Using effective visualization in maps and diagrams to better understand the SDGs

Menno-Jan Kraak
My maps,
The good, the bad and the ugly

Menno-Jan Kraak
Workshop
Using effective visualization in maps and diagrams to better understand the SDGs

- Introduction
  Exercise: Who is who?
- SDG Indicator characteristics
  Exercise: design your own map: Gender Inequality Index
- Cartographic workflow
  Exercise: define your own world view
- Design choices
- Conclusions
Exercise: Who is Who?
Draw the contour of your country

Ask your neighbor if she/he can tell where you're from
SDG

Indicator characteristics
Sustainable Development Goals
Example: Goal 4 Education

- Goals

- Targets

- Indicators

http://www.un.org/sustainabledevelopment/education/
Goal 4: Education - Sample Targets

• **4.1** By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

• **4.2** By 2030, ensure ……..

• …..
Goal 4: Education - Sample Indicators

- **4.1** By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

- **Indicator 4.1.1** Percentage of children who achieve minimum proficiency standards in reading and mathematics at end of: (i) primary (ii) lower secondary

- **Indicator 4.1.2** Completion rate (primary, lower secondary, upper secondary)
Goal 4: Education - Analyzing the data

- % minimum proficiency
- Completion rate levels of education
- % of 15yrs proficiency of environmental science and geoscience
- Early Childhood Development Index
- Participation rate in organized learning
- Participation rate among 25-65 years
- Enrollment ratios by level and type
- % of computer and information literate
- % of proficient
- % of 13yrs promoting governance
- Parity indices (female/male, urban/rural, .)
### Indicators and data types

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SDG indicator tiers

Incomplete indicators

- **Tier I:** internationally established methodology and standards
  - Data regularly produced for at least 50 percent of countries and of the population in every region
- **Tier II:** data not regularly produced by countries
- **Tier III:** methodology or standards are being (or will be) established
Nature of the indicators

1. Absolute value
2. Proportion
3. Rate
4. Index
5. Ordinal value
6. Nominal value
Exercise: design your own map
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Gender inequality index
Design & draw the map legend
Cartographic Workflow
Gender inequality index

## Gender inequality index

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</tbody>
</table>
Perception
Perception
1. Data analysis

2. Select map or diagram
   - Nominal
   - Ordinal
   - Interval
   - Ratio
   - Geography

3. Select base map
   - Topography
   - Satellite
   - Admin units

4. Find required perceptual properties
   - Differentiation
     - Order
       - Distance
       - Proportion

5. Select visual variables
   - Size
   - Value
   - Texture
   - Color
   - Orientation
   - Shape

6. Select symbology
   - Point
   - Line
   - Area
   - Text

7. Select map type
   - Chorochromatic
   - Isoline
   - Choropleth
   - Proportional pt.
   - Other

8. Apply design style

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Gender inequality index

Gender Inequality Index

- No Data
- 0.04 - 0.14
- 0.15 - 0.33
- 0.34 - 0.50
- 0.51 - 0.77
Map projections

Gender Inequality Index

- No Data
- 0.04 - 0.14
- 0.15 - 0.33
- 0.34 - 0.50
- 0.51 - 0.77
Not visible: Small Island Developing States (SIDS)?

Proportion of population below the international poverty line, 2016 (%
Moving central meridian
Exercise: define your own world view
Go to: https://worldview.calisto.pt

Move the central meridian on the scroll bar below each map into a position you think gives your best global perspective, and click save

Select your country
How should your world look like?

- Multi-wide map projection
- Google's interrupted homologous map projection

What is your country of residence?
Local perspective
‘Local’ point for global perspective

But what about comparing?
Design choices
Gender inequality index

Gender Inequality Index

- No Data
- 0.04 - 0.14
- 0.15 - 0.33
- 0.34 - 0.50
- 0.51 - 0.77
Choice of color - what do you want to tell?
Choice of color - bivariate solution

Legend:
- 0.01–0.31
- 0.32–0.46
- 0.47–0.62
- 0.63–0.77
- No data
Different patterns because of number of classes
Different patterns because of classification

Same amount of observations per class

Equal class size

0.15–0.30
0.31–0.46
0.47–0.62
0.63–0.77

0.01–0.23
0.24–0.39
0.40–0.53
0.54–0.77

No data
Population related topics
Alternative representations

Infant Mortality per 1000
(Indicator 3.2.1)

- a) Choropleth
- b) Cartogram
- c) Choropleth and nightlight basemap

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Conclusions
Mapping problems

- **Base map**
  - Projection (web services work with Mercator projection….)
  - Content (often satellite imagery / open street map are used….)

- **Administrative units**
  - Size
  - Distribution within unit (people, other)

- **Design flaws**
  - Choice projection / adm. units
  - Data handling
  - Application of visual variables

- **There is a limited use of the available graphic representations**
ICA’s objective

Offer guidelines and best practices for mapping the UN SDGs to...

• Best support the SDGs through Cartography with help of the cartographic community

• Transfer knowledge and expertise via the book *Mapping a sustainable world* and various training related activities
Let’s make the world a better place with maps