmark (Criminal Code of Denmark, Chapter 24 § 222)
Estonia (Criminal Code of the Republic of Estonia Division 7 § 145)
Finland (Criminal Code of Finland, Chapter 20, section 6(1))
France (Criminal Code of the French Republic article 227–25)
Germany (Criminal Code of the Federal Republic of Germany, section 176)
Greece (Greek Penal Code, article 339)
Hungary (Criminal Code of the Republic of Hungary section 198, Act No. C of 2012)
Ireland (Criminal Law (Sexual Offences) Act 2017, section17)
Italy (Penal Code of Italy article 609quater)
Latvia (Criminal Law of the Republic of Latvia, section 161)
Lithuania (Criminal Code of Lithuania, article 151.1)
Luxembourg (Criminal Code of the Grand-Duchy of Luxembourg, article 372)
Malta (Gender-Based Violence and Domestic Violence, Act 2018, article 203)
The Netherlands (Criminal Code of the Kingdom of Netherlands Part XIV, section 245, 247)
Poland (Criminal Code of the Republic of Poland article 200 § 1)
Portugal (Portuguese Criminal Code, article 171)
Romania (Criminal Code of Republic of Romania, Chapter VII, article 220(1))
Slovenia (Criminal Code of Republic of Slovenia, article 173)
Sweden (Criminal Code of the Kingdom of Sweden, Chapter 6, Section 4)
UK (“Sexual Offences Act 2003, section 9”, “The Sexual Offences (Northern Ireland) Order 2008 Part 3 section 16”, “Sexual Offences (Scotland) Act 2009 section 29, 30, 31)

usually are legally disseminated. Using the term “porn” in order to describe this crime reduces the seriousness of the act, where children without being able to give their consent are victims. Nonetheless, some legislations still use the term child pornography.

Child Pornography is a crime with different legal definitions in each country. The European directive 2011/92/EU of 13 December 2011 aimed at the harmonization of criminal offences related to child sexual abuse, sexual exploitation of children and child pornography across the European Union ([Directive_EU, 2011](#)). In accordance with this Directive, custodial sentences at national level must cover at least certain limits depending on the severity of the crime. Notwithstanding that the age threshold under which a child is illegally appearing in sexual abuse material is agreed to be 18 years almost everywhere in European Union, the age of sexual consent under which the sexual intercourse constitutes a crime still varies ([Figure 11](#); [Table 1](#)). In practice, such differentiations usually encourage offenders to travel to countries with lower limits of sexual consent and thus escape prosecution for the crime of child molestation in their own country.

Under this study, only the maximum penalty limits of CSAM (Child Sexual Abuse Material) offences are listed, without taking under consideration any fines prescribed, any ag-

Table 2. – References to national legislations for age threshold for sexual consent for non-EU country members of INHOPE.

Australia (Criminal Code Act 1995, Division 272)
Note: Under the federal legislation that is applicable to all Australians, it is illegal for an Australian citizen while outside of Australia to have a sexual intercourse with a person under the age of 16. Each State of the Federation has its own regulations about the age of consent. In most of the States and Territories the age of consent is 16 years, and only in two States the age of consent is 17 years.
Bosnia and Herzegovina (Criminal Code of the Federation of Bosnia and Herzegovina, articles 2, 207)
Brazil (Brazilian Penal Code, article 217-A)
Canada (Criminal Code of Canada, section 151)
Colombia (Criminal Code of Colombia, article 208)
Iceland (Icelandic Penal Code, article 202)
Japan (Penal Code of Japan, article 176)
New Zealand (Crimes Act 1961, article 134)
Russia (Criminal Code of the Russian Federation, article 134)
South Africa (Criminal Law (Sexual Offences and related Matters) Chapter 3, section 15 and 16, Chapter 1, 1)
South Korea (Criminal Act of the Republic of Korea, article 305)
Taiwan (Criminal Code of the Republic of China, article 227)
Turkey (Turkish Criminal Code article 104)
USA – 16 to 18 depending on State

Note: In the United States of America, laws on the age of sexual consent are different depending on each and every State. Thereafter, the age of consent ranges from 16 to 18 years of age accordingly to each State's laws.

gravating circumstances or any elements beyond the essential components of the crime itself, which increase the guilt of the offender and thus carry harsher penalties. At the same time, any comparison concerning countries' different legislations is made on the basis of the maximum penalties provided by each legislation. Additionally, it should be noted that the following information result from the study on penal codes' articles which form the constituent elements of CSAM crimes and not the articles providing for the offense of pornographic performances of minors. Moreover, the following analysis will examine legal approaches solely on the crime of simple possession, with no reference to the crime of possession with the intent to commit other CSAM crimes, which is criminalized under some legislations. In any case where CSAM crimes carry harsher penalties under some legislations, when committed through the use of technology, those sentences will be listed as the maximum ones in the following analysis. Consequently, in case where committing a CSAM crime through the use of technology constitutes an aggravating circumstance under some legislations, the correspondent maximum penalty limit will be the only case of a harsher penalty resulting from an aggravating circumstance that will be included in the following analysis. At the same time, it should be noted that in cases where national legislations prescribe harsher penalties for CSAM crimes when the victim has not attained a certain age threshold([Figs. 11 and 12](#); [Tables 1 and 2](#)), the relevant penalty will not be taken under consideration in order for the maximum penalty limits to be listed ([Figs. 9 and 10](#)). On the contrary, only the penalties resulting from the basic forms of

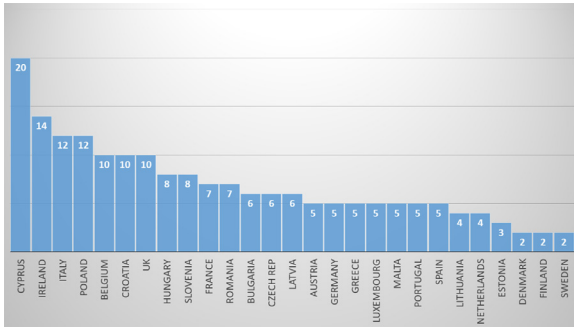


Fig. 9. – CSAM penalties in EU-country members of INHOPE.

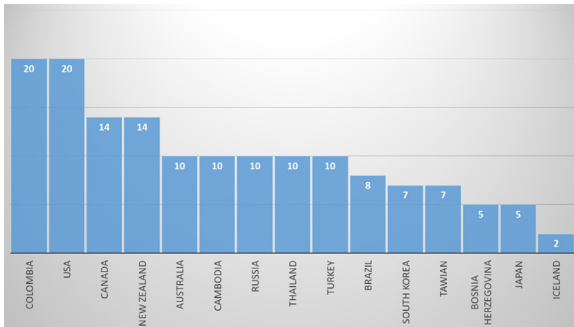


Fig. 10. – CSAM penalties in non-EU country members of INHOPE.

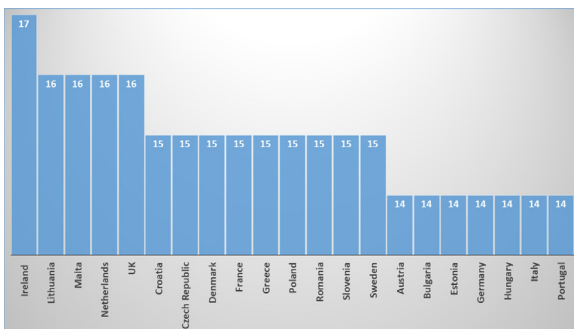


Fig. 11. – Age of consent in EU-country members of INHOPE.

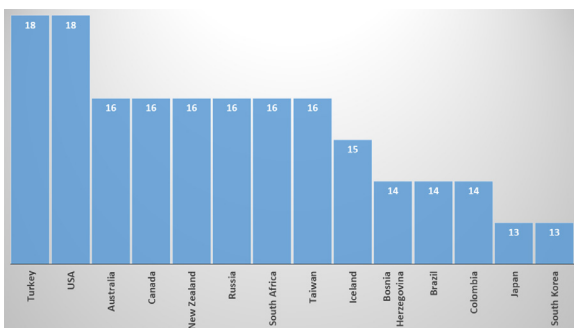


Fig. 12. – Age of consent in non-EU country members of INHOPE.

CSAM crimes¹ will be referred in the analysis. Concerning the crime of acquiring access to CSAM, one sole and distinct paragraph will be dedicated to the matter.

In this legislative analysis the problem of different child pornography legislations that complicates the efficient battle against CSAM is underlined and the existing variations on penalty limits for CSAM crimes across countries members of INHOPE are mainly analyzed. At the same time, the INHOPE's contribution to the rapid and effective combat of online child pornography is highlighted, as a response to the challenge generated by the different legislations on the matter.

4.1. EU-country members of INHOPE

Concerning the penalties of imprisonment prescribed by countries in European Union for the crime of child pornography, some countries provide for the same penalties for all the offences of child pornography, while others are making legislative differentiations depending on each particular act. For example, in some countries production, dissemination, transport, possession, publication or sell of child sexual abuse material are punishable by the same penalties, whereas in other countries possession and accessing child sexual abuse material are punished by lower penalties. At the same time, the definition of the crime of possession of child sexual abuse material varies from country to country.

The most lenient penalties of imprisonment prescribed for most of the CSAM offences, excluding the crime of possession and without taking under consideration any aggravating circumstances, are provided by Denmark, Finland and Sweden. Those three legislations provide penalties for up to 2 years for the offenders (Denmark, 2019; Finland, 2015; Finland_a, 2015; Sweden, 2020). Equally, lenient penalties are provided by Estonia where the penalty of imprisonment can reach up to 3 years (Estonia, 2019). Under the law of the Netherlands, the offenders are subject to not really tough sentences of imprisonment which can reach up to 4 years, while the same penalty is provided under the legislation of Lithuania (Netherlands, 2014; Lithuania, 2017). Stricter penalties for most of the offences of child pornography are provided by the laws of Austria, Germany, Greece, Luxembourg, Malta, Portugal and Spain where custodial sentences can reach up to 5 years (Austria, 2019; German, 2019; Greece, 2019; Luxembourg, 2018; Malta, 2019; Portugal, 2019; Spain, 2019). In France and Romania imprisonment can reach up to 7 years, while in Latvia, Bulgaria and Czech Republic up to 6 years (France, 2020; Romania, 2017; Bulgaria, 2017; Czech, 2019; Latvia, 2018).

In Hungary and Slovenia custodial sentences for most of the CSAM crimes can reach up to 8 years, while stricter penalties are provided by Italy and Poland where imprisonment can reach 12 years (Hungary, 2012; Slovenia, 2012; Italy, 2020; Poland, 2014). Harsh penalties are also prescribed by the Belgium, Croatia and United Kingdom's laws where CSAM of-

¹ Basic forms of CSAM crimes under this study will be considered the ones that contain the minimum constituent elements required in order for the crime to be determined, without taking under consideration any aggravating circumstances or any elements that increase the guilt of the offender and thus carry harsher penalties.

fences are punishable by up to 10 years, while under the Irish law, custodial sentences can reach 14 years (Belgium, 2018; Croatia, 2019; UK, 2015; Irish, 2017). It should be noted though that under the law of Cyprus, the production of child pornography can be punishable by up to 20 years of imprisonment (Cyprus, 2014). Fig. 9 shows the maximum penalties for CSAM in EU countries members of INHOPE without taking under consideration any aggravating circumstances, or any elements that increase the guilt of the offender.

Concerning the crime of simple possession (simple/mere possession is the possession without any intent to commit other CSAM crimes) of child sexual abuse material, among the most lenient legislations are those of Belgium, Bulgaria, Finland and Spain where imprisonment can reach up to 1 year (Belgium, 2018; Finland, 2015; Spain, 2019; Bulgaria, 2017). Quite favorable criminal laws against the crime of simple possession of child sexual abuse material are met under Austrian, French and Swedish criminal provisions where custodial sentences can reach up to 2 years (Austria, 2019; France, 2020; Sweden, 2020). Countries such as Hungary and Luxembourg provide for terms of imprisonment of up to 3 years in case of conviction of mere possession (Hungary, 2012; Luxembourg, 2018).

Under Irish law simple possession of such material can be punishable for up to 5 years of imprisonment (Irish, 2017), whereas simple acquisition of child sexual abuse material under Portuguese law is punishable for up to 2 years of imprisonment (Portugal, 2019). Greece and Poland provide for maximum sentences of up to 5 years of imprisonment in case of simple possession, while under Romanian law, possession through a computer system is punishable for up to 7 years of imprisonment (Greece, 2019; Poland, 2014; Romania, 2017). Under the law of the Netherlands, the crime of simple possession carries a sentence of up to 4 years in case of conviction (Netherlands, 2014). Concerning the law of Cyprus, it is observed that it provides for strict penalties even for the crime of simple possession, where penalties of imprisonment in case of conviction can reach 10 years (Cyprus, 2014). It is worthy to mention that only in a few countries, simple CSAM possession is punishable by the same penalties as the other offences of child pornography which constitute more severe acts. For instance, countries with such legislation are the Netherlands and Greece and such a provision can be criticized while aggravating circumstances that result to more severe custodial sentences are also applicable to simple possession crimes (Greece, 2019; Netherlands, 2014).

Regarding the definition of CSAM possession, it varies considerably within the European Union. Searching for CSAM content online may be punishable under some legislations, while after simply loading a page with illegal content the results are stored in a directory for temporary internet files and such an action may be a crime under some legislations. On the contrary, in other countries, deliberately or knowingly visiting a URL which contains illegal content is not prosecuted due to the fact that only permanent storage on the hard drive constitutes digital possession.

However, despite the differences in the definition of CSAM possession in several legislations, the Lanzarote Convention Explanatory Report (Lanzarote, 2007) provides an interpretation of the term “CSAM possession”, which should be crim-

inalized under the article 20 of the Lanzarote Convention. Specifically, according to the Explanatory Report, CSAM possession can be committed “by whatever means, such as magazines, video cassettes, DVDs or portable phones, including stored in a computer system or on a data carrier, as well as a detachable storage device, a diskette or CD-Rom”.

The European Directive provides also for the criminalization of the access to CSAM material. Article 5 of the Directive states that knowingly accessing child sexual abuse material through means of information and communication technology shall be punishable by a maximum term of imprisonment of at least 1 year (Directive_EU, 2011). An overview of the European legislations proves that according to some countries’ laws, possession and knowingly acquiring access to child sexual abuse material are offences punishable by the same prescribed penalties. This is the case of the legislation of Belgium, Bulgaria, Finland, France, Malta, the Netherlands, Poland, Spain and Cyprus (Cyprus, 2014; Belgium, 2018; Bulgaria, 2017; Finland_b, 2015; France, 2020; Malta, 2019; Netherlands, 2014; Poland, 2014; Spain, 2019). On the contrary, other countries criminalize the access to child sexual abuse material by providing for more lenient penalties than those prescribed for the offenders of mere CSAM possession. One such example is the legislation of Romania (Romania, 2017).

A synopsis of the European legislations discloses that in some countries there have been put in place legislative provisions which impose stricter penalties when the victim is a prepubescent minor or a child who has not reached the age of sexual consent (Figure 11, Table 1). At the same time, offenders committing CSAM crimes through the use of technology are subject to an increased penalty under some countries’ laws.

Another crucial issue on child pornography legislation is whether an actual child has to be displayed in order for the material to be considered as illegal or artificially made-up images can constitute illegal content as well. According to the article 2(c) iv of the European Directive “child pornography definition includes realistic images of a child engaging in sexual conduct or realistic images focusing on the genitalia of a child for primarily sexual purposes” (Directive_EU, 2011). For instance, computer generated material and images such as drawings or paintings, which do not portray a real child but they give the impression that sexual activity with minors is actually taking place are also considered illegal.

At the same time, there is an opinion suggesting that the criminalization of virtual child pornography can lead to restriction of freedom of the expression (Ashcroft, 2002). In this context, Gillespie points out that although the Lanzarote Convention explicitly recognizes the crime of virtual child pornography, it also provides the member states with the opportunity to “opt out of criminalizing the production or possession of such images” (Lanzarote, 2007). This way, according to Gillespie, the fact that the member states are able to avoid the latter criminalization perhaps highlights the discrepancies that exist on the matter of criminalizing virtual child pornography (Gillespie, 2018). With regard to the European Directive, another example of virtual child pornography which is listed as a crime under the article 2(c) iii is the utilization of an adult appearing to be a child in material of such a nature (Directive_EU, 2011).

For combating child sexual abuse images online, the Notice and Takedown Procedure (NTD) is an effective element. The legal basis of this element is the Directive 2000/31/EU on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce) and especially article 14 par. 1 (b) which obliges the Internet Service Providers (ISPs), in case they have knowledge or awareness of hosting illegal internet content, to act expeditiously to remove or to disable access to the information. The NTD procedure is not the same for all countries across Europe. There are significant differences from country to country based on the legal framework of each country.

4.2. Non EU-country members of INHOPE

The penalties provided by INHOPE countries outside European Union for child pornography offences, excepting the crime of possession, and without any aggravating circumstances or elements that increase the guilt, range from strict legislative frameworks to more lenient ones. More specifically, Iceland provides penalties with imprisonment for up to 2 years while on the other hand, using a child in the production of “obscene” material is punishable by deprivation of liberty for up to 10 years under the Turkish law (Iceland, 2015; Turkey, 2016). The aforementioned penalty is provided for the crimes of child pornography by the law of Cambodia and Thailand as well (Cambodia 2008, article 40, 41; Thailand, 2015; Anti-Trafficking in Persons Act, B.E 2551 2008). Despite the fact that every State and Territory of Australia has its own legislation on CSAM crimes, Commonwealth offences can be found when carriage services are used to commit such crimes. Consequently, committing CSAM crimes through the use of a carriage service can be punishable by up to 10 years of imprisonment under the Australian law (Australia, 2006). The aforementioned penalty can be imposed as a custodial sentence for child pornography offences under Russian laws as well (Russian, 2012). A harsh sentence of imprisonment for up to 14 years can be issued under Canadian and New Zealand’s legislation (Films, 2015; Canada, 2019). Under the Japanese law, the offenders of most of the crimes of child pornography may be subject to 5 years of imprisonment, whilst the same penalty may be imposed to offenders under Bosnia and Herzegovina’s legislation (Bosnia-Herzegovina, 2016; Japan, 2014). Under Taiwan’s laws, the standard penalty provided for crimes related to child sexual abuse material can reach up to 7 years of imprisonment (Taiwan, 2018), while publicly exhibiting child pornography under South Korea’s legislation is punishable by imprisonment with prison labor for up to 7 years (South-Korea, 2010).

In Brazil, criminal sentences for the crime of child pornography may reach 8 years, while in Colombia committing offences of child pornography can reach a sentence of imprisonment for up to 20 years (Brazil, 2008; Colombia, 2000). Concerning the legislation of South Africa, it is worthy to mention that under “Films and Publications Act, 65 of 1996”, there are not any explicit penalties prescribed for the crimes of child pornography. Therefore, one can refer to sections 19 and 20 of the Criminal Law, while custodial sentences applicable to child pornography offences are listed in section 276A of the Criminal Procedure Act (South-Africa, 2019).

Lastly, the legislation of United States of America appears to be among the harshest in the world. In United States of America, an offender can be prosecuted under state child pornography laws in addition to federal law (CITIZEN’S, 2020). Federal jurisdiction applies almost always when the internet is used to commit crimes of child pornography. Most of the CSAM offences are punishable by up to 20 years of imprisonment under the United States’ Federal Law, without taking under consideration any prior convictions or any existing aggravating circumstances. In Fig. 10, we can see the maximum penalties for CSAM in non-EU countries members of INHOPE, without taking under consideration any aggravating circumstances, or any elements that increase the guilt of the offender.

Concerning the crime of possession in countries of INHOPE outside European Union, different approaches are observed concerning the severity attributed by each legal system to the relevant crime. In South Korea and in Taiwan simple CSAM possession can lead solely to the imposition of a fine (South-Korea, 2010; Taiwan, 2018). According to the Japanese law, possession of child pornography for the purpose of “satisfying one’s sexual curiosity” is punishable by imprisonment with work for up to 1 year, while under the Icelandic law, offenders of the crime of possession are subject to imprisonment for up to 2 years in case of serious violations (Iceland, 2015; Japan, 2014).

Under the law of the Federation of Bosnia and Herzegovina, the law of Thailand and the Turkish law, a custodial sentence for up to 5 years can be issued to the offenders in case of possession, while under Brazilian law imprisonment can be imposed to the offenders for up to 4 years (Brazil, 2008; Bosnia-Herzegovina, 2016; Thailand, 2015; Turkey, 2016).

According to the law of the Commonwealth of Australia, CSAM possession committed through a carriage service is carrying a sentence for up to 10 years of imprisonment, while the same penalty can be imposed to the CSAM possession offenders under Canada’s and New Zealand’s legislation (Australia, 2006; Films, 2015; Canada, 2019). Simple possession under the United States of America Federal Law can also be punished with a penalty of up to 10 years of imprisonment (CITIZEN’S, 2020). On the contrary, Colombian laws are much more stricter than the aforementioned ones while imprisonment for up to 20 years can be imposed in case of an offender committing the crime of simple CSAM possession (Colombia, 2000). It is worthy to mention that under the Criminal Code of the Russian Federation, mere possession or otherwise said possession for personal use does not constitute a crime, despite the fact that CSAM storage, which constitutes a crime, may consist of the action of actual possession (Russian, 2012). A similar observation has to be made for the law of Cambodia on child pornography, which does not provide any provision that criminalizes mere CSAM possession (Cambodia 2008, article 40, 41).

4.3. Main observations

Following this legal analysis, we could conclude that it serves as an indicator of the variety of the existing CSAM criminal offences, the definitions in different jurisdictions, and the effort of each legal system to hinder the production of child pornog-

raphy by attaching criminal sanctions to each particular act from the production to the possession and even the access to CSAM material. At the same time, this analysis reveals the different perspectives of legislations concerning the severity attributed to diverse child pornography acts by setting various penalty limits.

While internet has no borders and there is an evident lack of harmonized national legislations which leads to difficulty in protecting children against CSAM crimes, INHOPE opposes to a fragmented approach to the matter by implementing INTERPOL's criteria and therefore, by giving the opportunity to classify reported content as internationally illegal (INHOPE 2019b). This way, INHOPE offers a remarkable contribution to the battle against online CSAM, while thanks to the close cooperation between hotlines and the ISPs, illegal content reported to ISPs gets removed at high rates.

At the same time, INHOPE hotlines help that the location of the illegal URL is traced and that the illegal content gets issued to the relevant jurisdiction quickly (Maxim et al., 2016). Of course, the high speed of removal of the illegal content would not be accomplished without INHOPE's engagement in the battle against online CSAM, since any delay in the process of content removal facilitates CSAM proliferation.

Nevertheless, we should not ignore that there are still countries around the world that have not adopted legislation on child pornography crimes (International Center for missing and Exploited Children, 2018). Taking under consideration this element, we consider that the battle against internet child pornography needs a collective and holistic approach. As the UN Special Rapporteur on the sale of children, child prostitution and child pornography had mentioned, "this legal vacuum leaves a dangerous gap that exposes children to the risk of abuse, further increased by the impunity factor" (Council, E. a. 2004).

On the other side, there are countries which have taken legislative steps in order to tackle child pornography, but their initiatives on the matter have been proven insufficient to reach an effective response to the phenomenon (Department of Children, 2018). Consequently, it is apparent that although INHOPE's efforts for global network expansion are invaluable (INHOPE, 2019), the problem will continue being growing and the response to it will remain fragmented, if there won't be an effort to harmonize legislations and policy frameworks at an international level.

5. Conclusions

In this paper, we have presented SafeLine as an integral part of the Greek Safer Internet Center, and valuable member of INHOPE, the International Association of Internet Hotlines. The mission and main objectives of the national Hotline but also the international network of Hotlines are analyzed. This global partnership of INHOPE is discussed as a crucial network in the combat of illegal content online, and especially CSAM material, since the internet does not obey to national borders, laws and limitations.

Furthermore, the reports that have been received by SafeLine since the beginning of its operation in 2003 are analysed and compared against INHOPE global statistics, from all national Hotlines. The outcome of the statistical analysis con-

ducted, shows that most reports received by SafeLine during its seventeen years of operation relate to violations of personal data and communications, followed by reports for CSAM. It also shows that the reported cases of CSAM record a steady upward trend throughout SafeLine's 17-year course at an overall average annual increase rate of about 14%. Regarding INHOPE network, it is reported that only during 2018, 337.588 child abuse images and videos were removed from the internet, due to the networks actions, which shows the big impact of the network.

Subsequently, the dark web is explored through the ATLAS dataset of the Voyager systems and CSAM reports received by SafeLine are correlated to discussions and mentions of the dark web dataset. The analysis shows a correlation of more than 50%, identifying domains with thousands of mentions in the dark net CSAM forums, revealing the close connection of content from the dark and clear web.

Finally, the CSAM legislative framework in all countries possessing national hotlines, members of INHOPE is analyzed and significant conclusions are drawn for the global situation in terms of similarities and differences in the legislative frameworks of the 43 different countries, with national INHOPE Hotlines, spanning six different continents. The analysis reveals the evident lack of harmonized national legislations and policy frameworks at international level, and the need for a holistic approach to tackle the problem, demonstrating simultaneously the remarkable contribution offered by INHOPE to the battle against online CSAM.

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