

Homework #3

Qu. 2 – Design Critique & Redesign

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PART A – Design Critique

1. Who is the audience?

- **General Public/Magazine Readers:** The audience for this visualization appears to be very broad and non-academic/professional – essentially in keeping with the audience for the magazine in which it was published (Wired). I am reaching this conclusion because the data presented in the visualization is very high level, and largely only useful for understanding the general patterns/trends (i.e., injuries are the least common cause of the 3 broader categories). However, there is little statistical data presented in relation to specific numerical allocation across different categories and sub-categories.
- **Policy Makers/Workers:** Notwithstanding the above, an additional audience could be policy makers. I suggest this, because the visualization could be useful to them from a high level perspective in understanding the rough distribution of deaths across categories, or potentially changes in categories in recent years (which may be relevant for policy decisions).
- **At Risk Populations:** Additionally, a key audience is likely at risk populations, in order to help them understand the risk of certain behaviors. For instance, seeing the high prevalence of heart disease, stroke and cancer may influence at risk populations to curb behaviors known to contribute to those conditions, such as stress, smoking, drugs and drinking alcohol. Similarly reasoning would apply for dangerous drivers in relation to “Road Accidents”, etc.

2. What questions does this visualization answer? (name at least 3)

- What is the high level distribution among the 3 major categories of causes of untimely causes of death? i.e., among Injuries, Non-Communicable, and Infectious Diseases & Birth Problems.
- What is the high level distribution among the many sub-categories within the 3 major categories of untimely causes of death? What is the approximate annual percentage chance amongst those sub-categories?
- At a high level roughly what proportion of deaths by Non-Communicable Diseases are caused by Cancer?

3. What data is represented in the visualization? Be specific and comprehensive.

- a) **Category Breakdown:** a representation of the 3 major categories of causes of untimely death (i.e., Non-Communicable, and Infectious Diseases & Birth Problems).
- b) **Subcategories Breakdown:** a representation of the many subcategories of causes of untimely

death grouped into the major categories. Cancer is further broken out as its own cohort within the subcategories.

- c) **Breakdowns:** a breakdown/distribution of the major categories and subcategories based on which causes are responsible for the untimely deaths based on years of life lost prematurely.
- d) **Change:** a breakdown of which of the subcategories have changed (i.e., decreased/increased). the most between 2005-2010.
- e) **Highlights:** Certain data is represented by way of a written explanation (as Tufte suggested) in order to highlight data relating to war, natural disaster, heart disease & stroke, etc.

4. For each data type, describe how it is encoded in the visualization using Bertin's marks and channels? (e.g., color saturation (channel) encodes annual percentage of change between 2005 and 201).

a, b & c - Categories & Subcategories Breakdown: are encoded using the following marks and channels:

- Position (they're grouped together, by lines and placement);
- Color, with one for each of the 3 major categories; and
- Size and shape (then size) in lines, shapes and colors.

b, c, & d - Subcategories Breakdown & Change: in addition to the (Grey) Value and color saturation encoded the percentage annual change (noted in the question), the Cancer subcategories are encoded by a position, shape and color with the blue rectangular shape that encompasses them.

e - Highlights: these data are encoded using a combination of shape, line, position and orientation (they aren't tilted), in order to call out their importance.

5. How are the perceptual channels contrast and color used in the visualization? Name at least two potential problems.

While there is no use of the Motion perceptual channel, the visualization does rely heavily on contrast and color to convey the story. Color and contrast are used most fundamentally to distinguish between the 2 major categories of causes of death. Additionally, contrast and hues are used to distinguish between the subcategories within each of those categories.

- **Problem 1 - Contrast/Hue:** As a result of using a single color and related hues for each of the 3 top level categories, there are some subcategories which are hard to distinguish from neighboring subcategories on the visualization – both in terms of the actual subcategory and in terms of whether year over year changes among attendees.
- **Problem 2 - Orientation:** As with the titled pie chart shown from the Apple presentation in lecture 2, this visualization is also titled and that skews the perception of the size of several of the subcategories, and to an extent the major categories as well. A flat/vertical visualization would have reduced this perceptual problem.

6. How are Tufte's design principles used or violated in this chart?

Usages:

- *Integrity*: and specifically, *writing out explanations/labels*, for highlighting important information (such as the callout relating to Malaria)
- *Layering & Separation (Gestalt too)*: a combination of linked colors and shaped have been utilized to tell the story, both in terms of breakdown and change over time.

Violations

- *Graphical Integrity – Avoid Distortion*: the fact that the slide is titled huts the visualization integrity.
- *Low data to ink ratio*: the space and data to ink ration could have been used more effectively to convey some technical details – for instance with a vertical/flat bar chart and used during the in-class example (which would have increased the Data Ink Ratio.
- *Using discouraged hue levels* (especially green & yellow), and

Part B – Redesign

1. *Sketch multiple re-designs of the visualization. The re-designs should address the three questions*

Question 1 – Breakdown by %: what is the percentage breakdown among the three categories, as well as each subcategories relative to both the overall total their parent major category.

Question 2 – Lives Lost: what is the amount of live lost to any of the 3 major categories or each of the subcategories.

Question 3 – Major Category Change: akin to the change denoted by subcategory, what is the overall change by category between 2005 to 2010.

Question 3 - Custom Totals: Based on a custome selection of categories or sub-categories, what is the % or amount of lives lost, as well as the overall change between 2005-2010.

Please see attached re-designs

Redesign
①

change &
* totals

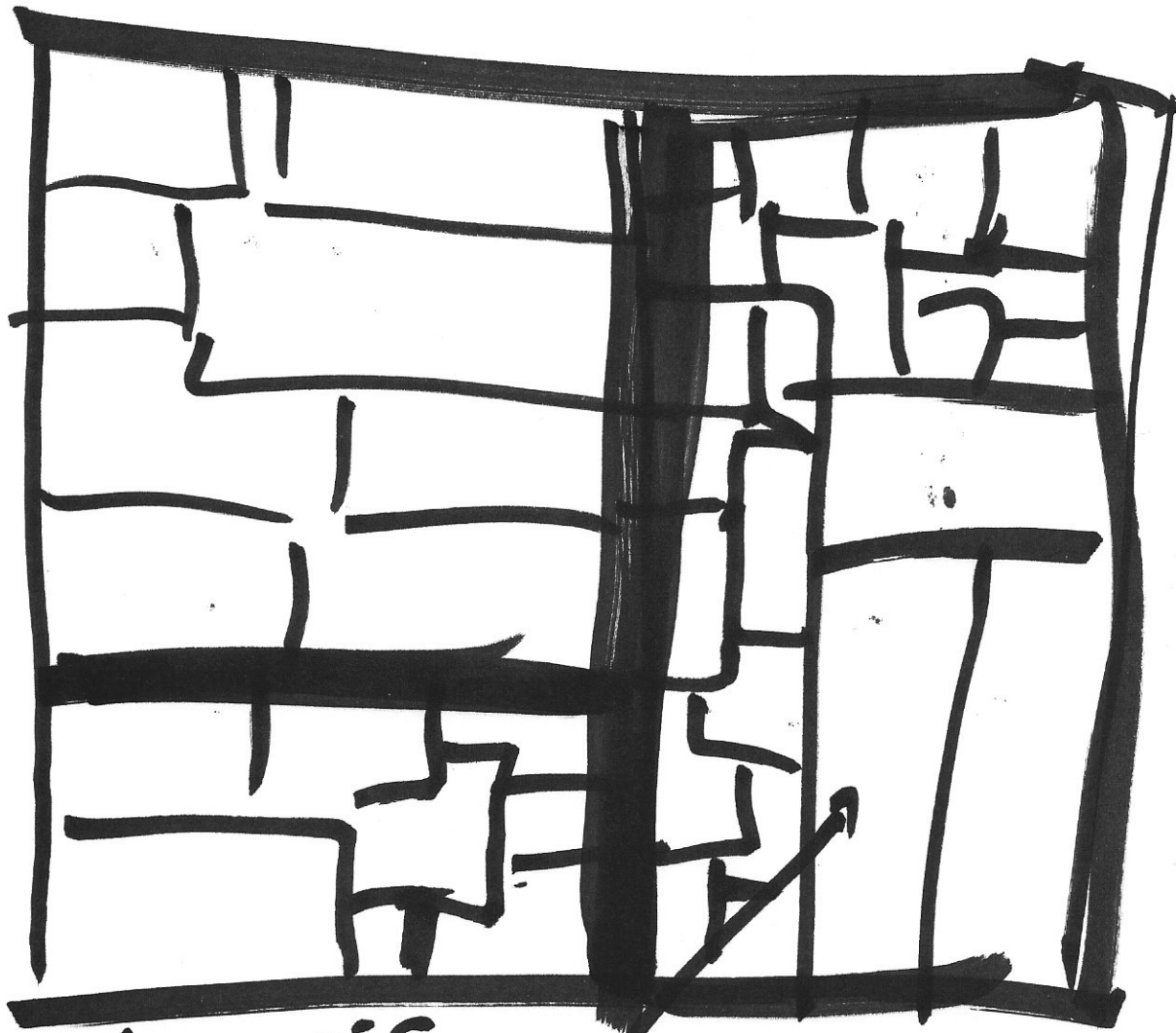
percent %

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①/ Run? Similar to current,
but flat, clickable,
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injuris

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Clickable for Details

