# THE IMPACT OF WCAG 2.0 SPECIFICATIONS ON THE LEVEL OF ACCESSIBILITY OF PUBLIC SOCIAL ASSISTANCE AND CHILD PROTECTION WEBSITES IN ROMANIA

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**ABSTRACT**
*We all notice that the web today plays a fundamental role in almost all important areas of life: from education and finding a job to e-government services. On these conditions, an accessible website that allows all users, including people with disabilities, to participate actively in society, is essential to ensure equal opportunities. The article has focused on identifying the impact they have by the rules and specifications of WCAG 2.0 on accessibility level of government web sites of the Romanian public administration. The analysis and evaluation method chosen fall into the category of computer assisted inspections of the web accessibility. Total Validator Tool 8.7.0 was used and the sample consists of 37 websites representing the general directorates of social assistance and child protection in Romania. The results have showed that most evaluated sites contain accessibility barriers that make the access of disabled people to the content near impossible.*

**KEYWORDS:** *web accesibility, disability, digital information, public administration*

**JEL CLASSIFICATION:** *D 83, M 15, H 83*

## 1. INTRODUCTION

The fact that the Internet today plays a fundamental role in the life of any citizen in the territory of the European Union (EU) has become almost a truism. Through it we can have access from banking, commercial and e-government services, to news or entertainment or recreational activities. Unfortunately there are certain categories of people for which the Internet is about to become an obstacle to access the information or services it offers on web pages. According to data provided by the European Commission (EC), for one in six EU citizens accessing a web page and its content it represents a big problem. Nearly 80 million people with disabilities – their degree of disability varying from mild to severe – may have difficulty if the website does not have an acceptable level of accessibility.

In short, the term "web accessibility" usually refers to making websites accessible to all users (Lujan-Mora, 2013). In these conditions, full participation in society and the total elimination of discrimination of people with disabilities – visual, auditory, cognitive, mental, or physical – is a great challenge for those who develop web pages.

In the international context the most important voice of web accessibility is the voice of the United Nations (UN) – through the *Convention on the Rights of Persons with Disabilities* from 2006. The Convention was signed by all EU member states, which are now required to provide the framework through which persons with disabilities fully exercise their rights in terms of equality – including universal access to web content. Furthermore, to enforce the measures of elimination of any barriers

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that limit the participation of all citizens in social and economic life, EC adopted in 2010 a comprehensive strategy of a Europe without barriers for people with disabilities – *European Disability Strategy 2010-2020*. The action is part of the *Europe 2020* strategy, and one of her main areas of action is accessibility. In this regard, the disabled people should have access to goods, services and assistance devices. It should also be ensured their access to transport, infrastructure and information and communication technologies in the same fashion as for those who are able.
In Romania, the number of disabled people provided by the Ministry of Labour, Family Social Protection and the Elderly (MMFPSPV) on September 30, 2014 was 737,785, i.e. a rate of nearly 3.5% of the total population of the country. For this social category of people, web accessibility is guaranteed by *Law 448/06.12.2006 on the protection and promotion of rights of persons with disabilities*, and also is one of the important directions of the *National Strategy on Social Inclusion of Persons with Disabilities 2014-2020.*
Although there are several regulations and instruments, both at European and national level, recent studies show low levels of web accessibility in terms of government websites in Romania. Since the nature of a public service is non-discrimination and non-rivalry (Plumb et. al., 2003), the present work aims to analyze and evaluate web accessibility for a total of 37 government sites representing the general directorates of social care and child protection in Romania. The research method fall into the category of computer-aided inspections and the instrument used was Total Validator v8.7.0, enabling web accessibility evaluation in relation to WCAG1, WCAG2.0 or US Section 508. Web sites rating was made in relation to WCAG2.0 recommendations, compliance level A – the lowest, but they were counted all identified errors, including the content problems and other compliance level errors – medium AA and higher AAA.

## 2. LITERATURE REVIEW

Web accessibility is a normal consequence of two of the main fundamental human rights – equality and non-discrimination. According to the World Wide Web Consortium (W3C), the concept involves that all users must have access to the content of a website. Another definition, more general, is that web accessibility is the practice of creating websites, developed and edited in a fair manner, able to allow equal access to information for all people (Hillera et al., 2013). Typically, web accessibility benefits people who have a certain degree of disability – visual, auditory, cognitive, mental etc. However there are researchers who estimate that web accessibility is a technological innovation able to improve the relationship between an organization and all its parts not only to people with disabilities (Martinez et al., 2012). In their opinion this is because through a high level of web accessibility, the design of the sites will be sufficiently flexible to meet the needs of users regardless of preferences and situations. The same is suggested by Henry et., al. which believe that the facilities created by high levels of web accessibility can be enjoyed by several categories of users (2014). They relate in particular to users who are in an *extreme situation* - the elderly, those who use old technology and people who have low literacy level, or to those using the modern technologies - tablets, smart TVs, smart-phones. Although studies and assessments of the above are worth mentioning, in this paper the center of gravity remains focused only on the requirements and needs of persons with disabilities regarding their independent and full participation in society.
Web accessibility regulations are specific and vary from one country to another. However, there are several compliance guides that include technical content specifications, agreed unanimously by EU member states. Since 2008 Web Content Accessibility Guidelines (WCAG 2.0) is recognized as the standard for compliance and developers of websites covering a wide range of recommendations to make web content more accessible for people with disabilities but also for users in general. WCAG 2.0 is recognized and accepted not only within the EU but also by most countries in the world. The guide includes four principles that emphasize: *perceptibility, operability, comprehensiveness* and

*robustness*. For a website to be qualified as accessible it must include these 4 principles and to meet a number of specifications included in WCAG 2.0. By applying and respecting these criteria, websites are ranked as follows: A – minimum level of compliance; AA – medium level of compliance; and AAA – high level of compliance.

In EU, at member state level, there are many representative studies that measured the accessibility of government websites, but there are not many comparative studies that rank countries with high or low level of web accessibility. Of the research that have as topic the web accessibility we mention the comparative studies conducted in 2013 report by a panel of experts in collaboration with the Directorate for Communication and Technology Network of the European Commission. The basic goal was to take into account the accessibility web of the EU27 countries and some third party countries. In *Study on assessing and promoting e-accessibility* they estimated that only a third of the public websites content is accessible in Europe.

Sergio Lujan-Mora in 2013 published the results of a comparative study of web accessibility in EU member states. Three public sites from each country have been analyzed – the government's official website, the official website of the Parliament – Upper House and Lower House. The results show that countries like Netherlands, Germany or UK achieved favorable scores, while countries such as Cyprus, Bulgaria and Latvia have their web accessibility rather low.

Other relevant studies about web accessibility published abroad that have targeted government websites are those made by Cullen et al. (2010), Kuzma (2010), Nietzio et al., (2010). In all cases the results show low levels of accessibility and lack of alternative text for non-text content is one of the most common errors identified.

In Romania, MMFPSPV estimated that a rate of nearly 3.5% of the total population of the country is suffering from a functional deficiency whose grade varies from mild to severe. Therefore, public institutions should ensure that all people – including disabled people – are able to equally access their websites. The regulation is contained in *Law 448/2006 on the protection and promotion of rights of persons with disabilities*. In this way, the state recognizes and promotes the access of disabled people to information and electronic communications. Although there are specific laws, rules and recommendations of the EU, recent longitudinal studies show a low level of web accessibility (Pribeanu et al., 2011; Pribeanu et al., 2012; Marinescu 2012). These results were obtained after verifying the compliance with the WCAG 2.0 recommendations of a representative number of public websites in the country.

## 3. METHODOLOGY

### 3.1 Objectives and hypotheses

The general objective of the present study is to identify the level of web accessibility in concordance with WAG 2.0 for a total of 37 government websites representing public institutions in the field of social protection in Romania. The specific objectives highlights aspects as: (i) identifying the number and the main web accessibility and content errors held by the evaluated sites; (ii) identifying the most relevant issues concerning the WCAG 2.0 compliance level A; and (iii) identifying the frequency level of errors that depends on minimum and maximum number of level A nonconformities. The research hypotheses are formulated in accordance to specific objectives and take into account the following:

Hypothesis 1: the existence of a set of rules and a guideline is sufficient for the level of web accessibility of government websites to be high; and

Hypothesis 2: the score differences between evaluated websites are insignificant because the developers of web pages comply with the technical specifications of the WCAG 2.0.

For validation/non-validation of the research hypotheses there were measured the WCAG 2.0 level A compliance number and the frequency errors. Also, for consistent result it was taken in

consideration the total number of web accessibility and content sites errors – including AA and AAA, medium and higher level of compliance.

### 3.2 Sampling and method of research

The sample consists of 37 websites representing the general directorates of social assistance and child protection in Romania (D.G.A.S.P.C.). Initially, the sample included all the 47 public websites, but after a preliminary inspection 10 of them were removed from the assessment, due to them being under construction or the institutions do not hold an official website at the moment of study.

Accessibility evaluation can be done by different methods, both manually and automatically, using specialized tools. In this paper, the analysis and evaluation method chosen fall into the category of web accessibility inspections assisted by computer. Total Validator 8.7.0 was used, which allows the assessment in accordance to WCAG1, WCAG 2.0 and US Section 508. The assessment was made with the WCAG 2.0 recommendations, compliance level A – lowest grade. Also with Total Validator 8.7.0 there were counted the noncompliance errors of used HTML specifications, the formatting errors – *Parsing*, the *broken links* problems and the WCAG 2.0 AA and AAA level errors - intermediate and high grade of compliance. For the results to have a high level of consistency there were evaluated three web pages for each site - *home page*, *overview page* and *contacts*. The period in which the evaluation was conducted is May, 2015. The period was intentionally chosen to be very short to reduce the risk of websites content being exposed to radical changes.

### 3.3. Results

*3.3.1. First page results*

The first page evaluated was the *Home page*. In Table 1 there were put together all 37 analyzed websites, the type and the number of errors identified. The most common content and web accessibility problems identified were those related to the level A compliance, the HTML specifications used and the broken links. There were identified 1,327 errors of level A accessibility, 5023 errors regarding the used HTML specifications and 229 errors on sending links to another page of the site. In total, the *Home page* had a number of 7378 cumulative errors, including problems caused by specifications and formatting – Parsing – and nonconformities to level AA and AAA web accessibility. Best score obtained D.G.A.S.P.C. Sector 2 Bucharest – with a total of 8 errors identified, while at the opposite side was D.G.A.S.P.C. Iasi with 3234 errors. In the first page assessed the average number of errors found was 199.4, suggesting little interest to web developers regarding the accessibility of home pages.

**Table 1. Websites by the number of accessibility and content errors for 1st page**

| D.G.A.S.P.C. | Number of WCAG 2.0 errors regarding level A compliance | Number of LINK errors | Number of HTML errors | Total number of errors |
|---|---|---|---|---|
| Alba | 37 | 1 | 43 | 97 |
| Arad | 1 | 17 | 1 | 19 |
| Bihor | 10 | 2 | 82 | 102 |
| Brasov | 6 | 1 | 5 | 12 |
| Botosani | 24 | 1 | 11 | 54 |

| | | | | |
|---|---|---|---|---|
| Braila | 15 | 0 | 2 | 18 |
| Bacau | 9 | 2 | 1 | 12 |
| Buzau | 13 | 2 | 16 | 32 |
| Covasna | 9 | 5 | 2 | 16 |
| Caras Severin | 33 | 2 | 25 | 61 |
| Constanta | 22 | 5 | 54 | 95 |
| Dolj | 9 | 74 | 5 | 88 |
| Dambovita | 49 | 10 | 46 | 140 |
| Gorj | 32 | 2 | 129 | 192 |
| Galati | 41 | 6 | 81 | 131 |
| Hunedoara | 16 | 2 | 20 | 40 |
| Harghita | 16 | 2 | 6 | 24 |
| Ialomita | 25 | 20 | 28 | 73 |
| Ilfov | 117 | 7 | 238 | 450 |
| Iasi | 280 | 4 | 2751 | 3234 |
| Mehedinti | 2 | 3 | 15 | 20 |
| Maramures | 26 | 12 | 3 | 41 |
| Mures | 24 | 8 | 48 | 83 |
| Olt | 30 | 4 | 155 | 366 |
| Prahova | 3 | 3 | 20 | 28 |
| Satu Mare | 108 | 2 | 51 | 164 |
| Suceava | 1 | 0 | 10 | 11 |
| Sibiu | 49 | 0 | 47 | 170 |
| Teleorman | 54 | 14 | 133 | 201 |
| Timis | 15 | 0 | 20 | 37 |
| Vrancea | 12 | 8 | 60 | 82 |
| Vaslui | 11 | 1 | 24 | 39 |
| Bucharest S1 | 79 | 0 | 315 | 400 |
| Bucharest S2 | 3 | 0 | 3 | 8 |
| Bucharest S3 | 11 | 8 | 10 | 29 |
| Bucharest S4 | 116 | 0 | 537 | 752 |
| Bucharest S6 | 19 | 1 | 26 | 57 |

* The total number also contains other types of identified errors, including those of Parsing , WCAG 2.0 AA and AAA level of compliance.

Table 1.1 shows in particular the situation of websites in terms of level A WCAG 2.0 conformity assessment. As seen, only 10 sites (27.03%) contained on the first page 10 or less errors, more than half of the pages (56.7%) were between 11 and 50 errors, while in 6 cases (16.2%) were identified more than 50 errors. The fact that all 37 sites evaluated contained at least one WCAG 2.0 Level A error, represents a signal of concern about the accessibility of the *Home* web page. The average number of identified errors was 35.8, with a minimum of 1 for D.G.A.S.P.C. Arad and D.G.A.SP.C. Suceava, and a maximum of 280 for D.G.A.S.P.C. Iasi. The most frequent level A errors of web accessibility compliance in the content of the page are the lack of alternative text for non-content and the use of tags for visual presentation.

**Table 1.1. Websites by the number of level A compliance errors for the 1st page**

| Web accessibility score | Number of websites | Percentage | WCAG 2.0 Level A compliance error | Minimum 1 |
|---|---|---|---|---|
| 0 errors | 0 | 0% | | |
| 1-10 errors | 10 | 27,03% | | Maximum 280 |
| 11-20 errors | 9 | 24,32% | | |
| 21-50 errors | 12 | 32,43% | | |
| 51-100 errors | 2 | 5,41% | | Average 35,8 |
| More than100 errors | 4 | 10,81% | | |
| Total | 37 | 100% | | |

The frequency results of WCAG 2.0 level A accessibility errors are shown in Figure 1, where it can be seen that there is considerable variation in test scores obtained by the first page. It can be noticed that the number of errors identified is visibly influenced in a negative way by a number of 6 website, which together adds up more than half – 56.81% –of the total number of nonconformities. As shown, the scores range from 1 to 280, suggesting that web developers either have sufficient knowledge and comply with the WCAG 2.0 technical specifications, or have partial to no knowledge of accessibility recommendations.

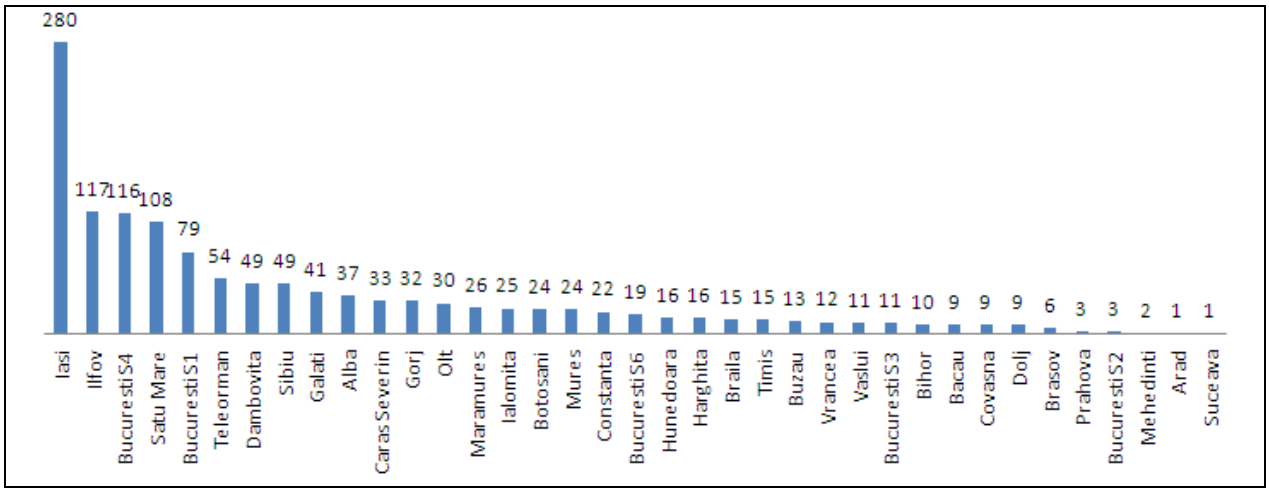


**Figure 1. Frequency of level A compliance errors for the Home page**
*Source*: authors

*3.3.2. Second page results*

Table 2 illustrates the situation of websites by number and type of errors made in the content of the second page evaluated – the overview of the institution. It further shows the large number of HTML errors, which represents more than half of all nonconformities identified (52.45%) with an average of 83.5 on the site. This suggests, as in the first page case, a low interest of web developers to comply with the HTML specifications. The lowest number of errors is in the *broken links* category, with a total of 173 and an average of 4.6 per site, while the problems caused by WCAG 2.0 Level A nonconformities accumulated a total of 1808. In total the second web page evaluated accumulated a number of 5891 errors, of which (86.08%) are associated with categories like HTML, *broken links* and according to WCAG 2.0 level A. Other errors (13.92%) emphasizes the problems caused by format – *Parsing* – and level AA and AAA compliance.

**Table 2. Websites by the number of accessibility and content errors for the 2nd page**

| D.G.A.S.P.C. | Number of WCAG 2.0 errors regarding level A compliance | Number of broken links errors | Number of HTML errors | Total of errors |
|---|---|---|---|---|
| Alba | 35 | 10 | 34 | 95 |
| Arad | 7 | 14 | 0 | 21 |
| Bihor | 10 | 2 | 82 | 144 |
| Brasov | 6 | 1 | 5 | 12 |
| Botosani | 19 | 1 | 11 | 42 |
| Braila | 15 | 0 | 2 | 18 |
| Bacau | 7 | 1 | 1 | 9 |
| Buzau | 10 | 3 | 16 | 30 |
| Covasna | 2 | 3 | 2 | 7 |
| Caras Severin | 22 | 1 | 259 | 502 |
| Constanta | 21 | 4 | 65 | 104 |
| Dolj | 10 | 78 | 4 | 92 |
| Dambovita | 15 | 10 | 36 | 94 |
| Gorj | 32 | 2 | 129 | 192 |
| Galati | 160 | 2 | 222 | 433 |
| Hunedoara | 65 | 2 | 239 | 325 |
| Harghita | 14 | 2 | 3 | 19 |
| Ialomita | 5 | 0 | 6 | 11 |
| Ilfov | 117 | 7 | 238 | 450 |
| Iasi | 25 | 2 | 8 | 48 |
| Mehedinti | 2 | 3 | 15 | 20 |
| Maramures | 17 | 1 | 2 | 20 |
| Mures | 6 | 0 | 39 | 50 |
| Olt | 105 | 4 | 254 | 527 |
| Prahova | 3 | 0 | 9 | 12 |
| Satu Maru | 791 | 1 | 394 | 1196 |
| Suceava | 1 | 0 | 9 | 10 |
| Sibiu | 6 | 0 | 51 | 92 |
| Teleorman | 44 | 9 | 85 | 138 |
| Timis | 7 | 5 | 11 | 25 |
| Vrancea | 14 | 0 | 68 | 84 |
| Vaslui | 15 | 1 | 36 | 53 |
| Bucharest S1 | 85 | 2 | 315 | 403 |
| Bucharest S2 | 3 | 0 | 3 | 8 |
| Bucharest S3 | 4 | 0 | 2 | 6 |
| Bucharest S4 | 92 | 1 | 390 | 527 |
| Bucharest S6 | 16 | 1 | 45 | 72 |

* The total number also contains other types of identified errors, including those of Parsing , WCAG 2.0 AA and AAA level of compliance.

Regarding the number of errors of web accessibility level A, Table 2.1 outlines the results with a total of 1808 non-conformities. Most of the websites (43.24%) contain 10 or less WCAG 2.0 level

A compliance errors. This suggests a considerable improvement of accessibility in the content of the second page, a sign that some developers understand and respects the importance of web page overview of a public institution. More than a third of the websites – 37.84% – accumulated a number of errors between 11 and 50 while the worst scores have been achieved in seven cases (18.92%) with over 50 problems caused by non-compliance. The average number of WCAG 2.0 level A compliance errors is 48.8, with a minimum of 1 for D.G.A.S.P.C. Suceava, and a maximum of 791 for D.G.A.S.P.C. Satu Mare. From the total number of identified errors on the second page most are associated with the lack of alternative text for different figures, tags for visual presentation, different links with the same descriptive text, description table etc.

**Table 2.1. Websites by the number of level A compliance errors for 2nd page**

| **Web accessibility score** | **Number of websites** | **Percentage** | **WCAG 2.0 Level A compliance error** | Minimum 1 |
|---|---|---|---|---|
| 0 errors | 0 | 0% | | |
| 1-10 errors | 16 | 43,24% | | Maximum 791 |
| 11-20 errors | 8 | 21,62% | | |
| 21-50 errors | 6 | 16,22% | | |
| 51-100 errors | 3 | 8,11% | | Average 48,8 |
| More than 100 errors | 4 | 10,81% | | |
| Total | 37 | 100% | | |

Figure 2 shows the frequency of web accessibility level A compliance errors. As it can be seen, in general for the second page, the variation in scores this time is almost insignificant. Approximately 3/4 of the evaluated sites, contains each less than 25 web accessibility level A errors. Given the fact that only two of the sites accumulated together more than half (52.59%) of identified errors, it can be said that scores for the second page evaluated are consistently good. Best score was obtained by D.G.A.S.P.C. Suceava, with one accessibility error, and on the opposite side stands D.G.AS.P.C. Satu Mare with 791 non-compliances.

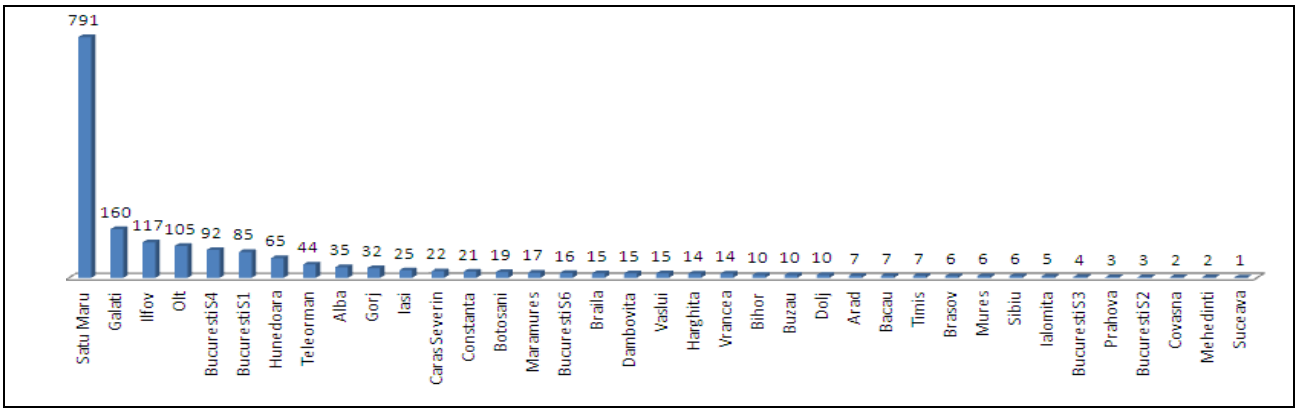


**Figure 2. Frequency of level A compliance errors for the *Overview Page***
*Source*: authors

*3.3.3. Third page results*

Web accessibility evaluation results for the third page – *the Contacts* – are presented in Table 3, where the sites are further grouped according to the number and type of errors identified. As in the case of the first two pages, all websites evaluated contain at least one content or accessibility error. In total there were identified 4881 errors, where website-wide average reached 131.9 – with a minimum of 1 error for D.G.A.S.P.C. Arad and a maximum of 1846 for D.G.A.S.P.C. Sector 4 Bucharest. We see there is a situation improvement regarding the total number of identified errors compared to the first and second page where the total of errors amounted with 2497, respectively 1010 higher values. This is remarkable given the fact that many of the developers are focusing more and more on the home page of the site to create an apparent web accessibility of the entire website.

**Table 3. Websites by the number of accessibility and content errors for the 3rd page**

| D.G.A.S.P.C. | Number of WCAG 2.0 errors regarding level A compliance | Number of broken links errors | Number of HTML errors | Total of errors |
|---|---|---|---|---|
| Alba | 37 | 1 | 43 | 97 |
| Arad | 1 | 0 | 0 | 1 |
| Bihor | 31 | 4 | 131 | 217 |
| Brasov | 5 | 2 | 42 | 49 |
| Botosani | 17 | 0 | 23 | 54 |
| Braila | 18 | 1 | 1 | 23 |
| Bacau | 10 | 14 | 1 | 25 |
| Buzau | 7 | 1 | 1 | 11 |
| Covasna | 15 | 1 | 9 | 25 |
| Caras Severin | 14 | 1 | 3 | 19 |
| Constanta | 25 | 4 | 168 | 212 |
| Dolj | 14 | 79 | 12 | 105 |
| Dambovita | 24 | 9 | 47 | 103 |
| Gorj | 33 | 9 | 170 | 250 |
| Galati | 12 | 3 | 40 | 56 |
| Hunedoara | 16 | 1 | 38 | 57 |
| Harghita | 23 | 4 | 2 | 29 |
| Ialomita | 0 | 0 | 3 | 3 |
| Ilfov | 10 | 2 | 71 | 89 |
| Iasi | 28 | 2 | 22 | 61 |
| Mehedinti | 2 | 1 | 12 | 28 |
| Maramures | 27 | 20 | 2 | 49 |
| Mures | 33 | 0 | 26 | 66 |
| Olt | 30 | 4 | 155 | 366 |
| Prahova | 4 | 1 | 10 | 17 |

| | | | | |
|---|---|---|---|---|
| Satu Mare | 42 | 1 | 8 | 53 |
| Suceava | 5 | 0 | 10 | 15 |
| Sibiu | 11 | 0 | 19 | 56 |
| Teleorman | 99 | 7 | 115 | 221 |
| Timis | 7 | 0 | 17 | 26 |
| Vrancea | 16 | 0 | 39 | 57 |
| Vaslui | 11 | 1 | 28 | 42 |
| Bucharest S1 | 168 | 2 | 315 | 492 |
| Bucharest S2 | 3 | 0 | 3 | 8 |
| Bucharest S3 | 6 | 2 | 5 | 14 |
| Bucharest S4 | 130 | 0 | 1665 | 1846 |
| Bucharest S6 | 10 | 1 | 27 | 39 |

* The total number also contains other types of identified errors, including those of Parsing, WCAG 2.0 AA and AAA level of compliance.

In Table 3.1 is illustrated the score situation obtained from the evaluation of the third web page in compliance with the WCAG 2.0 level A accessibility. In regards to this chapter, this time the results are rather modest, relevant being the fact that only one web site contains 0 level A errors. Almost a third of the sites (32.43%) contain 10 or less errors, in more than half of cases (56.76%) were counted between 11 and 50 errors, while in 3 cases (8.11%) there were identified more than 50 errors. In total, on the third web page, there were noted 944 accessibility level A errors, with a minimum of 0 errors – D.G.A.S.P.C. Ialomita – and a maximum of 168 for D.G.A.S.P.C. Sector 1 Bucharest. The average number of errors is 25.5 and most problems are caused by the tags used for visual presentation and offering alternative texts for various graphs.

**Table 3.1. Websites by the number of level A compliance errors for 3rd page**

| **Web accessibility score** | **Number of websites** | **Percentage** | | |
|---|---|---|---|---|
| 0 errors | 1 | 2,70% | **WCAG 2.0 Level A compliance error** | Minimum 0 |
| 1-10 errors | 12 | 32,43% | | |
| 11-20 errrors | 10 | 27,03% | | |
| 21-50 errors | 11 | 29,73% | | Maximum 168 |
| 51-100 errors | 1 | 2,70% | | |
| More than 100 errors | 2 | 5,41% | | Average 25,5 |
| Total | 37 | 100% | | |

As it can be seen in Figure 3, like in the case of the Start page, the total number of level A errors is significantly influenced in a negative way by a small number of websites. Note that 5 of the 37 sites accumulated 476 errors from a total of 944 non-compliances identified. This means that 13.51% of all sites evaluated contained more than half – 50.42% – of the total number of level A nonconformities. The best scores were obtained by D.G.A.S.P.C. Ialomita, D.G.A.S.P.C. Arad, and D.G.A.S.P.C. Mehedinti, while at the other pole is situated D.G.A.S.P.C. Teleorman, D.G.A.S.P.C. Sector 4 Bucharest and D.G.A.S.P.C. Sector 1 Bucharest. Once again, as with the first page evaluated the considerable variation in the number of identified errors suggest the fact that developers of these websites know the accessibility recommendations partially or do not know at all.

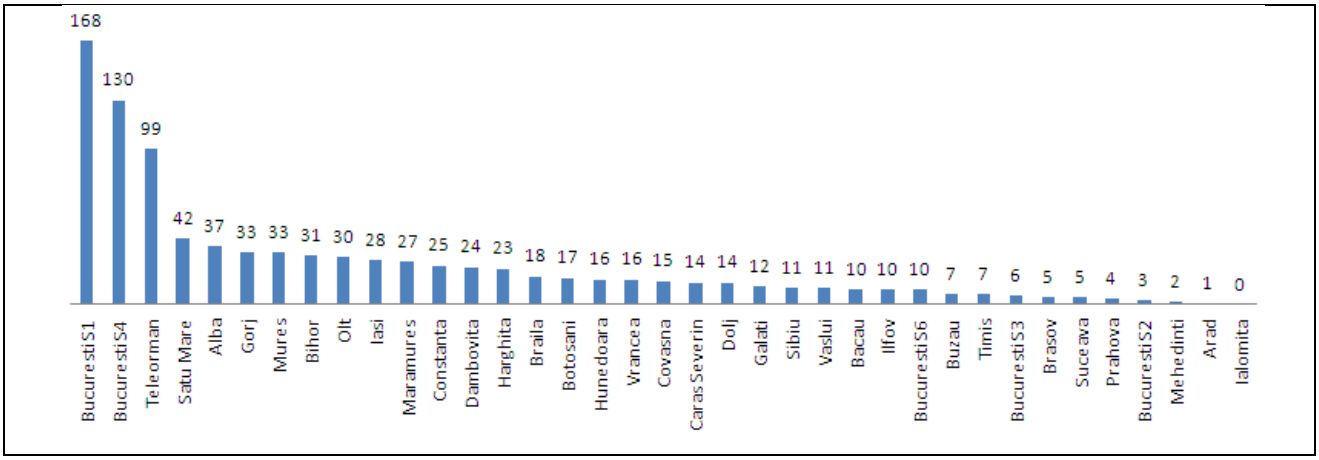


**Figure 3. Frequency of level A compliance errors for the *Contacts Page***
*Source*: authors

*3.3.4. Cumulative results of the three pages evaluated and discussions*

The cumulative scores of web accessibility obtained by the content of the three pages evaluated highlights the following considerations:

- the three web pages evaluated recorded a total of 18,150, containing levels A, AA and AAA web accessibility errors, and non-compliances on HTML, Links and Parsing. The average is situated at 490.5 with a minimum of 1 and a maximum of 3234;
- the total number of nonconformities for the three pages evaluated is assigned as follows: level A errors = 4079; HTML errors = 11396, Broken Links = 580. Formatting errors - Parsing - and WCAG 2.0 AA and AAA errors accumulate a total of 2095. To be noted that the biggest percentage of errors identified were the problems caused by failure of HTML use, with 62.78% of all non-conformities identified;
- the highest number of errors were identified in the content of the first page evaluated, with a total of 7378, while page three - the Contacts - obtained the best score, with a total of 4881 for non-compliance. The second page counted a number of 5891 errors;
- regarding the scores obtained in the evaluation of web accessibility according to WCAG 2.0 level A compliance, the situation stands as follows: it has been counted a total number of 4079 errors where the overall average for each web site is 110.2, with a minimum of 0 and a maximum of 791. Most of the sites - 62.16% - contained between 21 and 100 errors and most non-conformities refers to tags used only for visual presentation and the provision of alternative text for graphics;
- the total number of errors, their average on site and the general situation of the three pages in compliance with WCAG 2.0 Level A specifications show that the level of web

accessibility is rather low. This demonstrates that the first research hypothesis has not been validated. It can be said that WCAG 2.0 standards specifications does not solve the underlying problems of web accessibility of government websites in the field of social and child protection in Romania;

- the frequency of errors accumulated in the three pages evaluated is shown in Figure 4. The results show a very high variation score, which suggests that web developers are aware of the accessibility compliance rules partially or not at all. This does not validates the second research hypothesis according to which web developers know the technical specifications of the WCAG 2.0 accessibility and the scores of web sites do not vary.

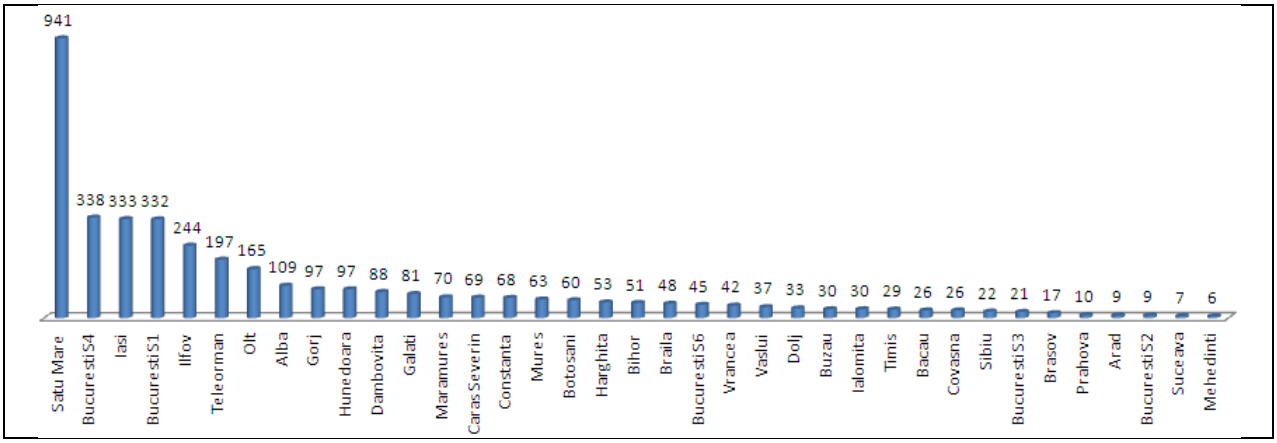


**Figure 4. Frequency of level A compliance errors for the three evaluated pages**
*Source*: authors

## 4. CONCLUSIONS

Currently the European Union and Romanian public authorities committed themselves to ensure that all public web sites are accessible to people with various disabilities. The present study showed that the compliance and the successful fulfillment of the criteria of Web accessibility vary from one institution to another. The results suggest that developers of websites do not have enough knowledge about the importance of web accessibility. Based on the results, their processing and interpretation we suggest a set of specific recommendations aimed at improving the level of accessibility of public web sites of social assistance in Romania and not only:

- common approach, consistent and integrated in terms of design and development of public web sites. Achieving a joint strategy by the 47 directions for social care and child protection in Romania, which includes general and specific goals and deadlines for their fulfillment would greatly facilitate the implementation of the technical specifications of WCAG 2.0;
- control and careful assessment of the institution's internal decision factors on the accessibility of the web site. Creating and implementing an intelligent system of specific indicators can become an effective tool to quantify the level of accessibility of government web sites;
- design and development at the institution level of a specialized service to work with federations, foundations and associations of social protection. This may lead to the realization of the needs analysis of persons with disabilities to implement evidence-based policies and strategies;
- establishment at the central public administration level of a periodic monitoring mechanism regarding the situation of governmental web sites accessibility in Romania.

Public institutions whose web sites had a low level of accessibility can be warned or punished;

- realization within the institution - alongside people with disabilities - of a WCAG conformity assessment of the website every three months. Each institution will create a working group whose objective will be quarterly analysis and evaluation of the Web site accessibility;
- involved in projects / partnerships with successful organizations in the field of digital technology and the continued development of relations with them;
- Identifying the best national and international practices as well as experience exchanges regarding ways to improve the Web accessibility for public web sites - benchmarketing;
- raise the awareness level on the importance of web accessibility issue and the equal opportunities in terms of universal access to web content. Creation at central and local level of public administration of publications, journals or books about research studies and the latest trends in web accessibility.

Although the above list does not totally cover all the possible solutions to improve the level of web accessibility for government websites in Romania, there is the conviction that applying a series of measures suggested, the general situation of web accessibility in the social assistance directorates and child protection in Romania might improve dramatically in a short time.

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