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A STUDY OF GLOBAL HOSPITAL WEBSITES FOR ACCESSIBILITY COMPLIANCE

Dr. Joanne Kuzma*, Joanne Law, Viv Bell, Nicholas Williams
University of Worcester, Worcester, UK
*Corresponding Author

ABSTRACT

The research investigated accessibility problems of 160 hospital websites, located in 16 countries across 4 continents using Tawdis accessibility software tool. Statistics were analyzed from two layers of WCAG guidance, levels A and AAA, revealing a high incidence of problems at both levels. Asian hospital websites had the greatest number of accessibility issues, although the vast majority of sites in all countries had some type of issues. Only two of the hospital websites included in the study were fully Level A compliant. The study concludes that hospitals are not doing an adequate job of complying with accessibility standards or government legislation, thus depriving many of their web customers the ability to fully use the sites.

Keywords: *Accessibility, Disability, Web Content Accessibility Guidelines (WCAG), W3C*

1. Introduction

Hospital websites are an important source of information for patients and stakeholders. Designers must ensure that they are accessible to the widest possible range of people. In order to provide an adequate level of accessibility, site designers should use a variety of methods, including adhering to government legislation and meeting published accessibility guidelines and standards. The **Web Content Accessibility Guidelines** (WCAG) is a set of compliance standards developed in conjunction with individuals, governments and organizations. The guidelines enable designers to check whether their websites meet certain criteria. The lowest level, level A is easy to achieve yet has little impact to the overall design and goes relatively unnoticeable, but the highest-level AAA can be difficult to achieve and may have high impact on the eventual design (**W3C, 2012).** This research analyzed the number of problems found across two levels of compliance, levels A and AAA. 160 worldwide hospital websites located in 16 countries over 4 continents were tested using the accessibility checker Tawdis (T.A.W. Funcdacion CTIC, 2016). The resulting data showed that the lowest level of compliance, level A, revealed the largest number of problems. Three research questions were addressed:

1. How many hospital sites meet minimum WCAG disability guidelines?
2. What are the most common types of accessibility problems?
3. Is there a significant difference in accessibility compliance between regions and countries?

Research into the area of website accessibility has often concentrated on European and American sites, with few studies investigating Africa or Asia. There has been little research into the accessibility of hospital websites, which seems unusual, given the wide diversity of users, and the importance of the information. This study, therefore, contributes a body of knowledge outside of the usual geographical region and topic areas.

1. Literature Review

2.1 Legal Mandates of Web Accessibility

One problem with website accessibility is the myriad of legal mandates throughout the world, with each country having their own specific laws, or none at all. An issue raised by Blanck (2014) is that although various accessibility laws have existed in a variety of countries, the notion of 'web content equality' for people with disabilities has generally received limited attention and even faced resistance and pushback.

Podlas (2015) describes web accessibility law in the U.S. as being only partially covered under the American's with Disabilities Act (ADA) of 1990. The ADA prohibits public employers, governmental entities and privately-owned places of public accommodation from discriminating on the basis is disability. The author explains that some websites fall under the domain of the ADA law, whilst others do not, but independent of legal obligations, it is suggested that it is in the best interest of website operators to cultivate consumer goodwill and business strategy by making sites accessible.

Canadian web accessibility law requires that all government websites meet WCAG 2.0 (Treasury Board of Canada Secretariat, 2011). The Canadian Ontario province has more stringent requirements compared to the national law. From January 2014, new public websites must meet WCAG 2.0 Level A, and beginning January 2021, all must meet Level AA criteria. (Government of Ontario, 2016). Mexico is starting to address issues related to online disability. In December 2015, it was announced that all federal websites would become accessible to individuals with disabilities and would follow WCAG 2.0 guidelines (User1st, 2016).

The Venezuelan government published Resolution 026 of the Official Gazette No. 39,633 in 2011 to provide guidelines for online accessibility for federal entities. However, the guidelines are not clear on whether agencies should meet WCAG 1.0 or 2.0 (Accessibilidad Web, 2016).

Western European nations have tended to enact comprehensive disability laws addressing web accessibility. The UK Equality Act of 2010 was merged into the 1995 Disability Discrimination Act of 1995 and requires website owners to ensure their sites are accessible to users with disabilities. Despite the goal of clarity, the new legislation can be more confusing than the old (Equality Law, 2016). In 2011, Germany BITV 2 (based on WCAG 2.0) came into effect, requiring all federal government websites to comply with guidelines for improving public web accessibility (Reddy, 2014). In Italy, Law 4/2004 (Stanca Act) addresses the need for federal government and public administration sites to be meet WCAG guidelines (Reddy, 2014). In France, Law No. 2005-102, Article 47, requires all French central government websites to have met accessibility guidelines by 20010as updated to take into account new technologies like HTML5 and ARIA (PowerMapper Software, 2016).

National web accessibility laws are weak in most Asian countries (Kuzma, et. al., 2009). In India, WCAG 2.0 Level A became the standard for Indian government websites in 2009 (PowerMapper Software, 2016), with the government publishing "Guidelines for Indian Government Websites" for accessibility compliance (Government of India, 2014). According to Global Initiative for Inclusive Information and Communication Technologies (G3ict, 2016), Thailand does not have specific web accessibility legislation at this time. They have however, developed web accessibility guidelines based on a modified version of WCAG 1.0, intended to be promoted in the public and private sector. Philippine Law (RA7277) “Magna Carta for the Disabled Persons,” prohibits discrimination against disabled persons, but does not specifically address website accessibility (National Council on Disability Affairs, 2012). In July 2013, the Philippine government mandated all line agencies to transfer their Internet hosting requirements to the Government Web Hosting Service (GWHS) for more efficient use of technology. All government agencies are obliged to strictly follow the Uniform Website Content Policy (UWCP) which gives their websites a common look and feel, as well as meeting PWAG web accessibility guidelines (iGov Philippines, 2016).

According to Fu (2011), China does have a series of protection policies for people with disabilities, but development of accessibility is still at the initial stage. At the national level, in 1990 China enacted a comprehensive law to protect people with disabilities – Law of the People’s Republic of China on the Protection of Disabled Persons (LCPDP), and amended this in 2008. However, Fu states that that there are issues with people understanding the policies, lagging legislation and lack of unified standards. The Paceillo Group (2014) indicated that China’s regulations found no direct evidence for a national standard for web accessibility, although working groups have been formed in 2014 to start development of a national standard.

Egypt has no specific law on website accessibility. However, they signed the UN Convention on the Right of Persons with Disabilities in 2007 and ratified the treaty in April 2008, which deals with the recognition of persons with disabilities on an equal basis with others before the law. The National Council on Disability Affairs is responsible for reporting Egypt’s progress in implementing the treaty. However, due to political instability in Egypt since 2011, the government has yet to produce a report on progress (African Disability Rights Yearbook, 2014).

Kenya has a general disability law – the Persons with Disability Act (2003), which was amended in 2011. However, the policies do not sufficiently address the issues of e-accessibility with regards to persons with disabilities, and the concept of web accessibility is missing from national documents and strategies

(Kimanzi, 2012). Al-Khalifa (2012) states that the Saudi Arabian government has put into place legislation regarding general disability issues that address employment and skills development, but do not address specifics related to web accessibility. South Africa does not have a specific law protecting Web accessibility, although the 'Promotion of Equality and Prevention of Unfair Discrimination Act 2000' does address some general aspects social equality (The Paceillo Group, 2014).

2.2 Web Content Standards

Al-Khalifa (2012) states that for those countries that have not established their own legislation regarding Web accessibility, prominent accessibility guidelines have been created by the World Wide Web Consortium (W3C). A consortium of individuals and organizations have developed a set of Web Content Accessibility Guidelines (WCAG) that provide a shared standard for web content accessibility to meet the needs of individuals, organisations and governments (W3C, 2012). However, whilst the guidelines exist, they are not legally binding and research has found that mere publication of the guidelines does not guarantee website accessibility improvements (Richards, et. al., 2012).

The WCAG documents explain how to make web content more accessible to people with disabilities by addressing a variety of applications such as text, images, structure and presentation (W3C, 2012). The original WCAG 1.0 version was published in 1999 with an update standard 2.0 released in 2008 (W3C, 2016f). According to W3C (2008), version 2.0 has four main principles which contain 12 prominent guidelines that serve as basic goals web authors should work towards. The four principles are:

- Principle 1: Perceivable - Information and user interface components must be presentable to users in ways they can perceive
- Principle 2: Operable - User interface components and navigation must be operable.
- Principle 3: Understandable - Information and the operation of user interface must be understandable.
- Principle 4: Robust - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies (W3C, 2008).

Each of the four principles has a series of guidelines that describes the principle in greater detail. For each guideline, testable success criteria are provided to be used in testing, to meet design and regulation requirements. According to W3C (2016d), three levels of priority conformance checkpoints are provided for each of the 12 guidelines:

- Level A – the minimum level of conformance, and web authors are encouraged to go beyond conformance at this level.
- Level AA – The web page satisfies all Level A and AA criteria.
- Level AAA – The web page satisfies Level A, AA and AAA criteria. This is the strictest of the levels and requires not only the web page, but the entire process to conform. For example, a shopping site would only meet the AAA level if the checkout and other shopping features conforms to guidelines.

Table 1 shows the complete WCAG set of principles, guidelines, level and success criteria that web operators should review when designing their pages. Al-Khalifa (2012) indicates the guidelines provide a wide description of accessibility requirements, and published criteria form the basis for testable entities for conformance. Some of the entities can be tested automatically using software evaluation programs, while others require human testing approaches, though all success criteria are written as 'technology neutral.'

2.3 Previous Research

Even if nations do ratify specific accessibility legislation, this in itself is not sufficient to ensure accessibility in real social context (Kemppainen, 2011). Accessibility studies worldwide show a dearth of websites that adhere to W3C accessibility standards or laws in all regions of the world. Kurniawan and Zaphiris (2001) performed a study on aging/health-related web sites with different domain extensions (.com., .edu., .gov, and .org) using the Bobby accessibility tool. Their research found that on average, only 28 percent of health sites were approved with the Bobby tool. This ranged from a low of 18 percent of dot.com sites to 52 percent of (.gov) government health-related sites. The authors reasoned that government websites come under stricter government regulations with the U.S. Section 255 of the Telecommunications Act, to ensure that sites maintained by U.S. Federal agencies are accessible and usable by most people. Another North American study by O'Grady (2005) studied 49 Canadian consumer oriented health care sites, with results indicating only about 40% of pages investigated were free of errors in accordance with WCAG 1.0 Priority 1 level. Zeng and Parmanto (2004) studied 108 general health websites and none of the tested sites, including the most accessible government sites, passed the WCAG guideline priority 1 checkpoints. Additionally, a 2014 study of 2785 U.S. hospitals found their sites lacking accessibility dimension, with an average score of 5.08 out of 10 (Huerta, et. al., 2014).

European hospital websites have not scored well in prior accessibility studies. Llinás (et. al., 2008) performed a descriptive study of 32 hospital portals (12 Spanish, 10 American and 10 British), and found that only 10 of the 32 websites meet the accessibility criteria. Maifredi (et. al., 2010) performed an analysis of all Italian hospitals with working websites, with a wide range of quality, but most had serious limitations. Mira (et. al., 2006) studied websites in Spanish hospitals for readability and accessibility. Their results found that none of the websites visited fulfilled the requirements necessary to be considered as accessible. A recent study of Spanish healthcare institutions found all website were WCAG 2.0 non-compliant (Martins, et. al., 2016). As of the date of this study, no French, German or Italian hospital website studies have been performed. Prior studies of different industries have found none are fully compliant with WCAG (Kuzma, et. al, 2009, McMullin, 2004).

As with the European hospital website research, studies have not been carried out on these sites in Asian countries. However, other closely-related studies can shed light on general accessibility issues in Asian countries. A 2007 study of Thai government websites found that only 3 of 267 passed the test of W3C guidelines on web accessibility (Mitsamarn, et. al., 2007), whilst a 2013 study found no Thai government websites met W3C level 2.0 guidelines (Maisak, 2013). Pei-Luen (et. al., 2014) evaluated 38 popular Chinese websites in 2009 and 50 in 2013 with references to W3C 1.0 guidelines. Results indicated that no website met minimum requirements for accessibility and the average level of web accessibility instead decreased, due to the increase in website complexity and amount of content. A study by Kuzma (et. al., 2009) of 6 Indian and Philippines government sites found that no Indian site met guidelines, while 4 of the 6 in the Philippines did. In 2013, an audit of 10 Indian government websites found that none were accessible (Disability News and Information Service, 2013).

Empirical studies of African and Middle Eastern hospital websites are missing from contemporary research. Studies of general websites in these countries find few sites meet the needs of disabled consumers. A 2012 study of Saudi government sites found many accessibility mistakes (Al-Kahlifa, 2012), and a study of South African websites found only 20 percent of web owners made any effort to ensure their sites were accessible and the same percentage were completely unaware of W3C published guidelines (Venter and Lotriet, 2005).

2. Methodology

The research was accomplished in three different stages: choosing the list of hospital sites, determining which accessibility guidelines to test, choosing the accessibility tool, and running each site through the accessibility software to determine the level of accessibility compliance.

The first phase of the study was to ~~choose~~ select a viable number of hospital websites from four geographical regions: Europe, Americas, Africa, and Asia. For each geographical area, four countries were chosen:

1. Europe – U.K., France, Germany, Italy
2. Africa/Middle East – Egypt, Kenya, South Africa, Saudi Arabia
3. Asia – China, India, Thailand, Philippines
4. Americas (North and South) – U.S.A., Canada, Mexico Venezuela

These countries were chosen because of the large number of potential hospital websites available to review. The web ranking site **"**Ranking Web of World Hospitals" is an initiative of the Cybermetrics Lab and ranks hospitals throughout the world on various factors (Cybermetrics Lab, 2016). When choosing hospitals, there needed to be at least 10 hospitals that were ranked in this site for each country. The top 10 hospital websites were chosen for the research.

The second phase of the study was to choose what accessibility factors to test. The WCAG level 2.0 was chosen as this is the most up-to-date set of guidelines from W3C (W3C, 2016e). The study would also gather statistics from two layers of guidance (A and AAA). 'A' was chosen because it meets the basic accessibility requirements, and 'AAA' meets the most stringent levels of tests.

The third part of the research was to choose an accessibility tool. As there are many tools available, it became necessary to analyze the tools for several factors when choosing the appropriate tool for the study. First, due to budget constraints, the tool had to be either free or a trial version which could be used within a 30-day window to compile results. Second, for ease of use, the tool should be available in an online mode, rather than needing to be downloaded and installed on a computer. Third, the accessibility software needed to test for WCAG level 2.0-AA conformance. The W3C publishes a list of evaluation tools that web operators can use to determine whether web content meets accessibility guidelines (W3C, 2016e).

Based on this list, several tools were researched. Some tools, such as Automated Accessibility Testing Tool from Paypal (Paypal, 2016) required software downloads and a high degree of technical understanding. Another potential tool, Access Monitor (Unidade ACESSO da FCT, 2016), was created for the Portuguese Public Administration, and the information was in Portuguese, and eXaminator toolkit (Benavidez, 2015) was for the Spanish market. Other tools had limited functionality testing, such as Contrast Finder (Tanaguru, 2016), which only tested WCAG contrast issues. Products such as PowerMapper were not free (PowerMapper Software, 2016). The software tool Tawdis (T.A.W. Funcdacion CTIC, 2016) was deemed the best solution for this study. The online tool had the ability to type in the site URL for testing instead of installing software and also had WCAG 2.0 (levels 'A' and AAA) guidelines.

3. Results

The results of the study showed that a majority of sites in all geographical regions had a number of errors in all WCAG levels. 15,663 total problems were found in the sites of the 16 countries (10,832 'A' problems and 4,830 AAA problems). Table 2 shows that Asia had the most number of problems at 5432 with 35% of the total errors, followed by the Americas (27.5%), EU (19%) and Africa/Middle East (18.5%). However, the total number of problems does differ based on the WCAG type. For WCAG 'A' problems, Asia had the greatest issues at 4459, while the Americas were next (2542), followed by Africa and then EU. The situation differs for AAA problems, with the Americas having the most (1764) with EU slightly behind at 1655. However, Asia (973) and Africa (438) show much lower AAA issues.

Table 3 displays the outcome for the total number of errors per country as well as the sites in compliance with 'A' and AAA levels. Column 1 shows the four geographical areas followed by the four countries for each area. Column three is the number of errors for 'A' level, while column five is the number of AAA errors for each country. Column seven is the total of the 'A' plus 'AAA' errors, while the last column is the percentage of errors for each country within the 4 geographical locations. Column four is the number of hospitals for each country that have met the compliance for 'A' rating, and have no 'A' level errors. Column six is the number of hospital sites who have perfect AAA compliance.

In the Americas, the hospital sites from the USA have the greatest percentage of errors, with 53% of the errors from all North American sites. Mexico, Venezuela and Canada are significantly behind and all are within similar numbers of errors. The statistics for the EU are similar, with one country far dominating others with the total number of errors. For the EU, Germany has 54% of the WCAG errors, while the UK, France and Italy all display similar numbers of errors. For Asia, China (41%) and Thailand (33%) had significant errors, while Philippines (14%) and India (12%) had fewer. For Africa, results ranged from 30% for Saudi Arabia, down to 20% for Kenya.

Table 3 also shows the level of compliance for hospital sites for each country. Venezuela and France had 2 hospital sites with total AAA compliance. Kenya, Thailand, China, Italy and Germany had 1 hospital site with no AAA errors. Only France and Thailand each had 1 conforming hospital site for 'A', and the combination of 'A' and AAA levels.

Table 4 illustrates the overall statistical result for each of the four geographical areas in terms of average number of errors. The average number of WCAG problems for each website is 97. The table shows the difference between sites for each continent. Europe and Africa/Mid East have a better than average result in problems compared to the other regions. The Asian hospital websites show the worst accessibility problems, being 35 points below the average of 97, and the Americas also showing a poor rating.

Table 5 shows the most common types of problems for each of the regions. For 'A' WCAG level, the most common issue by far was non-text content. This often occurs when non-text content (such as images) do not have a text alternative that serves the equivalent purpose (W3C, 2016b). The second most common error in hospital sites at the 'A' level is 4.1.1 (parsing). This occurs when start and end tags are missing a critical character in their formation, such as a closing angle bracket or a mismatched attribute value quotation mark (W3C, 2016c). For the AAA level, the most common problem was 2.4.9 (Link Purpose) with 4055 total problems throughout the sites. This mechanism should allow each link to be identified from link text alone (W3C, 2016a). The next two most common problems dealt with section headings and keyboard exceptions, and the numbers compared to 2.4.9 issues were significantly lower.

4. Implications and Discussion

This study addressed three research questions:

1. How many hospital sites and countries meet minimum WCAG disability standards?
2. What are the most common types of accessibility problems?
3. Is there a significant difference in accessibility compliance between regions and countries?

European and African/Middle Eastern hospitals tended to do better than their counterparts in the Americas and Asia. The top four countries with WCAG accessibility problems are USA, China, Thailand and Germany. These results are especially troubling for the USA and German sites. The literature review has shown that there are strict disability laws for both these countries with regards to website accessibility. Yet, these two countries are among the worse in terms of actual adherence to the specific accessibility laws, as opposed to China and Thailand which do not have strict web accessibility laws. One disappointment of the study was the number of sites that did not meet WCAG minimum standards. Only two hospital sites (one in France and one in Thailand) were fully compliant with both WCAG 'A' and AAA.

This situation raises a number of concerns. First, these results show that persons with disabilities may face problems accessing hospital websites, thus placing them in a position where they do not have the same inclusivity as people without disabilities.

Second, this leaves the question of why so many web sites are not following the legal mandates. There could be a myriad of reasons for this, ranging from ignorance of the law to designers who may not understand accessibility design requirements. A further phase of this study would be to conduct further research into reasons why so many sites in countries with legal mandates are not adhering to the legal requirements. Another possible area for future research would be to investigate what sort of assistance is needed by web designers in countries without strong accessibility mandates.

5. Conclusion

Overall, the research indicates that there are notable concerns regarding the lack of compliance with basic web accessibility measures worldwide, which brings consequences for those with disabilities. Though there is a call for acknowledgement and adherence of e-accessibility, results show a clear majority of hospital websites which simply are not addressing this concern. The results are somewhat unsurprising in regards to accessibility errors on hospital websites within countries such as Thailand, who do not have formal legislative agreements for specific web accessibility. Yet what brings major concern are the severity of errors occurring on sites within countries who have established laws and guidelines in place, especially in relation to the overwhelming lack of compliance with basic level A guidelines which should be considered mandatory for all sites. With only two hospital sites having fully complied with level A guidelines, this is a surprising revelation which shows the abundance of tested websites violating inclusivity for all users, by ignoring simple to fix errors, such as placing ALT tags on images. To conclude, this poses the question as to why WCAG guidelines and legislation are ineffective.

Table 1: WCAG Principles, Guidelines, Success Criteria and Level (W3C, 2016g).

Principle	Guideline	Success Criteria/Level
Perceivable	1.1 Text Alternatives	1.1.1 Non-text Content – A
	1.2 Time-based Media	1.2.1 Audio and video only – A 1.2.2 Captions – A 1.2.3 Audio Description or Media - A 1.2.4 Captions (live) - AA 1.2.5 Audio Description - AA 1.2.6 Sign Language - AAA 1.2.7 Extended Audio Description - AAA 1.2.8 Media Alternative - AAA 1.2.9 Audio-only - AAA
	1.3 Adaptable	1.3.1 Info and Relationships - A 1.3.2 Meaningful Sequence - A 1.3.3 Sensory Characteristics - A
	1.4 Distinguishable	1.4.1 Use of Color – A 1.4.2 Audio Control – A 1.4.3 Contrast – AA 1.4.4 Resize Text - AA 1.4.5 Images of Text - AA 1.4.6 Contrast - AAA 1.4.7 Low or No Background Audio - AAA 1.4.8 Visual Presentation - AAA 1.4.9 Images of Text (no exception) - AAA
Operable	2.1 Keyboard Accessible	2.1.1 Keyboard – A 2.1.2. No Keyboard Trap – A 2.1.3 Keyboard (no exception) - AAA
	2.2 Enough Time	2.2.1 Timing Adjustable - A 2.2.2 Pause, Stop, Hide - A 2.2.3 No Timing - AAA 2.2.4 Interruptions - AAA 2.2.5 Re-authenticating - AAA
	2.3 Seizures	2.3.1 Three Flashes or Below Threshold – A 2.3.2 Three Flashes - AAA
	2.4 Navigable	2.4.1 Bypass Blocks – A 2.4.2 Page Titled – A 2.4.3 Focus Order – A 2.4.4 Link Purpose – A 2.4.5 Multiple Ways – AA 2.4.6 Heading and Labels – AA 2.4.7 Focus Visible – AA 2.4.8 Location - AAA 2.4.9 Link Purpose - AAA 2.4.10 Section Headings - AAA
Understandable	3.1 Readable	3.1.1 Language of Page - A 3.1.2 Language of Parts - AA 3.1.3 Unusual Words - AAA 3.1.4 Abbreviations - AAA 3.1.5 Reading Level - AAA 3.1.6 Pronunciation - AAA
	3.2 Predicable	3.2.1 On Focus – A 3.2.2 On Input – A 3.2.3 Consistent Navigation - AA 3.2.4 Consistent Identification – AA 3.2.5 Change on Request - AAA
	3.3 Input Assistance	3.3.1 Error Identification – A 3.3.2 Labels or Instructions – A 3.3.3 Error Suggestion – AA 3.3.4 Error Prevention (Legal) – AA 3.3.5 Help – AAA 3.3.6 Error Prevention (All) - AAA
Robust	4.1 Compatible	4.1.1 Parsing – A 4.1.2 Name, Role, Value - A

Table 2: Total problems per continent

Continent	A Total	AAA Total	Total	Percent
Asia	4459	973	5432	35%
Americas	2542	1764	4306	27.5%
EU	1371	1655	3026	19%
Africa/Mid East	2460	438	2898	18.5%
Total	10,832	4,830	15,662	100%

Table 3: Total number of errors and compliance

Area	**Country**	**A Total**	**A Sites**	**AAA Total**	**AAA Sites**	**Total Problem**	**A/AAA Sites**	**Percent**
Americas	Mexico	525	**0**	117	0	642	0	15%
	Venezuela	547	**0**	120	2	667	0	15%
	Canada	526	0	206	0	732	0	17%
	USA	944	0	1321	0	2265	0	53%
EU	Germany	239	0	1400	1	1640	0	54%
	UK	425	0	79	0	504	0	17%
	France	426	1	41	2	467	1	15%
	Italy	281	0	134	1	415	0	14%
Asia	China	1651	0	551	1	2202	0	41%
	Thailand	1585	1	222	1	1807	1	33%
	Philippines	637	0	121	0	758	0	14%
	India	586	0	79	0	665	0	12%
Africa/ ME	Kenya	526	0	55	1	581	0	20%
	Egypt	579	0	60	0	639	0	22%
	South Africa	681	0	132	0	813	0	28%
	Saudi Arabia	674	**0**	191	**0**	865	0	30%

Table 4: Average errors

Continent	Continent Average	Overall Average	Difference	Result
Europe	75	97	-22	Better than average
Asia	132	97	35	Worse than average
Americas	108	97	11	Worse than average
Africa/Mid East	72	97	-25	Better than average

Table 5: Top Problems for each area

Level	**Problem**	**Europe**	**Asia**	**Americas**	**Africa/ Mid East**	**Total**
A	1.1.1 non-text content	242	1330	874	570	3016
A	4.1.1 - Parsing	410	969	563	612	2554
A	1.3.1 - Info and Relationships	361	774	564	671	2370
AAA	2.4.9 - Link Purpose (Link Only)	1551	753	1591	260	4155
AAA	2.4.10 - Section Headings	80	92	121	87	380
AAA	2.1.3 - Keyboard (No Exception)	24	128	50	89	291

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