Accessibility Pillars in Web and Design

Overview

The Americans with Disabilities Act is a civil rights law that prohibits discrimination against, and requires equitable access for, people with disabilities. Digital accessibility is considered covered under the large umbrella of equal access to public areas that ADA guarantees.

Title II of ADA enforces digital accessibility compliance by requiring state and local government websites and digital tools be accessible to people with disabilities — the Department of Justice has announced a compliance deadline of April 24, 2026, for jurisdictions of 50,000+ people and April 26, 2027, for smaller entities.

ADA and Sections 504 and 508 of the Rehabilitation Act of 1973 use the same criteria to determine accessibility.
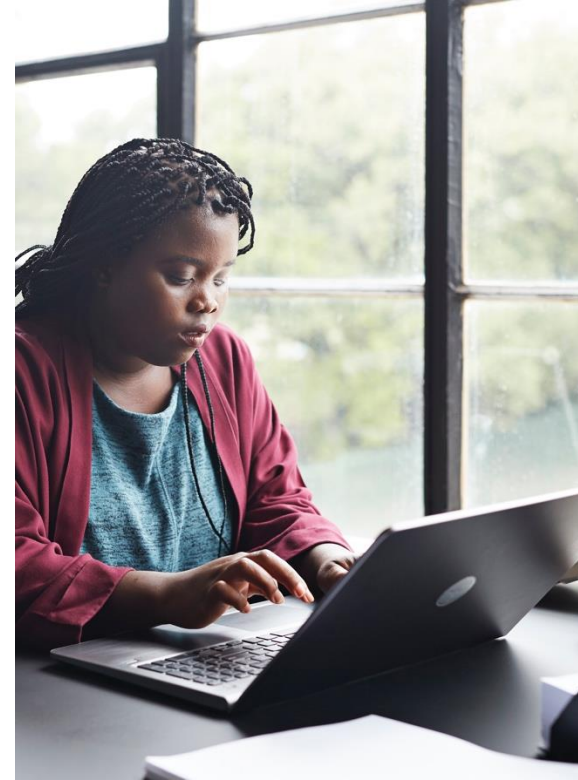
Accessibility Standards

The federal government has identified WCAG 2.1 AA as the standard for accessibility compliance.

The Web Content Accessibility Guidelines, or WCAG, is published by the [World Wide Web Consortium](#) (W3C), an international organization that establishes open web standards. WCAG is currently in its second version.

When evaluating compliance, there are three different WCAG conformance levels:

- A (lowest)

- AA (middle)

- AAA (greatest)

Interestingly, W3C recommends that all web-based information aim to hit AA because it is not possible for some types of content to reach AAA compliance.

WCAG and POUR

WCAG standards are principle-based, which means that rather than requiring all web browsers to meet a specific technical standard, WCAG requires that digital content adheres to the POUR principles. All four principles focus on the user's experience:

- **Perceivable**: All information must be presented in a way that ensures users can perceive it using at least one of their senses.

- **Operable**: A website is considered operable if all users can effectively navigate it, even those who employ [assistive technology](#), such as [screen readers](#).

- **Understandable**: This is a two-pronged principle — users must be able to understand how to use a site and understand its content.

- **Robust**: Content must be robust enough that multiple technologies, including assistive devices like screen readers, can interpret it.

What is Digital Content?

Digital content is more than just websites and social media. It's also email, PDFs, Word documents, and the like. If you're reading it on a computer, phone, or tablet – it's digital content.

Websites

Social Media

Email

PDF

Word

Excel

PowerPoint

Structure and Style

Webpages and Word documents have built-in styles that help keep your document consistent and make them more accessible. For example, screen readers use headers and lists to navigate pages and documents, making it easier for users to understand.

Headers should always be used and should be deployed in order. Use H1 for the title, H2 for section headers, H3 for subsections, and so on, down to H6.

Lists should be deployed thoughtfully. Use an ordered list if you are outlining steps in a process. Use an unordered list for things that are not sequential (e.g., ingredients in a recipe).

Bonus: Using structures and styles in Word may give you a head start on turning that document into an accessible PDF.

Figure 1: Microsoft Word Style Pane

Figure 2: Header Hierarchy

Source: 508Section.gov
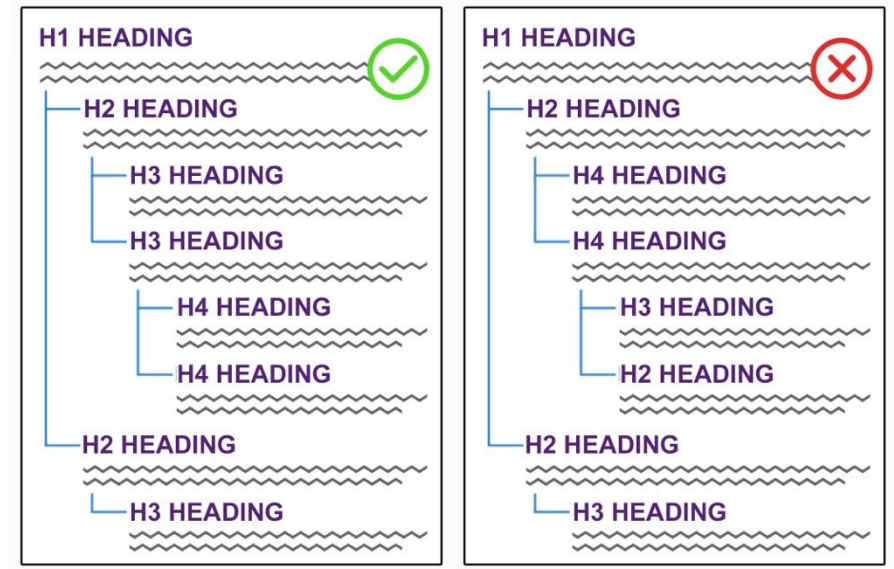
Linking Best Practices

- **Use Descriptive Link Text**
  Screen reader technology allows low vision users to navigate webpages, and other digital content, in a variety of ways. One of them is by jumping from link to link without referencing the content around that link. This means linked text should be descriptive enough to stand on its own.

- **Use Links Sparingly**
  When a screen reader reaches a link in the content, the software will announce it. When links are used sparingly, this is not particularly disruptive to the reading experience, but over-linking can make it hard for a user to keep track of the content.

- **Keep Link Text Consistent**
  Creating a consistent experience is important for all users, but especially those who rely on screen readers. With that in mind, try to make sure you are not using the same words to link people to different places. For example, if you are writing a blog post and use the text "*Health Affairs* article" to link users to an article from March 2023, don't use the same phrase later in your product to send users to a *Health Affairs* article from September 2021.

- **Use Links Strategically**
  Think about linking from a user's perspective and to make sure that the link text and the destination make sense together. There are few things more confusing than clicking on a link and wondering if it took you to the wrong place.

Additional Tips

- **Using plain language** is a great way to make sure you get your message across.

- **Avoid directional language**. "Above" and "below" are common terms, but assistive technology can't determine spatial direction. Instead, use the name of the section/figure/table you're referring to, which will allow the user to make the connection when they arrive there.

- **Provide transcripts** for all pre-recorded multimedia (e.g., webinar recordings, podcast episodes).

- **Include captions on videos**. This is helpful for people who are hard of hearing and for those in very loud, or very quiet, settings.

Figure 4: Accessibility and Usability Venn Diagram

# Accessibility Requirement Examples

astho®

- Users with fine motor skill impairments need to be able to perform functions using a keyboard alone.

- Any interactive elements on-screen should be clearly highlighted upon receiving focus.

- Text alternatives for non-text elements are required.

- The correct color contrast ratios should be applied and color alone should never be used to convey meaning.

- Documents should be organized in a way that doesn't require an associated style sheet.

- If server-side image maps are necessary, an alternative way to display this information needs to be implemented to make it compatible with screen readers.

- Tables should be carefully coded to clearly indicate whether a cell is a header, column, or row, making it easier for assistive technology to interpret.

- Any embedded content should be placed in an inline frame container or iframe having an accessible name.

- Any flickering or flashing content should be limited or removed completely. If it is used, objects should not flash more than 3 times per second.

- If users require an applet, software, or a plugin to interpret content, a link must be provided.

- Users should be able to skip directly to content and avoid repetitive navigation.

Design's Approach

Working towards implementing accessibility best practices is a tedious and a detail-oriented process that has a lot of elements that need to work together to create a seamless result. This process is often the final touch we add to our products via Adobe Acrobat Pro. Elements like document length and quantity of charts, graphs, and images contribute to the time it takes to complete the final product.

The main subject matter we focus on to achieve this are:

Color Contrast .... **Fonts** .... **Tables and Graphs** .... **Alt Text** .... **Reading Order** .... **Tags**
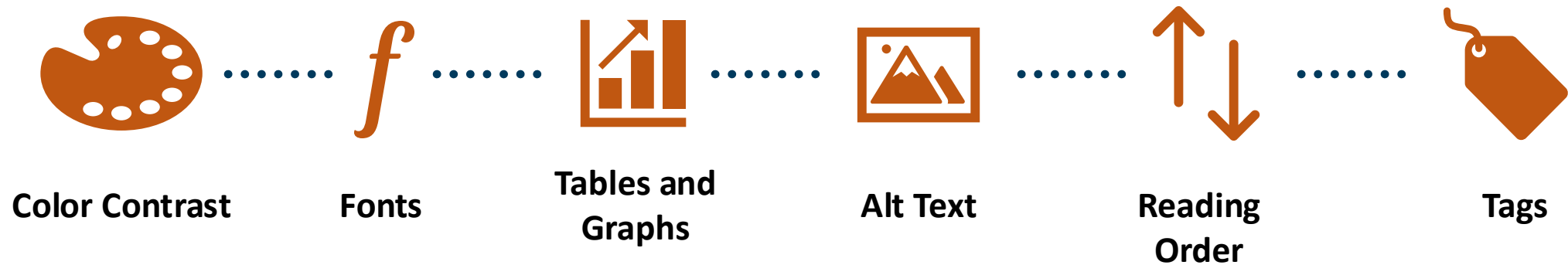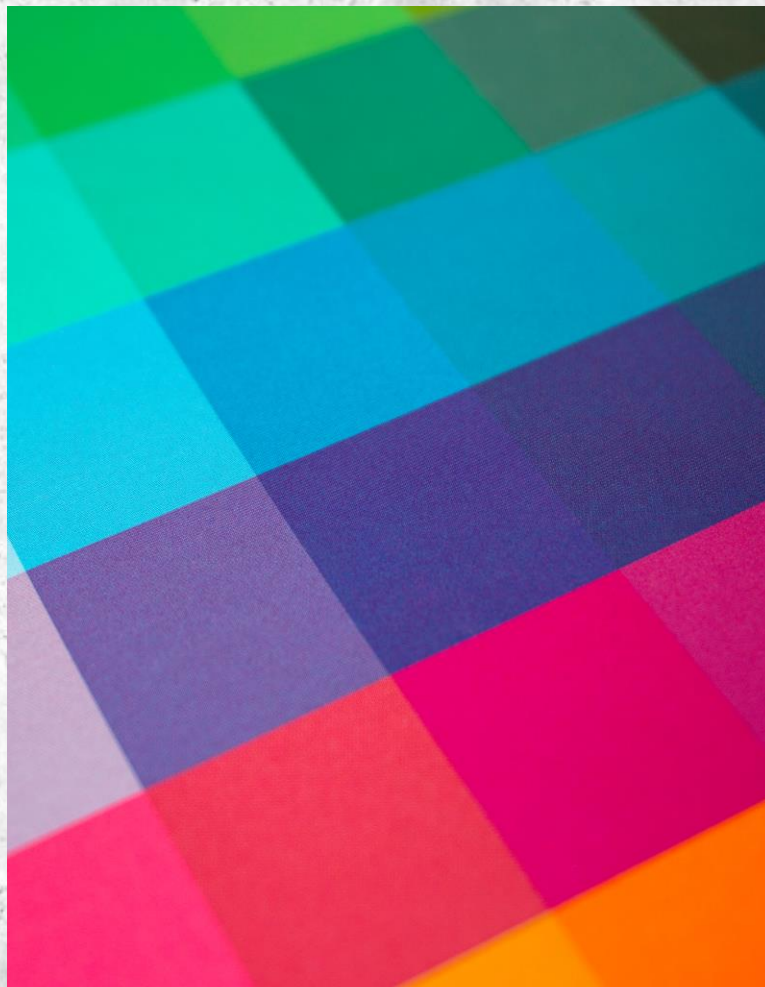
Color Contrast 🎨

Color contrast impacts the readability of our content on the web and in print. It is especially important for users who are low vision or for users who are colorblind. Good color contrast means all users can see your content no matter the device they're using or the lighting of their surroundings.

The current color contrast ratio to be met is 4.5:1. This is considered Web Content Accessibility Guidelines (WCAG) AA. AA is the minimum requirement for design to pass web standards. WCAG AAA exceeds the requirement at a ratio of 7:1.

Color Contrast 🎨

The main symptom of color vision deficiency is not seeing colors the way most people do. If you have color vision deficiency, you may have trouble seeing:

- The difference between colors
- How bright colors are
- Different shades of colors

Prominent color blindness types include:

- Protanopia – absence of red and green
- Deuteranomaly – difficulty in distinguishing red and green
- Tritanopia – rare form of blue and yellow color blindness

NORMAL VISION

https://it.ucsf.edu/how-to/accessible-color-best-practices

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https://www.visioncenter.org/conditions/color-blindness/

NORMAL VISION

PROTANOPIA

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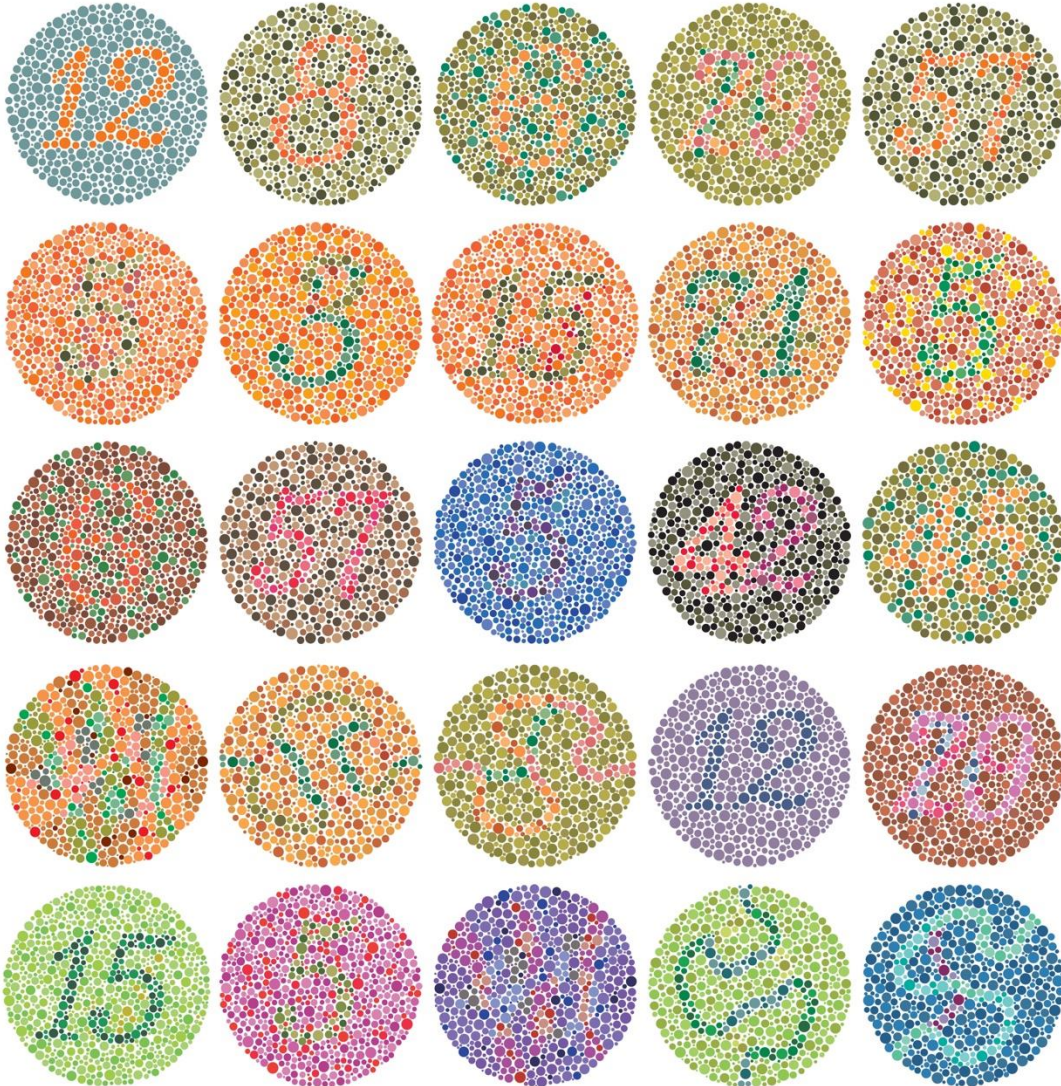- Tritanopia – rare form of blue and yellow color blindness

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Ishihara Test

Color Contrast

The Ishihara test is a [color vision test](#) for detection of red–green [color deficiencies](#). Created in 1917, by Shinobu Ishihara, each plate depicts a solid circle of colored dots appearing randomized in color and size.[3] Within the pattern are dots which form a number or shape clearly visible to those with normal color vision, and invisible, or difficult to see, to those with a red–green color vision deficiency.

https://en.wikipedia.org/wiki/Ishihara_test

Fonts *f*

Some fonts and typefaces are easier to understand than others. An accessible font is a font that will not exclude, nor slow down the reading speed of any website visitor. Choosing the right font improves the legibility and readability for everyone. This allows for you to reach more people.

Size, color, and contrast are the three key factors that determine whether a font is accessible.

Bad	Good
Harrington	Helvetica
Imprint MT Shadow	Azo Sans
Chalkduster	Rockwell
Bradley Hand	Times New Roman
CopperPlate	Century Gothic
Snell Roundhand	Tahoma

Fonts f

Another factor to consider is a characteristic known as "ligatures". This is the binding of two letters to form a single glyph. Some fonts struggle in displaying these glyphs and it can be problematic for some to read.

Figure 4: Accessibility and Usability Venn Diagram

Source: 18th Century Ligatures and Fonts
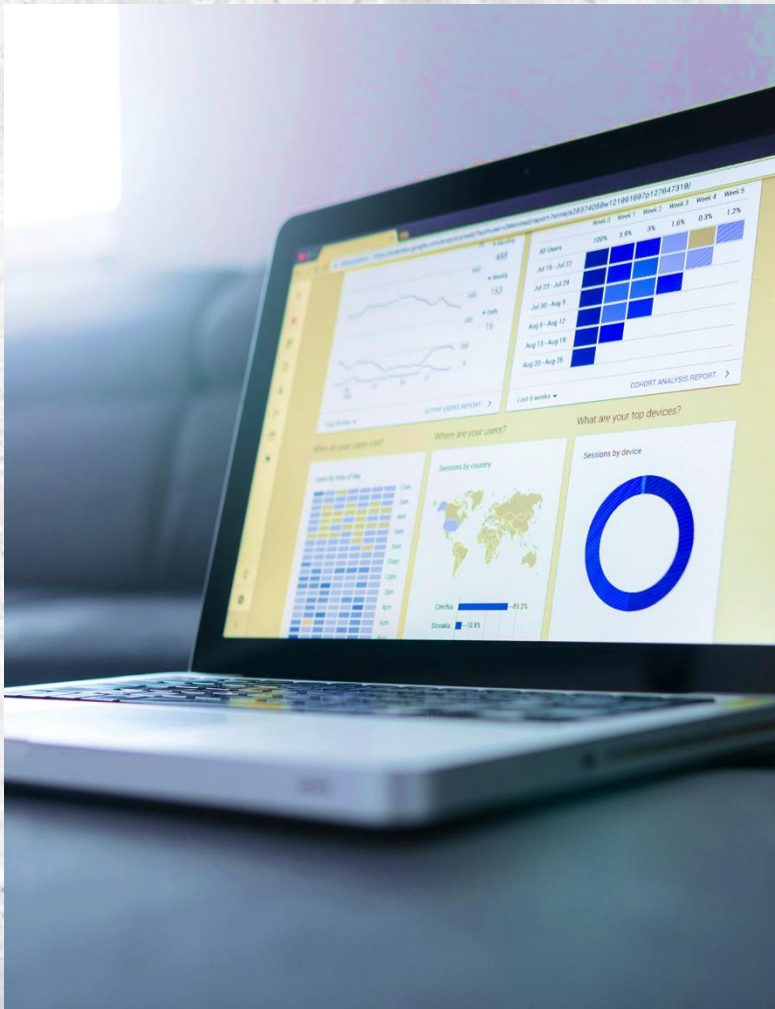
Tables and Graphs

Tables, charts, and graphs can be challenging for users with assistive technology or cognitive difficulties. Best practices to make the experience easier include:

Add Titles, Captions, and Summaries

- Use descriptive names and consistent numbering (e.g., Table 1, Figure 2).
- Use Word's Insert Caption tool (References tab) to automate numbering and create appendices.
- Always include a meaningful name, not just a number.

Keep the Structure Simple

- Avoid merged cells and keep tables to a single page when possible.
- Assistive tech reads tables top-to-bottom, left-to-right.

Tables and Graphs

Simple Table

CSS3 Browser Support (latest browser versions)					
CSS Property	**Internet Explorer**	**FireFox**	**Chrome**	**Safari**	**Opera**
Border Radius	YES	YES	YES	YES	YES
Box Shadow	YES	YES	YES	YES	YES
CSS Animations	NO	NO	YES	YES	NO

Complex Table

Day	Seminar		
	Schedule		Topic
	Begin	End	
Monday	8:00 a.m.	5:00 p.m.	Introduction to XML
			Validity: DTD and Relax NG
Tuesday	8:00 a.m.	11:00 a.m.	XPath
	11:00 a.m.	2:00 p.m.	
	2:00 p.m.	5:00 p.m.	XSL Transformations
Wednesday	8:00 a.m.	12:00 p.m.	XSL Formatting Objects

Specify the Table Header

- Set header rows to ensure screen readers interpret tables correctly.
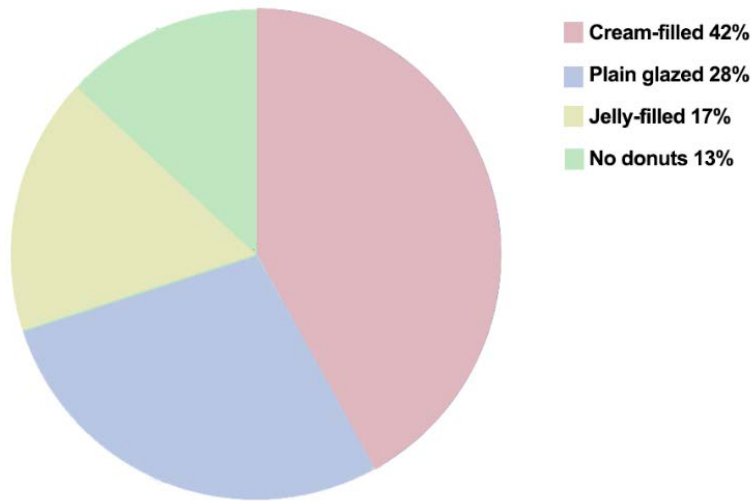- Helps maintain structure across multi-page tables.

The best way to maximize the accessibility is to use *Simple Tables*. Simple Tables have the same number of columns throughout all rows with no header cells merged or tiered. *Complex Tables* have a table with tiers of headings (either column or row headings) or a table with merged header cells.

Screen readers do not understand Complex Tables and require adjusting the tags and properties of the table. This is one of the more time intensive procedures.
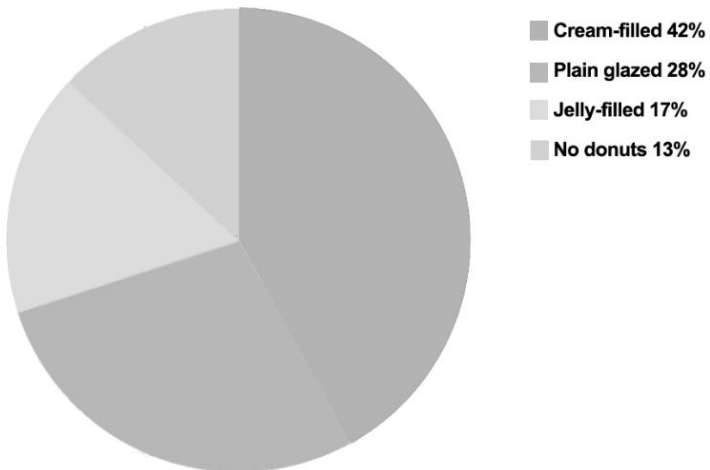
Source: Stackoverflow
Source: Webflow

Tables and Graphs

AMERICANS' FAVORITE DONUTS

Cream-filled 42%
Plain glazed 28%
Jelly-filled 17%
No donuts 13%

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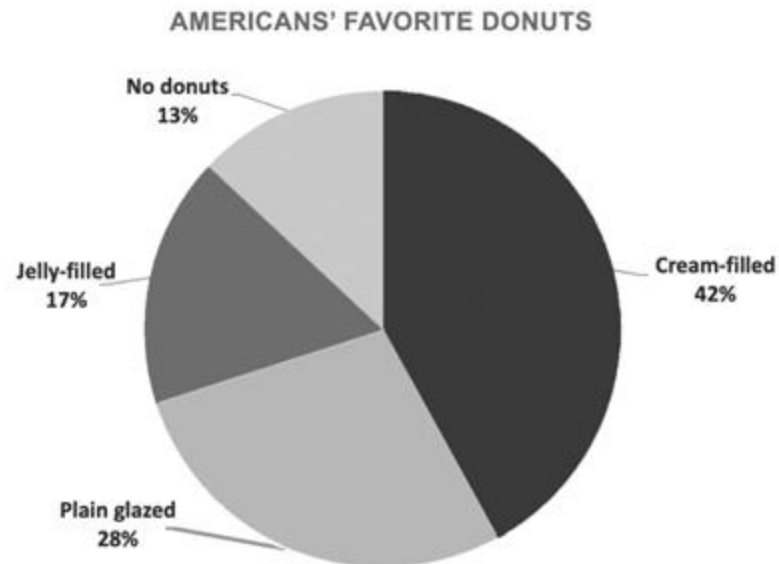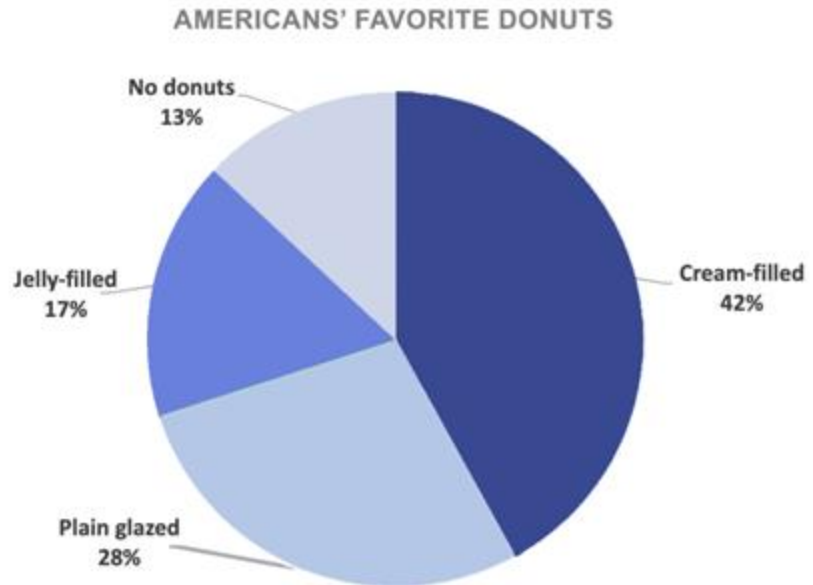Plain glazed 28%
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1. If the data in a chart, graph or map is crucial to the content of a Web page, then you must provide a text description of the image. WCAG 2.0 Guideline 1.1.1—"All non-text content that is presented to the user has a text alternative that serves the equivalent purpose…"

2. Supplement color-coding of charts with texture, differences in line style, text in graphs or different shades of color to improve accessibility for colorblind users. Charts should be readable in black and white. *Note: The default settings of the Chart Wizard in Excel are not color accessible. Use the formatting tools to change line styles and colors.*

https://accessibility.asu.edu/articles/complex-images
https://accessibility.psu.edu/images/charts/#chartcolor

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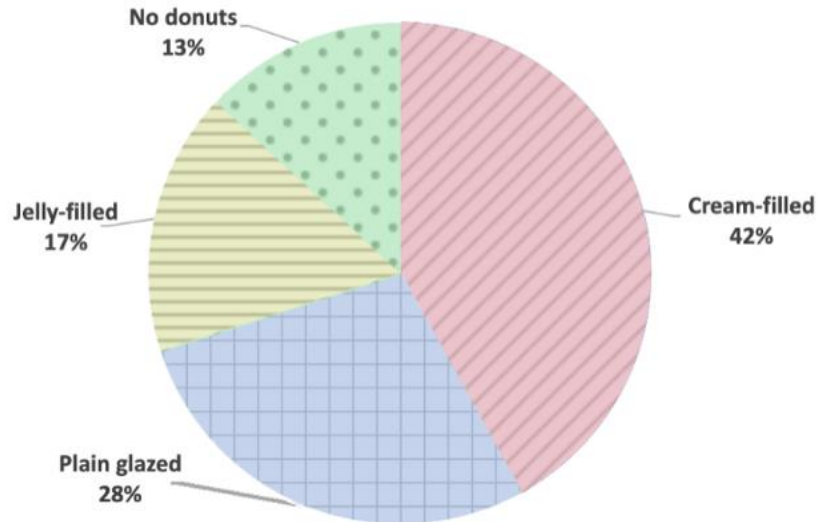- Plain glazed 28%
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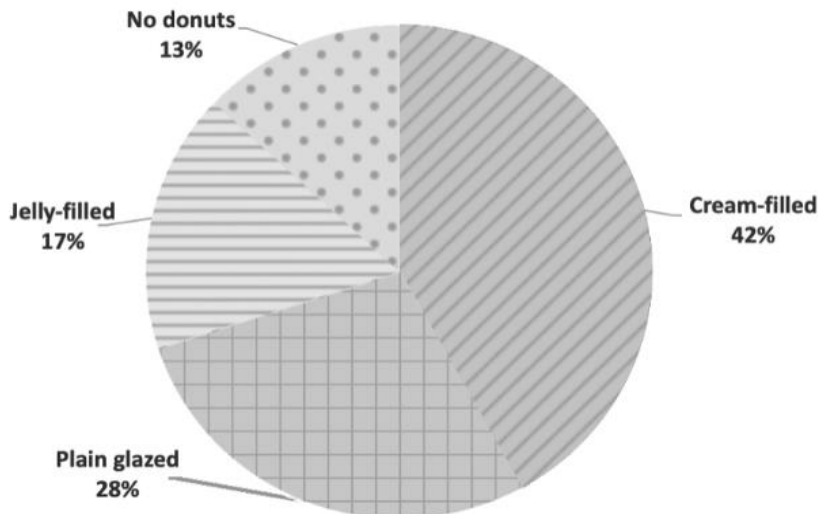
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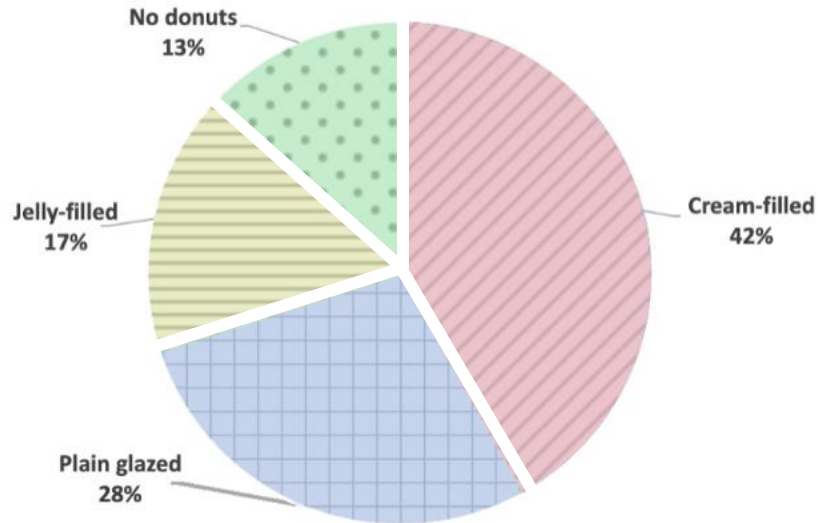https://accessibility.psu.edu/images/charts/#chartcolor

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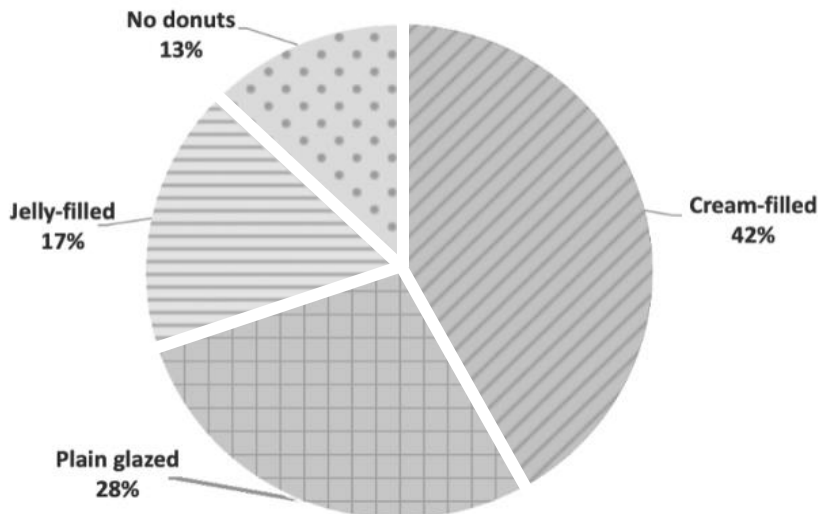
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https://accessibility.psu.edu/images/charts/#chartcolor

Alt Text 🏞

A picture is worth a thousand words, right? In our work, images and graphics serve three main purposes.

1. To provide a more concise narrative of the project through visual means.

2. To break up long lines of text that, that when unaddressed, causes readers' fatigue.

3. To provide clean formatting when paragraphs have odd breaks between pages.

Part of compliance for imagery is to incorporate alternative text (or alt-text) to the graphics and charts. Alt-text enables screen readers to read the information about on-page images for the benefit of a person with visual impairment, or when there is a reason for the inability to view the images on the page (in case it doesn't load).
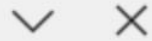
Alt Text

Best practices for alt text:

- Be succinct. The ideal length is between a few words and a couple short sentences, target 150 characters. The goal is to be brief, but still let users know what important information the image conveys.

- Avoid phrases like "image of," because screen readers will identify all images as a "graphic."

- For complex images such as charts or graphs, make sure you communicate what the graph is telling users, rather than just telling them what it looks like.

- Not all images convey information. In those cases, add "decorative" as the alt text — this will let the screen reader know that the image is considered decorative. impairment.

Alt Text

Best practices for alt text:

- Context is important. Keep in mind that the context around the image is just as important as the alt text — if you already have a detailed description of a painting in the body of the document, it is not necessary to repeat all that information in the alt text.

- Additionally, alt text makes content accessible to other users, like those who may have difficulty understanding the meaning of the visual content, or users without access to high-speed internet who cannot access images on the web. It also makes the visual content available for technical applications, such as Search Engine Optimization (SEO), digital assistance, and artificial intelligence.

Alt Text

How would you describe this object and its context to someone who is blind or low vision?
- The subject(s) in detail
- The setting
- The actions or interactions
- Other relevant information

(1-2 detailed sentences recommended)

Generate alt text for me

☐ Mark as decorative ⓘ

Reading Order ↕

Reading Order determines the order in which assistive technology will read content. Without correct reading order, users may end up very confused or get lost on the page. Setting the reading order:

- Allows text-to-speech or screen reading software to read information sequentially.

- Ensures that keyboard and screen reader users can navigate menus, links and form fields items sequentially when using the tab key.
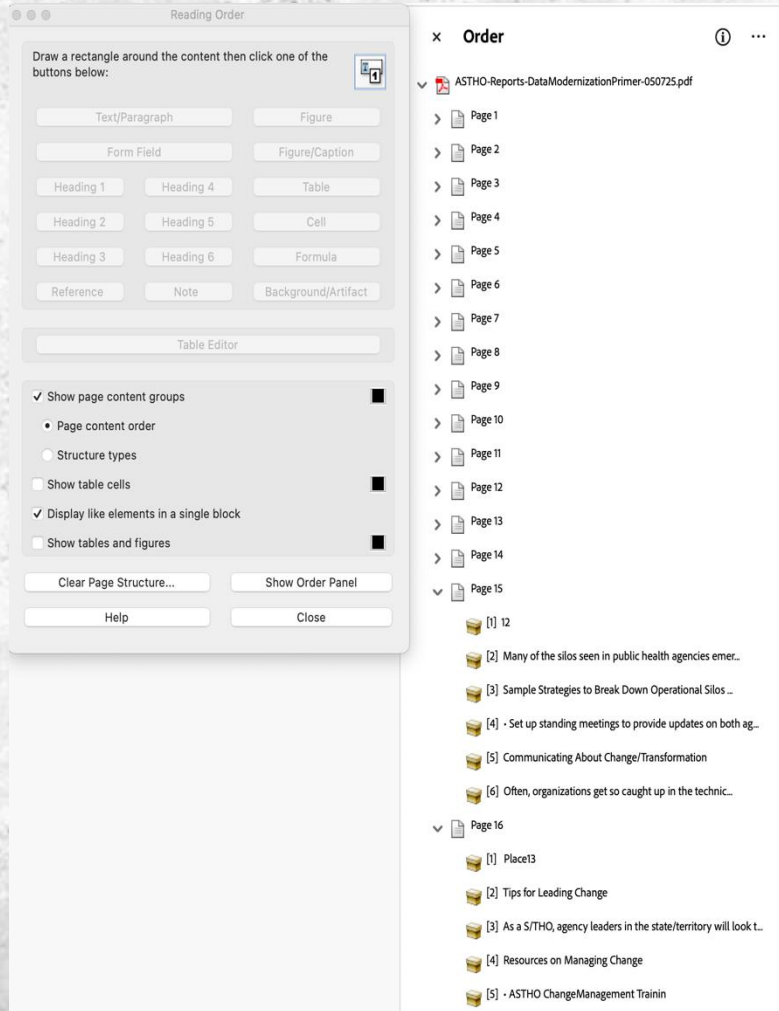
Developing a Data Strategy and Data Governance Policy

Data Strategy Overview

In order for agencies to be able to properly detect, monitor, mitigate, and respond to emerging public health threats, core public health data must be shared between key public health and health care institutions. Analyzing data from multiple sources helps to provide a clearer picture of what is going on and can inform better decision-making. A data strategy outlines the data, technology, policy, and administrative actions needed to be able to share data efficiently and securely across the public health ecosystem.

Developing a Data Strategy

A good place to start is to identify how you are collecting and sharing core data sources within your state or territory. Core data sources are essential to identifying diseases and conditions, detecting emerging public health threats, and understanding disease burden and severity across different populations. It is likely that public health agencies in your state or territory have already conducted a data modernization assessment, which can serve as a helpful starting point. Data modernization leadership should review this assessment, as well as the agency's data modernization plan, to see what the findings revealed about current gaps and capacities and if there are any planned projects to address these concerns. This review will help determine which areas to focus on. Below are a few sample activities to consider when developing a data strategy.

Core Data Sources Identified in CDC's Public Health Data Strategy

- Case data
- Laboratory data
- Emergency department data
- Vital statistics data
- Immunization data
- Health care capacity and utilization data

- Invest in reusable technologies that can link multiple data streams.
- Adhere to interoperability policies and standards such as USCDI/USCDI+, FHIR, and HL7.
- Implement an electronic test orders and results system via web portal, direct integration, or use of an intermediary to your agency to electronically exchange test orders and results with multiple health care partners.
- Connect to intermediaries such as the APHL's Informatics Messaging Services platform, ReportStream tool, or health information exchanges for lab data.
- Ingest electronic case reporting data into disease surveillance systems.
- Invest in data visualization tools and trainings to better communicate findings from data.
- Explore the use of data sharing agreements and participating in TEFCA networks to reduce overhead and operate within a community of practice.

In addition to core data sources, there are many other data sources a state or territory can combine to provide a better picture for public health action. The COVID-19 pandemic provides one example of this. At the beginning of the pandemic, the federal government advised that people isolate in their homes and limit interaction with others. To determine whether people were in fact adhering to these recommendations, public health professionals combined motor vehicle data and cell phone data to create a more complete picture of a community's mobility during this time. The data provided general ideas of how far people were traveling within their communities when infection rates were highest. Other examples include using weather data to help predict upswings in asthma hospitalizations or using wastewater testing data to determine the presence of viruses in college dormitories.
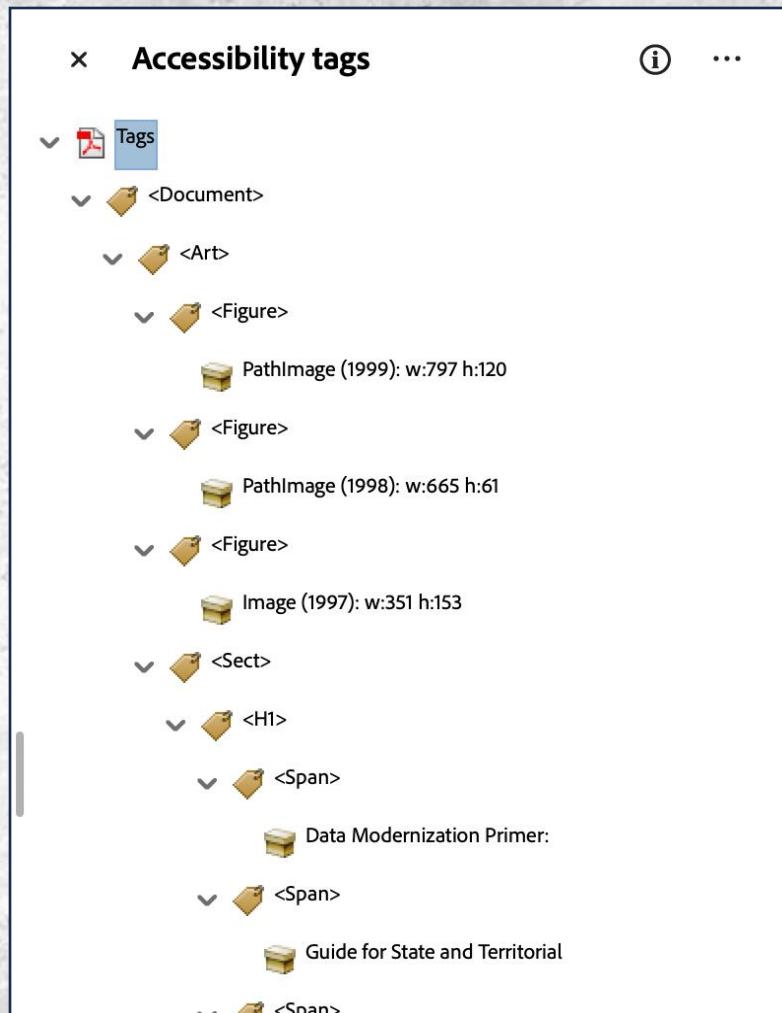
Data Governance Overview

Tags 🏷️

Tags provide a hidden structured, textual representation of the PDF content that is presented to screen readers. For example, documents that have visual lists can be tagged with list tags, documents that have visual data tables can be tagged with table tags, etc. They exist for accessibility purposes only and have no visible effect on the PDF file.

When a PDF is created from a Word doc, initial tags will be generated based on the styles used from the Word doc.

There are multiple tag types used to label the various text and graphical elements. Some require many lines of labeling, such as "Lists" for numbers or bullets (List, List Item, List Lable, List Body) or "Tables" (Table, Table Row, Table Header, Table Data).

https://www.hhs.gov/sites/default/files/pdf-tagging.pdf

Quiz Time

Question 1

This image appears in a feature article titled "The Emotional Connection Between Farmers and Their Crops" on an agricultural advocacy website. Which alt text is the best option for this scenario?

1. Man with corn.

2. Man with blue shirt and gray hat hugging an ear of corn.

3. A smiling man in a blue shirt and gray hat hugs a large ear of corn in a woodsy surrounding, symbolizing the deep emotional bond farmers have with their crops.

4. Decorative (or Mark as Decorative)

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or

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Question 2

You're reviewing a colleague's draft of a blog post about your company's new sustainability initiative. The post includes a link to more information. Which of the following examples demonstrates the best linking practice?

1. "Click here to read more about our efforts."

2. "We've launched a new program to reduce our carbon footprint. Read more."

3. "Learn more about our sustainability initiative to reduce carbon emissions."

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Question 3

You are preparing a Word document for public distribution, and you want to make sure that screen readers can navigate it easily. What is the best way to structure the document?

1. Use bold text and larger font sizes for section titles.

2. Use Word's built-in heading styles.

3. Insert text boxes for each section.

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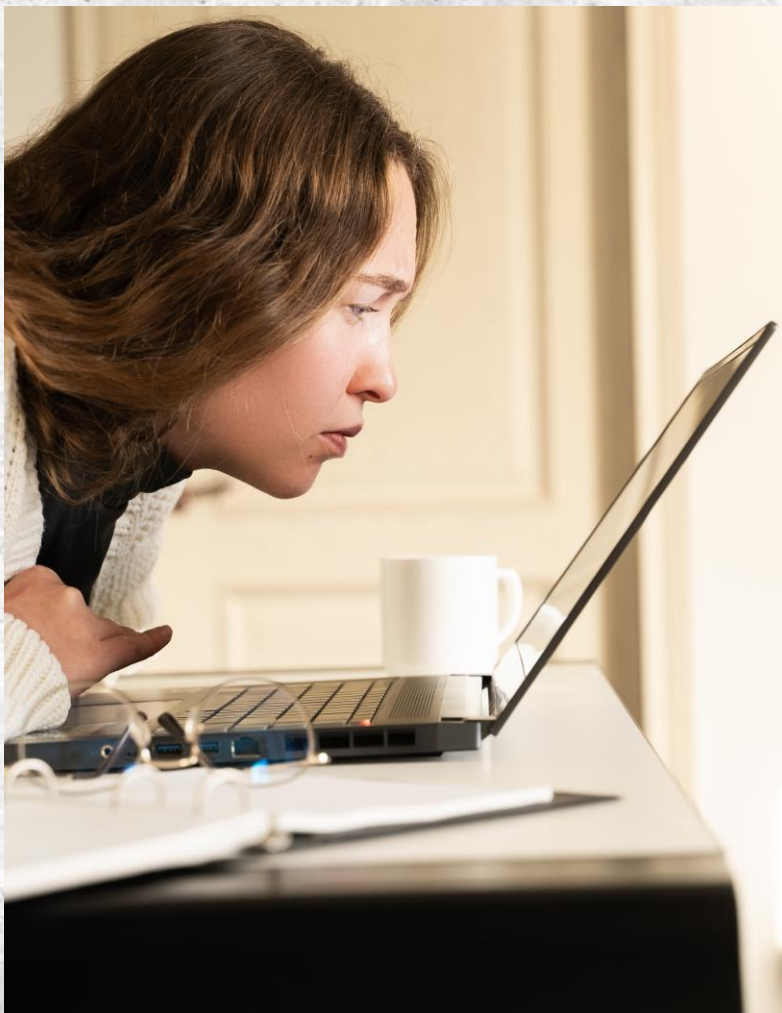
1. Use bold text and larger font sizes for section titles.

2. Use Word's built-in heading styles.

3. Insert text boxes for each section.

What are the Benefits?

There's more to accessibility than legal compliance!

- 25-30% of Americans identify as having a disability. Compliant content means you are reaching more of your audience.

- Up to 10% of the U.S. population has some sort of colorblindness. Using best practices for color means that more people can interact with your content.

- Plain language improves scannability and readability, letting you connect with a larger audience.

- Following best practices also provides search engines with helpful information, which can in turn help your SEO ranking.

- Sighted users also benefit! Using headers in order helps sighted users scan the content. Too many links can be visually overwhelming (and lead users away from your content).

Thank You!

Feel free to reach out to any of us at ASTHO if you have questions:

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Emily Lapayowker – Assistant Director, Web at elapayowker@astho.org

Heidi Satter – Director, Web and Data Solutions at hsatter@astho.org