Bring information alive
An introduction to data visualisation

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Overview

• Introduction to data visualisation
• Choosing the right chart
• Design tips
• Online data visualisation tools
1 Introduction to data visualisation
The presentation of data or information in a visual format with the goal of communicating information clearly and efficiently.
Visualisations can range from a conventional line chart...
...to interactive graphics with multiple variables.
The value of data visualisations

- Reveal patterns, relationships or stories in data.
- Tell stories in a compelling and immediate way which can be more memorable than words or tables.

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The value of data visualisations

• Visualisations can be easily shared with others.
The value of data visualisations

- Effective visualisations can alter perceptions, influence people and bring about change.
2 Choosing the right chart
## Column/bar charts

### Violence against women

<table>
<thead>
<tr>
<th>Region</th>
<th>Proportion</th>
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<tbody>
<tr>
<td>Africa</td>
<td>45.6%</td>
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<tr>
<td>South-East Asia</td>
<td>40.2%</td>
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<tr>
<td>Eastern Mediterranean</td>
<td>36.4%</td>
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<td>Americas</td>
<td>36.1%</td>
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<tr>
<td>Western Pacific</td>
<td>27.9%</td>
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<tr>
<td>Europe</td>
<td>27.2%</td>
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<tr>
<td>High income countries</td>
<td>32.7%</td>
</tr>
</tbody>
</table>

**Source:** WHO

### Pros
- Clear and easy to read
- Show even small differences in values

### Cons
- Can be dull. People rarely stop and look.

Source: The Guardian
http://www.theguardian.com/society/2013/jun/20/one-in-three-women-suffers-violence
Chart Suggestions—A Thought-Starter
Pie charts

Pros
• Pie charts are good for showing percentages.

Cons
• Don’t represent values accurately, which makes it hard to compare values.
Pie charts

Examples of bad pie charts

Too many values (and colours)  Values don’t add up to 100  Too many similar values

- Don’t show more than 4 values using a pie chart (group the rest into “other” category).
- Consider stacked bar charts as an alternative to pie charts.
Stacked bars

Pros
- Good alternative to pie charts when you have values adding up to 100%

Cons
- Can be hard to compare values in the middle.
- Lose smaller values
Bubble charts

Disease Case Fatality Rates
Average % of infected who die

- **AIDS (untreated)** 85%
- **AIDS (treated)** 20%
- **Bird Flu** 60%
- **Tuberculosis** 45.5%
- **MRSA** (serious) 19.8%
- **SARS** 9.6%
- **Swine Flu** 0.5%
- **Malaria** 0.3%
- **Bubonic Plague** 5%
- **Seasonal Flu** 0.1%

Guardian readers poll

1. **Which European country do you live in?**
   - **65%** England
   - **5%** Italy
   - **3%** France
   - **4%** Germany
   - **6%** Spain
   - **17%** Other

2. **Do you expect your country's economic situation to generally get better, stay about the same, or get worse over the next 12 months?**
   - **6%** Better
   - **20%** About the same
   - **25%** Worse
   - **26%** Don't Know
   - **22%** Can't say
   - **1%** Other

3. **To what extent do you trust the government to deal with the problems facing your country?**
   - **3%** A great deal
   - **23%** Quite a lot
   - **38%** Not very much
   - **35%** Not at all
   - **0%** Can't say

4. **To what extent do you trust all national politicians (whether in government or opposed) to act with honesty and integrity?**
   - **2%** A great deal
   - **20%** Quite a lot
   - **45%** Not very much
   - **31%** Not at all
   - **1%** Don't know
   - **1%** Other

5. **To what extent do you agree or disagree with each of the following statements: British foreign policy is a force for good in the world?**
   - **3%** Strongly agree
   - **19%** Agree
   - **31%** Disagree
   - **30%** Strongly disagree
   - **1%** Don't know
   - **1%** Other

Source: Worldwide figures from World Health Organization, CDC, Guardian
*estimates from secondary sources // ** based on poll figures

David McCandless // v1.2 // Sep 09
InformationIsBeautiful.net
Bubble charts: optical illusions
Design tips

1. Represent the data accurately
2. Style the chart simply
3. Use colour with caution
4. Choose a clear font
5. Use annotations to tell a story
1. Represent the data accurately

Always scale to zero
1. Represent the data accurately

Don’t use 3D charts
1. Represent the data accurately

Circle size by area, not radius

Size by radius

Size by area
1. Represent the data accurately

Provide context
2. Style the chart simply

Use a limited colour palette
2. Style the chart simply

Don’t fill with patterns
2. Style the chart simply

Mute gridlines
2. Style the chart simply

Order by value
2. Style the chart simply

Label as directly as possible
3. Use colour with caution

- Monochromatic
- Analogous (similar)
- Complementary
3. Use colour with caution

Monochromatic colours for a data map

Complementary colours to highlight

Similar colours to distinguish data

Bright colours to emphasise the important line
3. Use colour with caution

Have consideration for the meaning of colours

What is wrong with this picture?
3. Use colour with caution

Don’t use red and green together

(many people who are colour-blind cannot distinguish between them)
4. Choose a clear font

For screen
• Calibri
• Myriad Pro
• Helvetica
• Franklin Gothic

For print
• Georgia
• Minion
• Garamond
• Baskerville
4. Choose a clear font

Is this easy to read?

Is this easy to read?

Is this easy to read?

Is this easy to read?

IS THIS EASY TO READ?
5. Use annotations to tell a story

- Highlight important features
- Provide additional detail, context
4 Online tools
### Data: Estimated numbers of people living with HIV/AIDS in countries, regions

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Estimated adults and children living with HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>Sub-Saharan Africa</td>
<td>5600000</td>
</tr>
<tr>
<td>India</td>
<td>South and South-East Asia</td>
<td>2100000</td>
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<tr>
<td>United Republic of Tanzania</td>
<td>Sub-Saharan Africa</td>
<td>1600000</td>
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<td>Kenya</td>
<td>Sub-Saharan Africa</td>
<td>1600000</td>
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<td>Mozambique</td>
<td>Sub-Saharan Africa</td>
<td>1400000</td>
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<tr>
<td>United States of America</td>
<td>North America</td>
<td>1300000</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Sub-Saharan Africa</td>
<td>1200000</td>
</tr>
</tbody>
</table>

Source: *UNAIDS Report on the Global AIDS Epidemic, 2012*
Infogr.am

Select chart

Choose a type of chart
The burden of HIV/AIDS

Countries with the largest number of people living with HIV/AIDS
Add text, a photo or even a movie to your graphic.
THE BURDEN OF HIV/AIDS

35,000,000
Total number of people worldwide estimated to be living with HIV/Aids

Countries with the largest number of people living with HIV/AIDS

- South Africa
- Russia
- Malawi
- Zambia
- Ethiopia
- China
- Brazil
- Indonesia
- Nigeria
- Thailand
- Cameroon
- Angola
- Ghana
- Ukraine
- Lesotho
- Botswana
- Vietnam
Tableau Public
Interactive visualisations: Gapminder
Conclusion

• Visualisations effective way of sharing complex data and information – increases reach to non-specialist audiences

• Important when creating graphs and charts that the data is represented easily and there are some rules to ensure this

• Creating visually appealing graphics doesn’t require artistic talent – there are many tools on the internet that can do it for you

• Go to website, give it a try