# Malaria Visualization Usability Test

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## Introduction

The malaria visualization is based on African malaria data collected from WHO form 2000-2013 and countries GPD data. As of May 2015 WHO has pledged to decrease the rate of malaria cases and deaths by 90% and eliminate malaria in 35 countries through adoption of the "Global technical strategy for malaria 2016-2030". WHO, through increased efforts in data collection, has seen a significant decline in the number of malaria deaths since 2000 which has been attributed to the tactical increase of tools made to prevent and treat malaria.

The online usability test using a current working version of malaria visualization shared by a JS fiddle link. The session captured all the feedbacks from each participant to come up with a prioritized list.

## Executive Summary

The test identified below problems including:

* + Lack of contrast in color coding.
  + County names are too big in the geographic visualization which impact the visibility of the visualization.
  + Sparkline layout is confusing need to rearrange the titles.
  + Animation is not working properly in the combined file.
  + Counties names are not consistent in sparkline and geographic visualization.
  + Typos in the background information.
  + Geographic visualization in vertical order make the whole visualization too long. Horizontal layout is better.
  + Titles of bar chart is not clear.
  + Lack overall statistics in the visualization.

## Methodology

### Sessions

Zhongqiao Jin from malaria visualization team conducted an online usability test at 04/04/2016 with three participants.

Test visualization used:

Geographic: <https://jsfiddle.net/zqjin/5o4urczd/>

Sparkline: [https://jsfiddle.net/chabobo/p5e66xh0/71/](https://jsfiddle.net/chabobo/p5e66xh0/71/" \t "_blank)

Barcharts: <http://jsfiddle.net/madisonjmyers/rL06xnac/1/>

**Task List with debriefing questions.**

1.Task List:

1.1. Look at our visualization outline. Can you tell us what this is about?

1.2. Look at our map of Africa. Play around with it. Is it intuitive?

1.3. Look at our small multiples viz. Is it clear to you?

1.4. Look at our animation viz comparing total number of infected malaria cases vs percentage of population. Can you understand it? Can you navigate it?

2.Debriefing Questions:

2.01 What is your name, age and profession?

2.02 Do you know what malaria is?

2.03 Do you know how it is contracted?

2.04 Are you familiar with the continent of Africa? Are you familiar with the countries that comprise Africa?

2.05 Where are the users taking the test?

2.06 What computer will you be using to complete the test?

2.07 Have you downloaded safari or chrome?

2.08 Please check which web browser you will be using safari   firefox

2.09 Please login to your computer, access safari or chrome, and enter \_\_\_ within the search bar

2.1 Do you see this visualization [insert image]?

2.11 How long did the visualization take to download?

2.12 Do you only see variations of the colors blue, red and black? If no, what other colors do you see and can you describe where the other colors are located?

2.13 The top pane of the visualization contains static boxes with ranges. What is written in the first box? Do you find this piece of information pertinent to the visualization?

2.14 Under the top pane do you see continents of Africa? If no, please call me over.

2.15 If yes, click on South Africa. Are you able to click on South Africa? When you click on South Africa does a text box appear? If no, please call me over. If yes, please write out the information within the text box.

2.16 Please click on South Africa for each African Continent. Compare the text box information? Do the number of cases vary?

2.17 Following this please hover over two additional countries and list the country and the number of Malaria cases for each country. If you are unable to hover please call me over.

2.18 Are you able to easily find how the color index relates back to number of cases? If yes, what color indicates zero malaria cases?

2.19 Now, please click on the click me button located next to the bar chart. If you do not see a click me button please call me over and indicate that you were not able to locate the button. Once you have located the click me button please click on the button three times. Does the visualization change? Please list the 3 titles you see.

2.2 Are you able to click on each bar? If yes, please click on at least four bars.

2.21 Are you able hover over the bars? If yes, what information do you see in the text box?

2.22 Now click on the Sparkchart, are you able to click on the first column? Are you able to click on each sparkline, are you able to hover over each sparkline? What information do you see when you click, what information do you see when you hover? Are they different?

2.23 Are you able to scroll down the sparkchart?

2.24 What is the last country you see on the sparkchart?

2.25 Do you find all the information presented relates back to the decline of malaria cases between 2000-2013?

2.26 Do you find all the information useful, or do you find some information redundant?

2.27 Do you like the format of the visualization? Do you have any recommendations to improve the visualization?

2.28 Is the text easy to read? Were you able to zoom into all images?

2.29 Was our initial drawing of our final visualization clear? Would you switch it around?

2.3 Was the map of Africa clear? Would it make sense to filter between malaria and weather or have them both visual at one time?

2.31 Are our small multiples intuitive and clear? If not, what would you change?

2.32 Was our final animation visualization clear? If not, what would you change?

### Participants

Three participants: Michelle Ouyang, Wenjing Ge and Terry Leng took the usability test. Michelle is a Data Scientist, Wenjing is a Quant and Terry is a product manager. All of them are from 25 to 30.

## Results:

* All three of them thought the title of the visualization need more elaboration.
* Two of them thought the color scheme should use a stronger contrast, the highest color coding should be changed from blue to deep blue.
* Three of them pointed out County names are too big in the Africa geographic visualization which covered the color behind the names.
* One of them point out that Sparkline layout need to be adjusted to show the relationship between GDP change and malaria development from a holistic perspective.
* Three of them mentioned the Animation is not working properly in the combined visualization.
* Two of them pointed out that counties names are not consistent in sparkline and geographic visualization.
* Three of them found typos in the background information.
* Three of them mentioned the vertical Geographic visualization took too much space in the webpage and is not convenient to have a continuous view in the malaria development. It would be much better if the visualization can convert the layout to horizontal and make the width of geographic visualization same as the sparklines.
* One of them mentioned the title of bar chart is not clear.
* Two of them suggest to have more statics in the beginning of the visualization so that people can have the overview at the first sec.

## Recommendations and Conclusion

Based on the feedback from all participants we concluded below prioritized list for our next step.

**MoSCow List:**

**Must:**

1. Clear the tile for each session make sure there is no type and confusing between and title and the visualization contents.
2. Reduce the number of counties in the visualization.
3. Include GDP data in animation.
4. Make maps horizontal.

**SHOULD:**

1. Adjust the legend color scheme. Add more contrast.
2. Simplify the text in the visualization

**COULD:**

1. Add more related data fields into the visualization to enhance the statement.
2. Integrate horizontal barchart.