AN ANALYST'S GUIDE TO ADVANCING EQUITY IN DATA VISUALIZATION

UNC Health's Equity and Inclusion Analytics Workgroup
UNC HEALTH STANDARDS

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INTRODUCTION

Health equity implies that every person has the opportunity to attain their full health potential and that no one is disadvantaged from achieving this potential because of social position or other socially determined circumstances (Centers for Disease Control and Prevention, 2022). Embedding equity into data & analytics includes promoting the disaggregation and analysis of data between demographic groups to examine differences and incorporating equity principles into visualizations. These efforts are foundational to achieving health equity, as it enables the identification of inequities, data-driven decision-making to develop interventions, and monitoring progress in decreasing care variation.

These standards intend to support data analysts and all others involved in the creation of data visualization tools to embed equity into new and existing data displays. The purpose of these standards is to:

- Combat bias in dashboards and other data visualizations, and
- Guide data analysts to embed equity into their dashboards and other data visualizations.

In addition to this full-length guide, the accompanying Visualization Assessment Tool included in the Knowledge Base Article provides an easy reference guide to determine if your data visualization is meeting the minimum criteria to be considered equitable.

A few things to keep in mind when approaching this work:

- **These standards are a starting line.** We acknowledge that there are demographic variables and visualization tools not included. At this time, the standards cover race, ethnicity, and language (REaL), age, and sex assigned at birth in relation to commonly used visualization tools. As we continue to improve our data collection around other demographic identifiers and explore new ways of displaying data, these standards will be updated.

- **Demographic data is imperfect.** Individuals have complex identities, experiences, and histories. Therefore, trying to fit everyone into neat boxes is inherently imperfect work. It's important to try to be as accurate, person-centered, and intentional as possible when making decisions, while also acknowledging that there is no perfect way to do this.

- **See this as an opportunity to practice cultural humility**. We invite you to join us in the learning process of trying new things and knowing we might not get it right every time. This work will continue to evolve as we all increase our self-awareness of our own biases and perceptions.

- **Please contact equityinclusion@unchealth.unc.edu** if you have questions or need further information

OVERARCHING PRINCIPLES

In addition to the specific topic areas explored in the following sections, there are some overarching principles to consider when creating equitable data visualizations.

Accessibility

Creating visualizations that are accessible to all viewers is an important way to embed equity into analytics.

- **Colorblind-friendly color palettes** – When using color alone to differentiate between elements, use an online simulator to test for the colorblind friendliness of the palettes (such as Coolors, Color Blindness Simulator, Color Contrast Tester).
    -
    - Another option is to label data directly rather than using a legend to avoid reliance on colors alone (See Figure 1). This is especially important for data visualizations using the UNC Health brand colors, as they are not color-blind friendly, or data visualizations with more than about five colors (as those tend to no longer be accessible), such as the recommended color palettes we include in Appendix A.

Figure 1 - (Miller, 2020)

- **Labels** – Individuals with visual impairments may use screen readers to navigate online. This makes it incredibly important to use clear, descriptive titles and labels for graphs, axes, legends, and captions. It may be even more helpful to use a title that summarizes the main takeaways and to include a summary of the information on the visualization.

- **Fonts** (Typography) – Certain fonts are more accessible for reading than others. Some options include Arial, Times New Roman, Verdana, Tahoma, Helvetica, and Calibri.

- Use Accessibility tips/tools specific to the visualization software. Most software has guides for making visualizations accessible (such as Tableau or Excel).

Social Construction of Race and Ethnicity

Race and ethnicity are not inherent biological traits but are social constructions. These categories change over time and across boundaries (such as between countries) and are not constant or genetic. Despite being social constructions, this categorization system has had very real impacts on the treatment, history, and health trends of groups that have been historically

marginalized. The differences between groups are due to structural racism and discrimination rather than race itself. For more information, read the American Medical Association's stance (O'Reilly, AMA: Racism is a threat to public health, 2020).

Decenter Whiteness

When creating visualizations related to race, avoid making the non-Hispanic, White group the comparison group or "standard." When Whiteness is centered, it perpetuates a racial hierarchy by assuming this group's outcome is the aspirational goal for all other groups in closing the equity gap – which might not always be appropriate. This does not mean the outcomes of White patient groups should be ignored or never compared with other races, but rather how we do so should be intentional so as not to elevate Whiteness as the standard.

Some ways to decenter Whiteness include:

- Avoid creating a dichotomy of races – Don't use "White" vs. "non-White" or "people of color." Rather, disaggregate the "non-White" group to show the diversity amongst communities.

- When looking at a data set, consider other ways to set a standard rather than using White group outcomes. This could include using overall averages or organizational goals/measures of excellence. Below are two examples, Figure 2 uses state average as the comparison, and Figure 3 uses a vertical line which represents a set goal.

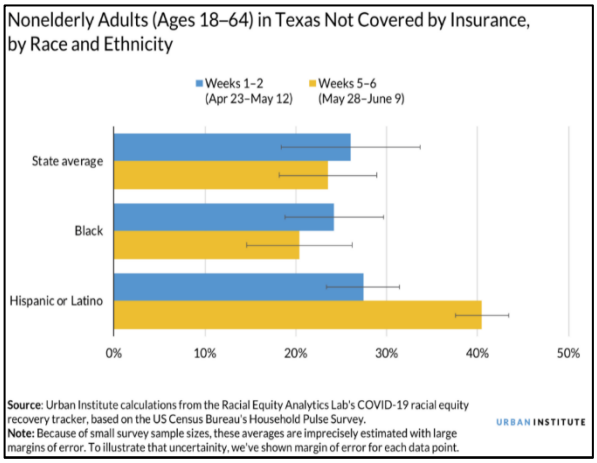

Figure 2 - (Urban Institute, 2020)

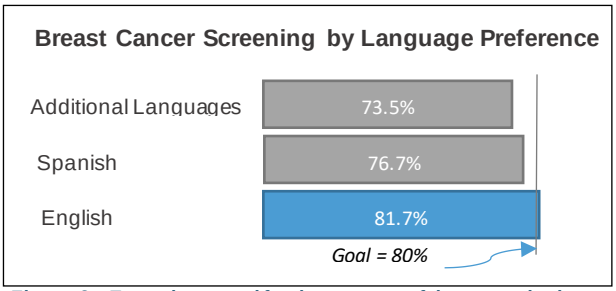

Figure 3 – Example created for the purpose of these standards

Stratifications vs. Filters

The two ways to incorporate demographic data into your dashboards are filters and stratifications. Filtering by a demographic category allows for the selection of a category, such as a particular racial community or age group, and then presents all data on that visualization for just that group (see Figure 4). This option can be easier to include in dashboards and can be a good starting point, however, it does not easily allow for comparison *between* groups.

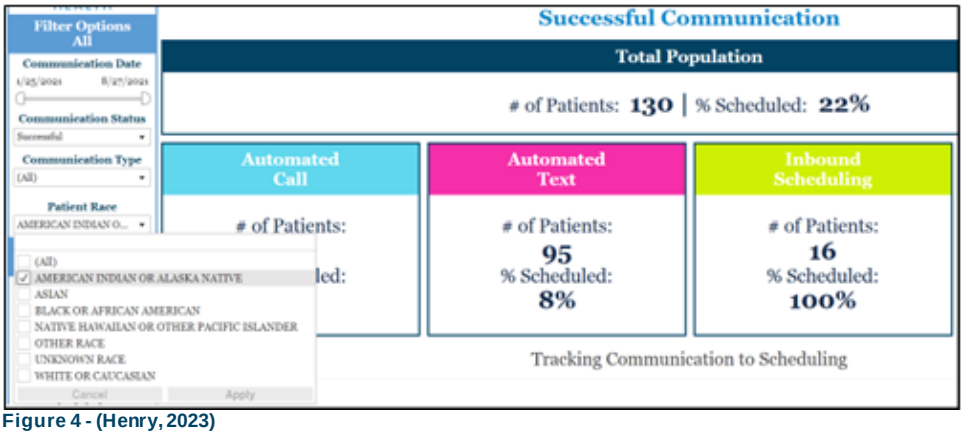

Figure 4 - (Henry, 2023)

Stratification visualizations allow for comparisons between groups by showing multiple categories in a single visualization and does not require toggling between filters (see Figure 5). This is generally the preferred way to display equity data because it allows disparities to be more easily identified.

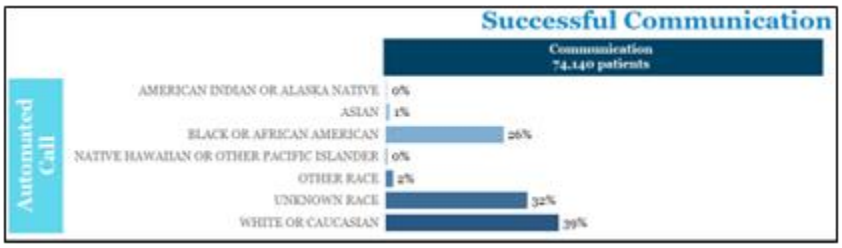

Figure 5 - (Henry, 2023)

Rates vs. Counts

The usage of rates (e.g., percent or per 1,000), instead or in addition to counts or raw numbers (e.g., # of patients), is needed to account for the smaller group sizes of historically marginalized groups compared to the non-Hispanic, White group. When possible, using rates instead of, or in addition to, counts is recommended.

Figures 6 and 7 demonstrate how using rates helps display disparities in maternal health outcomes compared to a simple count. Another option would be to include both the rate and count in a dashboard to account for both comparisons.

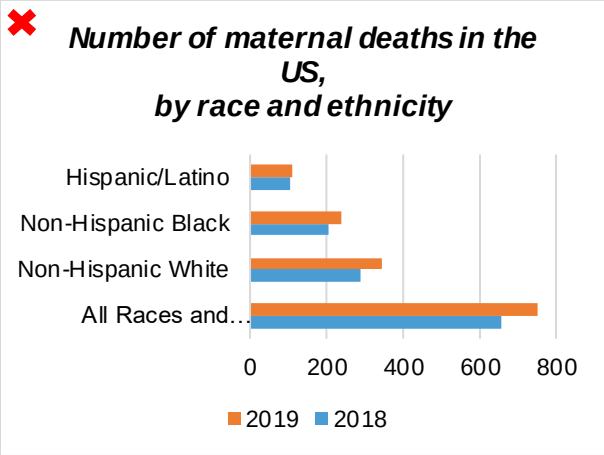

Figure 7 - (National Center for Health Statistics, 2019)

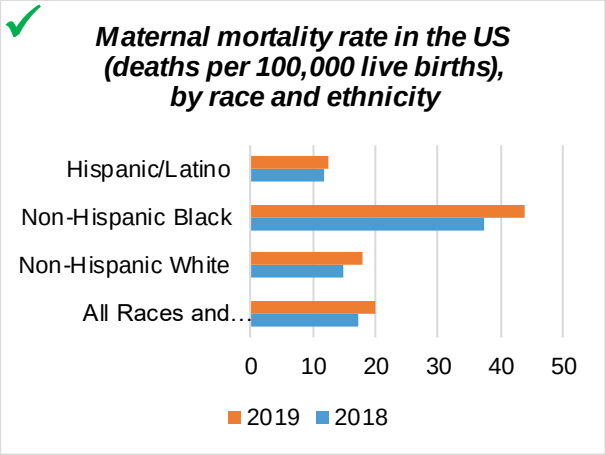

Figure 6 – (National Center for Health Statistics, 2019)

Intersectionality

Intersectionality is a framework that describes how multiple social and political identities within an individual overlap and interact to create greater oppression for some groups of people due to the combination of identities (e.g., being Black and a woman) (Crenshaw, 1989). This is important for data analysis because comparing data by race or gender may provide a different story than comparing by gender and race or gender and race and age. Using an intersectional approach provides granular data that allows one to tailor interventions to groups that need them most.

Keep this idea of intersectionality in mind when conducting data analysis and explore the interactions between multiple demographic variables to determine if there are any intersections worth highlighting or investigating further. Some examples of intersectionality are included below:

Teammate Example

Figure 8 demonstrates how experience of workplace micro-aggressions differ at the intersection of race, gender, and sexual orientation. For example, the section highlighted by the orange box reveals that 31% of all women report needing to provide more evidence of their competence than others, compared to 42% of Black women and 34% of Lesbian women.

Figure 8 - (Krivkovich, et al., 2018)

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Patient Example

Figure 9 demonstrates how lung cancer impacts differ at the intersection of race and gender. The data presented shows how Black men have the highest rate of death and Black women have the lowest.

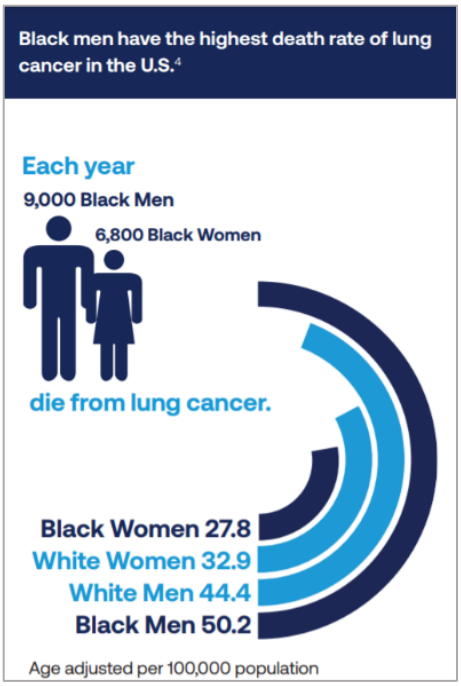

Figure 9 - (American Lung Association, 2020)

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GROUP CREATION

Determining which groups are included on a visualization determines which groups are "seen." This impacts the narrative that is centered, who is perceived as important, and how individuals see themselves represented (or not) in the data. To respect all groups, ideally, each individual group would be represented in a visualization. However, sometimes it is necessary to combine groups for reasons such as privacy concerns or statistical significance.

Combining Groups

Be cautious when combining groups, as lumping smaller groups together can lead to misrepresentative data and disguise vulnerabilities in certain communities. Additionally, when certain groups consistently go unacknowledged, it gives the impression that they lack value.

Below is some guidance to use when considering combining groups.

QUESTIONS TO CONSIDER BEFORE COMBINING GROUPS

- **Is important data/nuance lost by combining categories?**
  - Ensure there is not a meaningful difference in outcomes between groups that would be lost if combined.
- **Does the inclusion of uncombined data negatively impact the interpretation of the data visualization?**
  - Having too many groups can make visualizations cluttered and hard to interpret. Additionally, disaggregation leads to smaller group sizes, making comparisons to larger groups more difficult and making statistical significance more challenging. For that reason, it can sometimes be best to combine groups (and follow the best practices outlined below).
- **Does sharing uncombined data compromise patient health information (e.g., PHI or patient identity)?**
  - This will depend on the audience you are sharing the visualization with and what identifying information it contains. For example:
    - A dashboard available to a small clinical team displaying data on their patients to understand how a certain disease is connected to the age, sex and race of their patients. This would **not** be a privacy concern.
    - However, if that team wanted to make this available to a wider audience across the organization, many of whom were not involved in the patient's care and did not have a need to know their identity, then it would be recommended that the information be combined or masked to avoid any privacy breaches.
  - Typically, if you are sharing information beyond a clinical team working directly with the patients and have fewer than ten patients in a data group, you should strongly consider masking or combining that data to avoid privacy breaches. In these situations, it is recommended that you check with your leadership team and consult with the privacy office, if necessary, before widely sharing unmasked or uncombined data.
  - Look into your organization's privacy policy.

BEST PRACTICES WHEN CHOOSING TO COMBINE GROUPS

After considering the questions above, if you choose to combine groups, incorporate these best practices:

- Use "additional ____" when naming the combined group (such as "additional races" or "additional languages") rather than "other."
- Acknowledge who is not included in data & visualizations. Use tooltips or footnotes to explain what groups have been combined and why. Be transparent about dilemmas, compromises, and choices.
    - This is especially important given the recent Epic race and ethnicity changes, which have more options for patients that previously might have identified as "Pacific Islander," "Asian" or "Hispanic or Latino."
- If using Tableau, you can allow the user to bypass the decision you made to combine categories by offering a drill-down that shows the other categories (e.g., use the hover-over tooltip feature to see the details of the combined group).
    - Note: Before showing data for smaller groups, make sure it does not threaten the privacy of patient data. If you have fewer than 10 patients in a data group that you are considering leaving uncombined, it is recommended that you check with your leadership team and consult with the privacy office, if necessary.

Demographic Groups

Below is an overview of the demographic groups commonly used to stratify patient data. We've outlined the categories we recommend these groupings include and some additional things to keep in mind.

RACE

- American Indian/Alaskan Native
- Asian *(includes patients that identify as Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and Other Asian)*
- Black/African American
- Native Hawaiian or Other Pacific Islander *(includes patients that identify as Native Hawaiian, Guamanian, Samoan, and Other Pacific Islander)*
- White
- Multiracial (*includes any patient with multiple race fields that includes more than one race above*)
- Other Race
- Unknown (*includes blank, "Prefers not to answer" and "Unknown")*

Use the questions in the "Combining Groups" section above to determine if any racial groups should be combined or uncombined for the visualization. When analyzing a smaller pool of patients (i.e., entity, department, practice, clinic, etc.), there may be situations where certain races that have been combined above are more appropriate to leave uncombined.

ETHNICITY

- Hispanic, Latino/a, or Spanish Origin *(includes patients that identify as Mexican, Mexican American, Chicano/a, Puerto Rican, Cuban, Another Hispanic, Latino/a, or Spanish Origin)*
- Not Hispanic, Latino/a, or Spanish Origin
- Unknown *(includes blank, "Other," "Prefer not to answer," and "Unknown")*

When analyzing a smaller pool of patients (i.e., entity, department, practice, clinic, etc.), there may be situations where certain races that have been combined above are more appropriate to leave uncombined. Use the questions in the "Combining Groups" section above to determine if any racial groups should be uncombined for the visualization.

PREFERRED LANGUAGE

Patients have preferred languages that span hundreds of different languages. This diversity means that data visualizations cannot effectively display all preferred languages. This may differ for other organizations, but based on the current proportions of patient preferred language at UNC Health the following categories are recommended to be included in visualizations:

- English
- Spanish
- Additional Languages (*a combination of all other language categories)*

When analyzing a smaller pool of patients (i.e., entity, department, practice, clinic, etc.), there may be situations where languages other than English or Spanish are prevalent. In those situations, use the questions in the "Combining Groups" section above to guide your decision-making.

AGE

Age is derived in Epic based on the birthdate inputted into the system. As such, it is not already categorized like the other demographic variables. The U.S. Census age brackets can serve as a starting point for categorizing age. However, the appropriate age categories are best determined on a case-by-case basis. The categories should be adjusted based on the questions under study, what makes sense based on the nature of the clinical condition and taking into consideration any PHI concerns.

- Under five years
- 5 to 9 years
- 10 to 14 years
- 15 to 19 years
- 20 to 24 years
- 25 to 29 years
- 30 to 34 years
- 35 to 39 years
- 40 to 44 years
- 45 to 49 years
- 50 to 54 years
- 55 to 59 years
- 60 to 64 years
- 65 to 69 years
- 70 to 74 years
- 75 to 79 years
- 80 to 84 years
- 85 years and over

SEX ASSIGNED AT BIRTH

At UNC Health, the Sex Assigned at Birth field was recently added to the EMR. It currently needs to be more widely completed and therefore is not ready for use in data visualizations. Efforts are being made to improve this data collection, but we are recommending Gender (Male/Female/Other Gender/Unknown) be used in the interim.

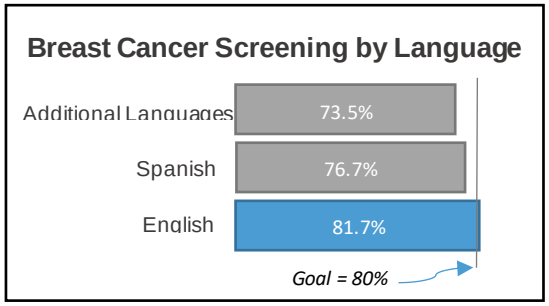
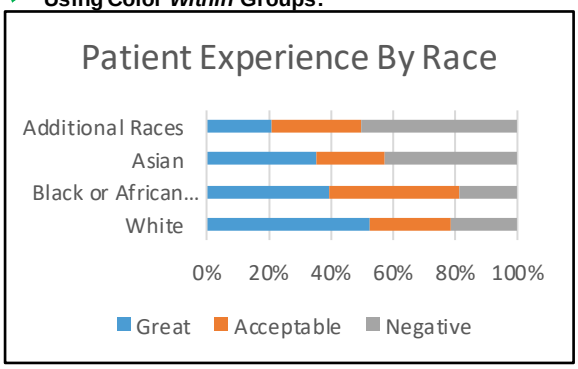
USE OF COLOR

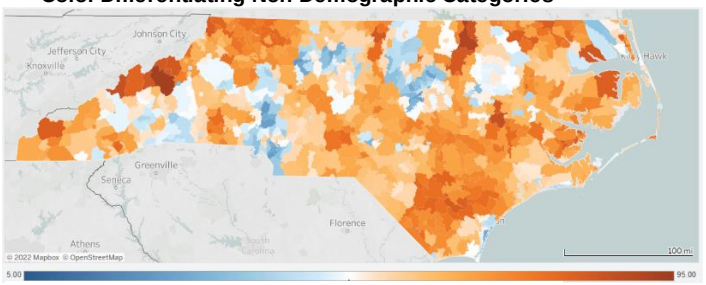
If not chosen intentionally, color palettes can perpetuate stereotypes and create a hierarchy across categories.

Not Using Color to Differentiate

Color should be used intentionally and does not always need to be used to differentiate between demographic groups. Not using color to differentiate between groups helps avoid unintentionally creating a hierarchy between groups, reinforcing stereotypes, or using non-colorblind-friendly palettes. Not using color to differentiate also enables color to instead be used to highlight group differences and assist with interpreting the data.

Examples of how to use color without differentiating between demographic groups:

Example	*Description*
✓ **Using Color to Highlight Disparities:**  **Figure 10 - Example created for the purpose of these standards**	Figure 10 shows a graph that uses color to highlight groups that have met a set goal, as opposed to differentiating between groups. In this example (using fabricated data), the goal is for 80% of patients to be screened for breast cancer, and it is stratified by language.
✓ **Using Color *Within* Groups:**  **Figure 11 - Example created for the purpose of these standards**	Figure 11 shows a graph that uses color to differentiate *within a* group, as opposed to differentiating *between* groups. In this example (using fabricated data), for each racial group, there is a different color representing the percentage of the group that reported great, acceptable, or negative experiences.

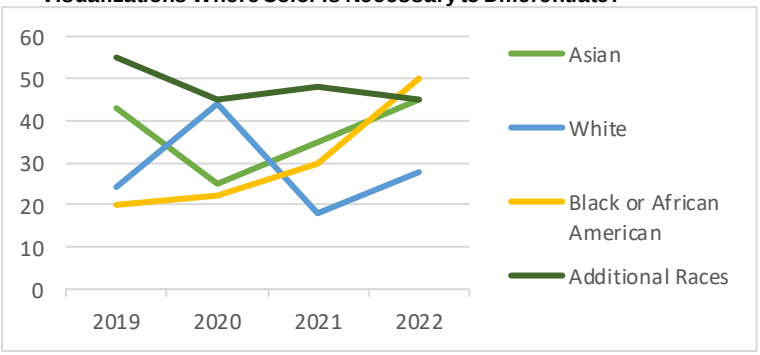
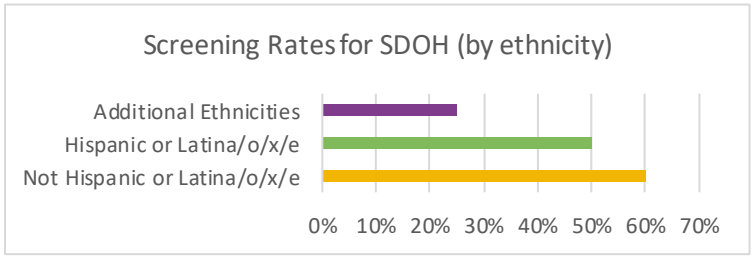
✓ **Color Differentiating Non-Demographic Categories**  **Figure 12 – Social Vulnerability Index**	This example from the Social Vulnerability Index developed by the CDC to support COVID-19 vaccine distribution demonstrates how color can be used to differentiate between geographic locations and across a quantitative scale.

Using Color to Differentiate

If color is determined to be necessary to differentiate between groups upon creating a visualization, the palette should be chosen carefully. Bold and contrasting, non-gradient color palettes are a best practice when displaying demographic data and incorporating color.

The recommended color palettes for when color is used to differentiate between stratified groups can be found in Appendix A, along with information on creating custom color palettes.

Examples of how and how not to use color to differentiate between groups:

Example	***Description***
✓ **Visualizations Where Color Is Necessary to Differentiate:**  **Figure 13 – Example created for the purpose of these standards**	For example, line graphs can be challenging to read and interpret when there is no color variation between lines. For this reason, it can be helpful to use color to differentiate between groups.
✗ **Visualizations Where Color Isn't Necessary to Differentiate:**  **Figure 14- Example created for the purpose of these standards**	For example, color is not necessary to differentiate between the groups when the bars are labeled on the axis.

LAYOUT SELECTION

Ordering data inherently implies a hierarchy across groups. When done incorrectly, ordering can perpetuate cycles of advantaging or centering certain communities while othering the rest.

Ordering

Quantitative Ordering

When ordering data in a visualization with categorical variables (such as race or language preference), use quantitative ordering. This technique ensures the layout is based on a numerical pattern rather than unconscious bias, habit, or historical patterns of who typically gets centered. However, keep in mind that this practice best promotes equity when combined with the recommendation to use rates over raw counts. Otherwise, quantitative ordering will continue to center the largest and more privileged group. *Continuous demographic variables, such as age, should be sorted quantitatively by the demographic variable.*

What To Do

✓ **Quantitative Ordering – Example:**

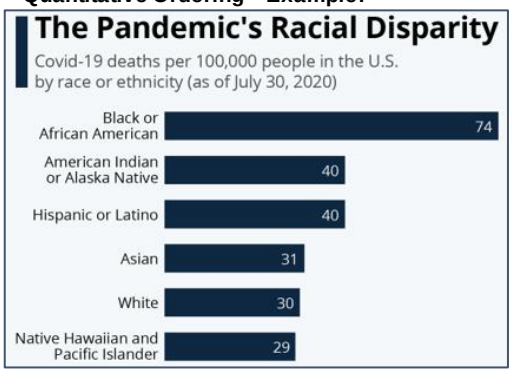


Figure 115 - (Statista, 2020)

✓ **Quantitative Ordering – Example:**

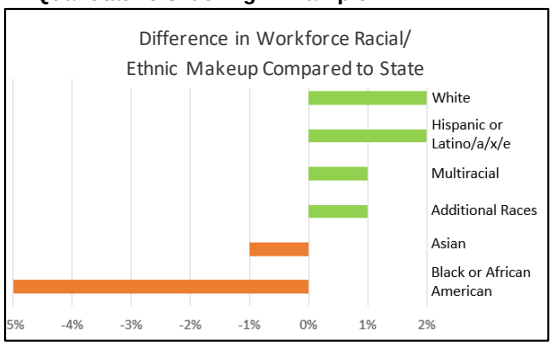


Figure 16 - Example created for the purpose of these standards

What Not To Do

✖ **Alphabetic Ordering – Example:**

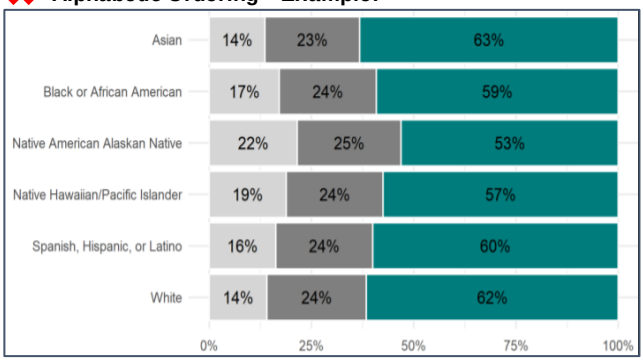


Figure 17 - (Press Ganey Associates LLC, 2021)

✖ **Centering Whiteness/Arbitrary Ordering – Example:**

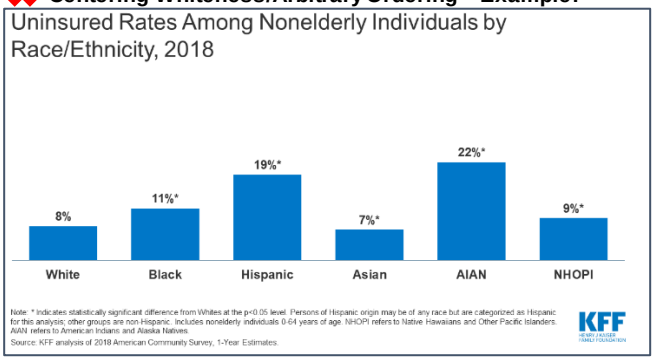


Figure 18 - (Artiga, Garfield, & Orgera, 2021)

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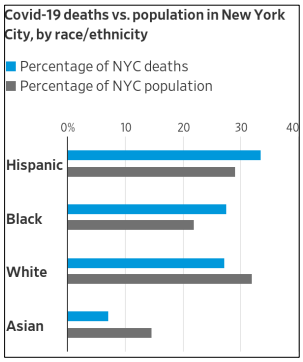
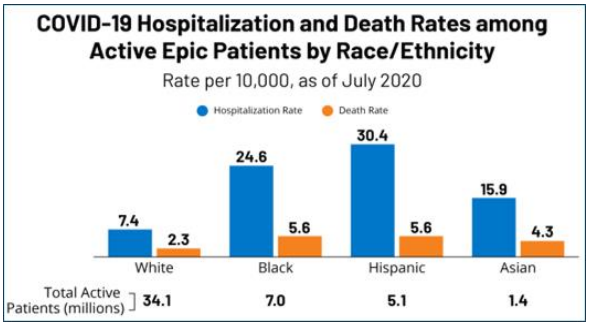
Ordering Multiple Variables

Sometimes, more than one numerical variable is incorporated into a visualization. When this occurs, developer discretion is needed to determine which variable to base the quantitative ordering on. When making this decision, consider which numerical value is more relevant to the story being told with the data or the trend/outcome that is most important to illustrate. For example, this often means ordering based on outcome rather than population.

What To Do	*What Not To Do*
✓ Ordered based on percentage of deaths. Example:  **Figure 19 - (Barrett, Jones, & Reed, 2020)**	✖ Ordered based on total active patients, which centers Whiteness. Instead, this should have been ordered based on hospitalization rates. Example:  **Figure 20 - (Rubin-Miller, Alban, Artiga, & Sullivan, 2020)**

TOOLTIPS / FOOTNOTES

Using the tooltip function when using Tableau or footnotes for other data visualization can add additional equity-related context.

If creating visualizations in Tableau, using the tooltip function to add context to visualizations is encouraged. To ensure it's easy for viewers to find information in the tooltips, turn them on by default or use other ways to signify to viewers that more information is available when hovering over certain aspects.

Examples of how tooltip can be used include:

- Providing context to nuanced topics (e.g., SDoH, the social construction of race, or the difference between gender and assigned sex).
  - Include definitions or links to outside sources that can provide more context [See Appendix B for some potential resources].

- Showing more detail when combining groups.
  - At a minimum, this should state what categories are included in the combined group. To provide more detail, include a visualization that drills down to the individual groups or states the numerical values (see Figure 21 for how visualization in the tooltip can provide another level of detail).
  - The level of detail provided in the drilldown should consider the impact of sharing the disaggregated numbers (i.e., patient privacy concerns). More information about making decisions about grouping can be found in the Categories section of this document.

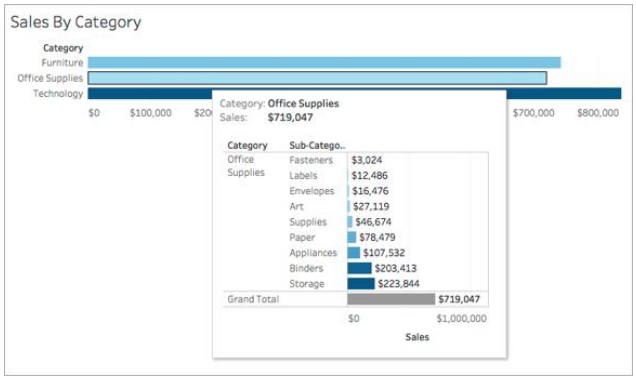


Figure 21 - (Tableau, 2021)

- Creating an Info button in the top corner of the screen is a way to provide more context or background information on your dashboard, including linking to another document with definitions or other important information. Figure 22, below, shows an example of an info button on an existing UNC Health dashboard, which is linked to an additional dashboard with related information.

Figure 22 - (Henry, 2023)

Visualizations outside of Tableau, such as Excel, reports, and presentations, should use footnotes to include crucial contextual information. Examples of how footnotes can be used include:

- Explaining what groups are included in a combined category (see Figure 23)
- Linking to external sources to learn more about a specific topic
- Provide additional contextual information

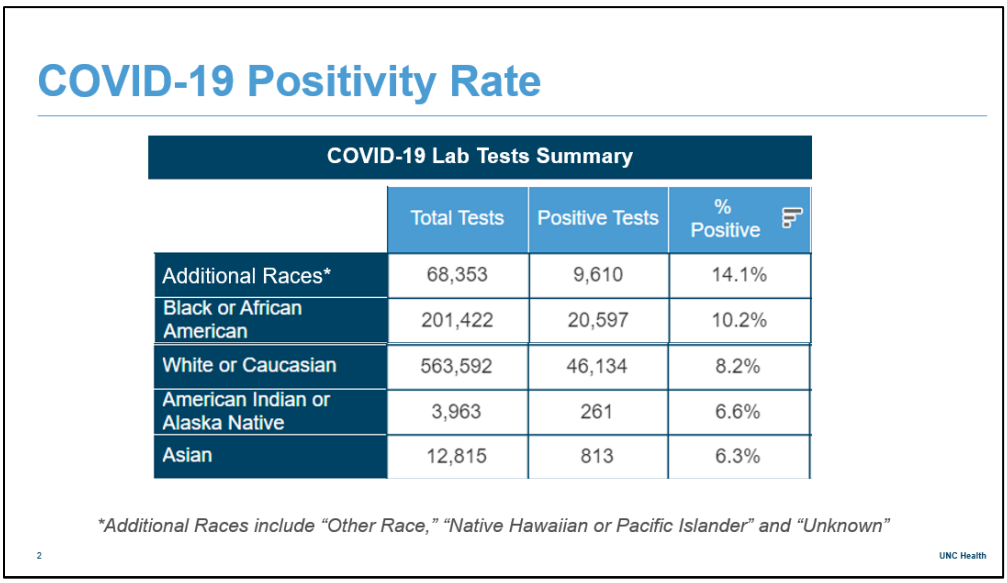


Figure 23 - Example PPT slide with fabricated data

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LANGUAGE CHOICE

Language is a meaningful way to show respect and thoughtfulness about the people connected to the data. Because the terms used to describe communities are constantly changing, this list is not static and will be updated and added to over time. This guide is not intended to be a checklist of correct answers but rather a starting point for intentional choices to avoid perpetuating harmful phrases in our work and considering alternative replacements.

For more information about language choice and a full glossary of related terms beyond the scope of these standards, visit the American Medical Association's resource title Advancing Health Equity: Guide to Language, Narratives and Concepts (American Medical Association, 2021).

Person-Centered Language

Person-centered language should be used, rather than language that objectifies individuals or communities by calling them names rather than naming their experiences. Person-centered language can be wordier but is also more accurate and respectful. For example, using "person with diabetes" instead of "diabetic" or "patient with a mental illness" instead of "mentally ill."

Because space on dashboards and visualizations is limited and person-centered language is often longer, find ways to incorporate the person-centered language in either the titles, footnotes, or tooltips if you cannot use it in the visualizations themselves. Below are a few examples.

Using Patient-Centered Language in Title:

Figure 24 – Example Created from (Henry, 2023)

Using Person-Centered Language in Tooltips:

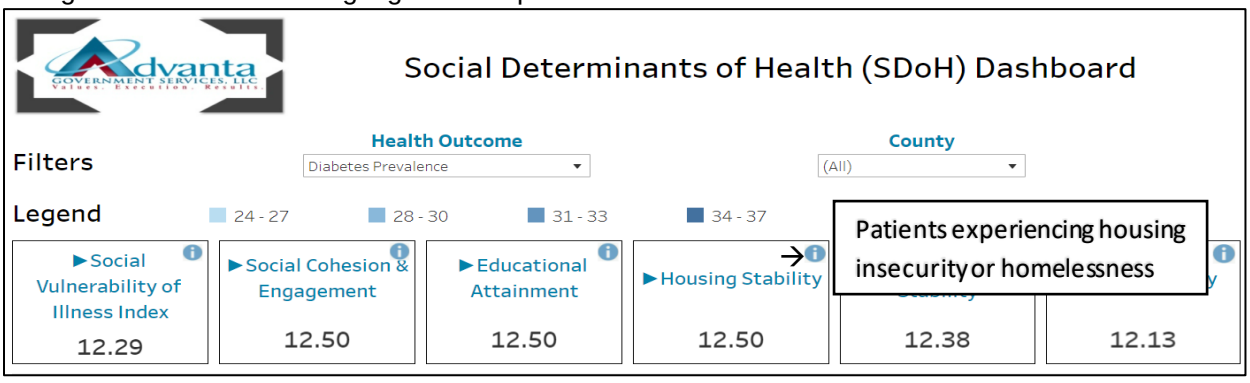

Figure 25 - Amended from (Welebob, 2021)

Click here to return to the top of the document

Avoid Patronizing Language

Some language historically used in the health field fails to consider the patient's agency and the various factors impacting their situation. Instead, language blames the patient and is viewed as patronizing. This language has also been used to uphold structural racism and discrimination, as it has disproportionately been used toward patients of color. Below are some examples of substitutions you can make to avoid patronizing and patient-blaming language:

Don't Use…	Instead, Use…
Non-Compliance	Non-adherence
No Show	Missed Visits

Demographic Descriptors

As much as possible, demographic descriptors should reflect the preferences of the communities it represents. This allows individuals to feel seen and respected. The definitions and explanations below are adapted from a combination of sources (American Heart Association, 2021; Thomas & Hirsch, 2016; Christiansen, Iverson, Flanagin, & et al., 2020)

Note: For consistency and clarity, the data descriptors should match the categories used during data collection. However, if the data source you're using has outdated language, this can be noted in tooltips or footnotes of your visualization.

RACE

- **American Indian/Alaskan Native** – To be used when referring to two or more people indigenous to the United States, with different or unknown tribal affiliations. Other acceptable alternatives are Native American or Indigenous (such as "the Indigenous people of the United States").

- **Asian –** Used to describe individuals of Asian descent. Sometimes, this category includes Pacific Islanders, but the racial categories UNC Health uses include those identifying as Pacific Islanders with Native Hawaiians. As of January of 2023, patients are now able to identify as Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and Other Asian.

- **Black/African American** – These terms aren't necessarily interchangeable. Black should be used as an adjective and not a noun (i.e., "Black people," not "Blacks"). Black should be capitalized to align with the capitalization of other racial and ethnic groups.

- **Multiracial** – Individuals that identify with more than one of the racial categories. Preferred over "mixed race."

- **Native Hawaiian or Other Pacific Islander** – Individuals with origins in Hawaii or other Pacific Islands. Sometimes, Pacific Islanders are included with Asian Americans, and

Native Hawaiians are included with other Indigenous communities. However, UNC Health's racial categories group the Native Hawaiian and Pacific Islander communities together. As of January 2023, patients are able to identify as Native Hawaiian, Guamanian, Samoan, or Other Pacific Islander.

- **Other Race** – Many individuals do not identify with any of the race options offered. Based on census studies, over 5% of the US population identifies as other races, 90% of whom identify with the ethnicity of Hispanic or Latino/a/x/e (Agency for Healthcare Research and Quality, 2018). This group is not the same as "unknown" but is a group of individuals who do not identify within the constructed boundaries of race the organization collects information on.

- **White –** White should be used as an adjective and not a noun (i.e., "White people," not "Whites"). White should be capitalized to align with the capitalization of other racial and ethnic groups.

ETHNICITY

- **Hispanic or Latino/a/x/e –** Hispanic or Latino/a/x/e is a panethnicity, or a consolidation of previously distinct groups into a single race or ethnicity (McConnell & Delgado-Romero, 2004). Because of this, many individuals that fall within this category identify more closely with their country of origin, and as of January 2023, patients can identify as Mexican/Mexican American/Chicano/a, Puerto Rican, Cuban, or Another Hispanic/Latino/a/Other Spanish Origin. There is currently no consensus on a single term that is inclusive of all ethnic and gender identities encompassed in this panethnicity. As a result, "Hispanic or Latino/a/x/e" is the most inclusive way to reflect this ethnic community. It represents an abbreviation of Hispanic or Latino/Latina/Latinx/Latine.
  - To learn more, you can watch a presentation from Liliana Madrid (Director of Diversity, Equity and Inclusion at NC State) hosted by UNC's SALUD Employee Resource Group in 2021 that discussed the history and complexity of this terminology (Madrid, 2021).

LANGUAGE

- _____ **Language Preference** – When referring to a patient group that speaks a language, use this framework to be patient-centered (i.e., "patients with a Spanish language preference"). This acknowledges that it is up to the patient to determine their preference for how they want to be communicated with, and not up to the staff to assess what language concordant support they do or do not require.

AGE

- **Young People/Youths** – The preferred term when referring to a group of younger individuals (generally those under 18). Another alternative is "people under X," which allows for more specificity.

- **Older Adults** – The preferred term over others, such as "the elderly" or "seniors." Another alternative is "people over X," which allows for more specificity.

GENDER/SEX

- **Assigned Sex** – Our current data is limited to capturing assigned sex (i.e., assigned sex at birth) rather than gender identity, so use this term when presenting this data. More direction on gender identity will be included in future versions of this document.

OTHER TERMINOLOGY

- **Community** – When referring to a group within the data, use "community." This implies a sentiment of shared culture and is more person-centered than other alternatives (i.e., group, population).

- **Historically Marginalized Community/Communities** – Preferred over terms such as "minority." The use of "historically" acknowledges that while progress has been made, these groups are still impacted by the history of generations of disenfranchisement and marginalization. It also recognizes that the goal is for these groups not always to be marginalized or disenfranchised.

- **People of Color/Communities of Color/BIPOC (Black, Indigenous, People of Color)** – Acceptable in some situations, but should be avoided when it's possible to replace with more specific descriptions/categories (i.e., listing out the races included).

Questions To Ask Yourself

The previous guidelines might not cover all scenarios, so when you need to decide on the language to use, ask yourself the following questions (Adapted from (American Friends Service Committee, 2019)):

1. **Do the words seek to fix, blame, shame, or change our and communities that are most marginalized, OR do they seek to address the oppressive systems that impact these patients and their communities?**

2. **Are the words racialized?** Do the terms have a racist or colonialist implication? (An example is the phrase "at risk." Close your eyes and say the phrase "at risk." Does a picture of a patient group or community come to mind? If so, stop and pick another word.)

3. **Is the language centering the patient? Or do the phrases objectify patients or communities?** Distinguish between calling patients and communities a name and describing what they are experiencing.

4. **How am I framing the words?** What is the context and culture we are creating and perpetuating by using the words? Are the words positioning the patients and communities we serve to live in their personal and collective power while addressing systemic oppression?

5. **Do the words dehumanize the patients and communities we serve?** Words that take away agency, self-determination, and personal power and do not recognize our patients' and communities' inherent strengths and assets should be avoided.

GEOGRAPHIC VISUALIZATIONS/MAPPING

Geographic visualizations, or maps, can be a powerful way of representing data. They allow for the visualization of resources, barriers and disparities across the communities we serve. For example, maps can be used to visualize the relationship between grocery store access and community racial makeup (Ladipo, 2021) (see Figure 26) or maternal risk in counties across the country (Sgaier, Downey, Nguyen, & Serkez, 2021) (see Figure 27). We encourage you to click on the links to experience the interactive nature of these examples.

Figure 26 - (Ladipo, 2021)

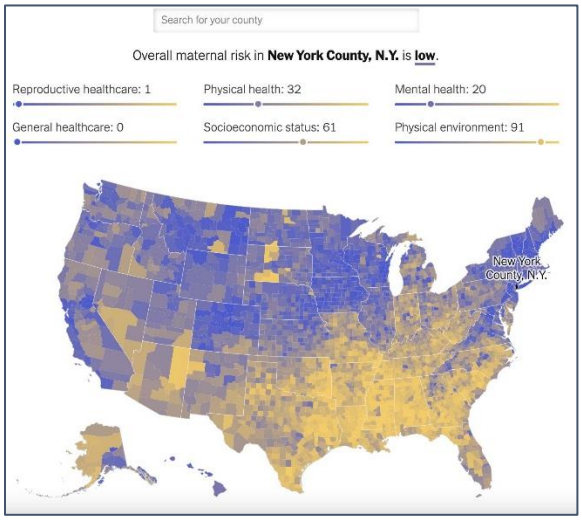

Figure 27 - (Sgaier, Downey, Nguyen, & Serkez, 2021)

Like any other visualization, best practices apply to ensure equity is embedded. Some things to keep in mind:

- **Geography Choice** – Selecting what geography you use to visualize data (such as zip codes, census tract, flu regions, etc.) will depend on the data being analyzed. However, analysts need to keep in mind that this choice can impact the equity of the visualization.
    - For example, zip codes may be convenient and readily available, but they represent expedient routes for postal delivery, not "natural" communities. This can cause analysis that disguises disparities (such as this example in Flint (Sadler, 2019)). Therefore, using Census Tract instead may be more appropriate in many situations.

- **Patient Privacy** – Splitting data into smaller geographic groups can pose increased threats to patient privacy, especially if also filtering by demographic characteristics.
    - Be sure to mask data that could expose protected patient information. Typically, any fewer than ten patients need to be masked. Still, it may be more depending

on the situation and audience, so be sure to consult with your leadership or the privacy office if necessary.

- However, just because you need to mask data does not mean you should not still acknowledge the group with which the data is associated with. See Figure 28 below for an example.

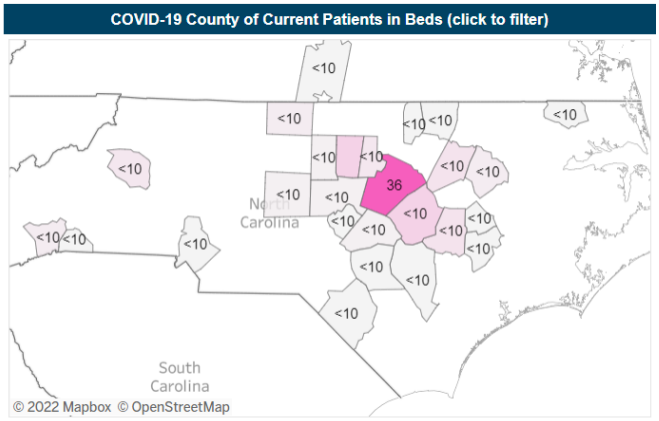

Figure 28 – UNC Health COVID-19 Dashboard

- **Color Choice** – Color is often necessary to show differences in a geographic visualization because of that:
  - When possible, ensure the palette you choose is color-blind friendly (use resources like Coolors, Color Blindness Simulator, or Color Contrast Tester).
  - Be intentional about the color choice to avoid choosing colors that perpetuate stereotypes.

- **ToolTips/Footnotes** – As with any other visualization, ToolTips in Tableau or creating footnotes in other software, are a good way to add additional context or nuance to a visualization that has limited space for words. You can use these to add insight into the data source or why certain decisions were made in the development of the visualization.

ACKNOWLEDGMENTS

Standard Development Team

These standards were developed in 2022 by UNC Health's Equity & Inclusion Analytics Workgroup. This workgroup is co-led by the Equity & Inclusion (E&I) Department and Information Services Division Enterprise Analytics Data Science (ISD EADS). The workgroup includes teammates from across UNC Health and UNC Chapel Hill.

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Evan Galloway	UNC Chapel Hill: Sheps Center for Health Services Research
Taylor Holloway	UNC Health: Research Integration Team
Anna Jojic	UNC SOM: North Carolina Translational and Clinical Sciences (NC TraCS) Institute
Dr. Michael Kane	UNC SOM: Department of Psychiatry
Greg Kuhnen	UNC Health: ISD EADS
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Larry Mandelkehr	UNC Health: Hospital Quality and Innovation
Rachini Moosavi	UNC Health: ISD EADS
Deepak Nagandla	UNC Health: Onslow, Clinical Quality Analytics
Mounika Pavuluri	UNC Health: Human Resources, Data Management
Aleyah Pryor-Pankey	UNC Health: E&I Department
Dr. Amy Shaheen	UNC Health Alliance
Crystal Walker	UNC Health: Research Integration Team
Eleanor Wertman	UNC Health: Population Health

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Land and Labor Acknowledgements

UNC Health's services span the state of North Carolina, which resides on the ancestral homelands of many indigenous peoples. Overtime many tribes have called this land home, including the tribes/nations: Bear River, Cape Fear, Catawba, Cheraw, Cherokee/Eastern Band of Cherokee, Chowanoke, Coharie, Coree, Croatan/Lumbee, Eno, Haliwa-Saponi, Hatteras, Keyauwee, Machapunga, Meherrin, Moratoc, Neuse River, Occaneechi, Pamlico, Sappony Saxpahaw, Secotan, Shakori, Sissipahaw, Sugeree, Tuscarora, Tutelo, Waccamaw-Siouan, Wateree, Waxhaw, Weapemeoc, Woccon, and Yeopim (NC Museum of History, 2022). Many of these tribes and their members were driven from the land by White settlers from Europe through force and land theft.

The state of North Carolina, which UNC Health serves, also has a history of labor theft. For over 400 years over a million people, descendent from ancestors kidnapped from Africa, were forced into slave labor across North Carolina.

Our country and state's history of stolen land and labor has far reaching implications, including on the health access and outcomes of the decedents of those who were subjected to those injustices. These historic injustices must be recognized in the process of embedding health equity across UNC Health, including into data and analytics.

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APPENDIX A – COLOR PALETTES

The color palettes below were developed for UNC Health employees, and are only recommended for when color is used to differentiate between demographic groups. (A current limitation of these color palettes is that because some of the categories have more than five groupings, we could not make them color-blind friendly. Please reference the Accessibility section for more information.)

To assign custom color palettes in Tableau, editing the Preferences.tps file is required. To learn more about how to create custom color palettes in Tableau, click here.

Note: HEX Codes = Hexadecimal Color Codes, which are values that tell the computer/web display how much of a color to show. RGB stands for red, green, and blue and is a color model that adds those primary colors together based on the values to create a broad spectrum of colors.

Race

PATIENTS:

Category	Color	Hex Code	RGB
American Indian/Alaskan Native		#CA73C6	202, 115, 198
Asian		#11A579	17, 165, 121
Black/African American		#F2B701	242, 183, 1
Native Hawaiian or Other Pacific Islander		#D05D02	208, 93, 2
White		#F97B72	249, 123, 114
Other Race		#3969AC	57, 105, 172
Multiracial		#4B4B8F	75, 75, 143
Unknown		#AEAAAA	174, 170, 170
Additional Races (*use when combining groups*)		#7F3C8D	127, 60, 141

TEAMMATES:

Category	Color	Hex Code	RGB
American Indian or Alaskan Native		#CA73C6	202, 115, 198
Asian (not Hispanic or Latino)		#11A579	17, 165, 121
Black or African American (not Hispanic or Latino)		#F2B701	242, 183, 1
Hispanic or Latino		#80BA5A	128, 186, 90
Native Hawaiian Or Other Pacific Islander		#D05D02	208, 93, 2
White (not Hispanic or Latino)		#F97B72	249, 123, 114
Not Specified		#AEAAAA	174, 170, 170
Two or More Races (not Hispanic or Latino)		#4b4b8f	75, 75, 143
Additional Races (*use when combining groups*)		#7F3C8D	127, 60, 141

Ethnicity

PATIENTS:

Category	Color	Hex Code	RGB
Hispanic, Latino/a or Spanish Origin		#80BA5A	128, 186, 90
Not Hispanic, Latino/a or Spanish Origin		#F2B701	242, 183, 1
Unknown		#AEAAAA	174, 170, 170
Prefer not to answer		#F97B72	249, 123, 114
Other		#3969AC	57, 105, 172
Additional Ethnicities *(use when combining groups)*		#7F3C8D	127, 60, 141

TEAMMATES: *Included in the race in section above*

Preferred Language

PATIENTS AND TEAMMATES:

Category	Color	Hex Code	RGB
English		#80BA5A	128, 186, 90
Spanish		#E68310	230, 131, 16
Additional Languages *(use when combining groups)*		#7F3C8D	127, 60, 141

Assigned Sex (e.g., Assigned sex at birth)

PATIENTS AND TEAMMATES:

Category	Color	Hex Code	RGB
Male		#80BA5A	128, 186, 90
Female		#E68310	230, 131, 16
Unknown or unspecified		#7F3C8D	127, 60, 141

Age

Since age is a qualitative demographic characteristic, a sequential color palette can be used. When choosing a color scheme, do not select one that includes grey as that can contribute to stereotypes about aging.

APPENDIX B – HEALTH EQUITY RESOURCES AND LINKS

Below are some links to get a deeper dive into health equity topics. These resources can be included as links, when relevant, in dashboards or other visualizations to give your audience more context on nuanced topics.

- What is Health Equity? (Health Equity Institute, 2014)
- Social Determinants of Health
  - Social Determinants of Health 101 for Health Care (Magnan, 2017)
  - About Social Determinants of Health (Center for Disease Control, 2021)
- Assigned Sex Vs. Gender Identity (Planned Parenthood, 2022)
- Social Construction of Race (O'Reilly, AMA: Racism is a threat to public health, 2020)

REFERENCES

Agency for Healthcare Research and Quality. (2018, April). *Race, Ethnicity, and Language Data: Standardization for Health Care Quality Improvement*. Retrieved from Agency for Healthcare Research and Quality: https://www.ahrq.gov/research/findings/final-reports/iomracereport/reldata3.html

American Friends Service Committee. (2019, March 29). *Anti-racist decolonizing framework for talking about and describing young people.* Retrieved from afsc: https://www.afsc.org/resource/anti-racist-decolonizing-framework-talking-about-and-describing-young-people

American Heat Association. (2021, May). *Structural Racism and Health Equity Language Guide.* Retrieved from American Heart Association: https://professional.heart.org/-/media/phd-files-2/science-news/s/structural_racism_and_health_equity_language_guide.pdf?la=en

American Lung Association. (2020). *State of Lung Cancer.* Retrieved from https://www.lung.org/research/state-of-lung-cancer/racial-and-ethnic-disparities

American Medical Association. (2021). *Advancing Health Equity: Guide to Language, Narrative and Concepts.* Retrieved from American Medical Association: https://www.ama-assn.org/system/files/ama-aamc-equity-guide.pdf

Artiga, S., Garfield, R., & Orgera, K. (2021, April 7). *Communities of Color at Higher Risk for Health and Economic Challenges due to COVID-19.* Retrieved from Kaiser Family Foundation: https://www.kff.org/coronavirus-covid-19/issue-brief/communities-of-color-at-higher-risk-for-health-and-economic-challenges-due-to-covid-19/

Barrett, J., Jones, C., & Reed, E. (2020, April 8). *Mayors Move to Address Racial Disparity in Covid-19 Deaths.* Retrieved from The Wall Street Journal: https://www.wsj.com/articles/black-hispanic-new-yorkers-account-for-disproportionate-number-of-coronavirus-deaths-11586359447

Bianchi, F. (n.d.). *Coolors*. Retrieved from https://coolors.co/

Carrasco, M. X. (2020, February 13). *'Hispanic' Preferred Over 'Latinx' By Hispanics When Describing Ethnicity.* Retrieved from ThinkNow: https://thinknow.com/blog/hispanic-preferred-over-latinx-by-hispanics-when-describing-ethnicity/

Center for Disease Control. (2021, March 10). *About Social Determinants of Health (SDOH).* Retrieved from Center for Disease Control: https://www.cdc.gov/socialdeterminants/about.html

Centers for Disease Control and Prevention. (2022). *Health Equity*. Retrieved from CDC: https://www.cdc.gov/healthequity/index.html

Christiansen, S., Iverson, C., Flanagin, A., & et al. (2020). *AMA Manual of Style: A Guide for Authors and Editors. 11th Ed.* https://www.amamanualofstyle.com/: Oxford University Press.

Crenshaw, K. (1989). Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. *University of Chicago Legal Forum*.

Health Equity Institute. (2014, December 02). *What is Health Equity?* Retrieved from https://www.youtube.com/watch?app=desktop&v=ZPVwgnp3dAc

Henry, R. (2023). *COVER NC Dashboard - Vaccine Communication.* Retrieved from UNC Health Alliance - Tableau: https://insights.unch.unc.edu/#/site/UNCHCS/views/COVERNCDashboard/VaccineCommunication?:iid=3

Krivkovich, A., Nadeau, M.-C., Robinson, K., Robinson, N., Starikova, I., & Yee, L. (2018). *Women in theWorkplace 2018.* McKinsey.

Madrid, L. (2021). *UNC Health - SALUD ERG; Hispanic Heritage Month 2021*. Retrieved from UNC Health Intranet - Office of Diversity Equity and Inclusion: https://unchcs.intranet.unchealthcare.org/dept/DEI/resources/Pages/HispanicHeritageMo2021.aspx

Magnan, S. (2017, October 09). *Social Determinants of Health 101 for Health Care: Five Plus Five.* Retrieved from National Academy of Medicine: https://nam.edu/social-determinants-of-health-101-for-health-care-five-plus-five/

McConnell, E. D., & Delgado-Romero, E. A. (2004). Latino Panethnicity: Reality or Methodological Construction? *Sociological Focus*, pp. 297-312.

Miller, A. (2020, November 02). *A Comprehensive Guide to Accessible Data Visualization.* Retrieved from Betterment: https://www.betterment.com/design/accessible-data-visualization

Nandeshwar, D. A. (n.d.). *Pie Chart Vs Bar Chart.* Retrieved from Nandeshwar.info: https://nandeshwar.info/data-visualization/pie-chart-vs-bar-chart/

National Center for Health Statistics. (2019). Mortality. *National Vital Statstics System*.

NC Meseum of History. (2022, January 19). *North Carolina American Indian History Timeline*. Retrieved from NC Meseum of History: https://www.ncmuseumofhistory.org/american-indian/handouts/timeline

Noe-Bustamante, L., Mora, L., & Lopez, M. H. (2020, August 11). *About One-in-Four U.S. Hispanics Have Heard of Latinx, but just 3% Use It.* Retrieved from Pew Research Center: https://www.pewresearch.org/hispanic/wp-content/uploads/sites/5/2020/08/PHGMD_2020.08.11_Latinx_FINAL.pdf

O'Reilly, K. B. (2020, November 16). *AMA: Racism is a threat to public health.* Retrieved from American Medical Association: https://www.ama-assn.org/delivering-care/health-equity/ama-racism-threat-public-health

O'Reilly, K. B. (2020, November 16). *AMA: Racism is a threat to public health.* Retrieved from American Medical Association: https://www.ama-assn.org/delivering-care/health-equity/ama-racism-threat-public-health

Planned Parenthood. (2022). *Sex and Gender Identity.* Retrieved from Planned Parenthood: https://www.plannedparenthood.org/learn/gender-identity/sex-gender-identity

Press Ganey Associates LLC. (2021). *6 Things You Need To Know About Analyzing Patient Experience Scores by Race and Ethnicity.* Retrieved from Press Ganey Equity Partnership: https://images.healthcare.pressganey.com/Web/PressGaneyAssociatesInc/%7Bca972d19-0c68-408c-98a0-81e406e52839%7D_2021_08_17_DEI_Webinar_Slides.pdf?elqcst=272&elqcsid=3204

Rubin-Miller, L., Alban, C., Artiga, S., & Sullivan, S. (2020, September 16). *COVID-19 Racial Disparities in Testing, Infection, Hospitalization, and Death: Analysis of Epic Patient Data.* Retrieved from Kaiser Family Foundation: https://www.kff.org/report-section/covid-19-racial-disparities-in-testing-infection-hospitalization-and-death-analysis-of-epic-patient-data-issue-brief/

Statista. (2020, July 30). *The Pandemics Racial Disparities.* Retrieved from Statista: https://www.statista.com/chart/22430/coronavirus-deaths-by-race-in-the-us/

Tableau. (2021). *Create Views in Tooltips (Viz in Tooltip)*. Retrieved from Tableau: https://help.tableau.com/current/pro/desktop/en-us/viz_in_tooltip.htm

Thomas, H., & Hirsch, A. (2016). *A Progressive's Style Guide.* Retrieved from Sum of Us: https://s3.amazonaws.com/s3.sumofus.org/images/SUMOFUS_PROGRESSIVE-STYLEGUIDE.pdf

U.S. Census Bureau. (2020). American Community Survey - 1-Year Estimates.

UNC Health. (2021). COVER NC Dashboard. North Carolina.

Urban Institute. (2020, July 1). *The COVID-19 Crisis Continues to Have Uneven Economic Impact by Race and Ethnicity.* Retrieved from Urban Institute: https://www.urban.org/urban-wire/covid-19-crisis-continues-have-uneven-economic-impact-race-and-ethnicity

Welebob, J. (2021, Nov 15). *sdoh new datastream.* Retrieved from Tableau Public: https://public.tableau.com/app/profile/joshua.welebob/viz/sdohnewdatastream/New