

GRAPH MEMORY GAME

Carol.Bartels@rivm.nl

INTRODUCTION

The Netherlands Environmental Assessment Agency (part of the National Institute of Public Health and the Environment, RIVM) provides the Dutch government with information for policy making on environment and public health. Since the policy question or policy problem should be addressed by exactly the right answer, policy support requires special care in choosing the right data, model and visualization method. From the scientific point of view the answer has to be both scientifically correct and suitable to policy considerations.

WHICH FIGURE FITS THE MESSAGE?

The first step in map and graph design is to define the purpose of the figure, the target group and the medium. Always answer the following questions:

1. What is the message or purpose of the figure?
2. Who will read it? (define the target group!)
3. How will the figure be used?

It is a challenge to present figures to our target group: policymakers. The basic principle is that the policymaker must gather the right message from a figure in a glimpse. The visual impact of a table is much less than that of a figure. By presenting data in a figure choices are made, consciously or subconsciously. Furthermore, small changes in the figure can have a big impact on the message. Therefore, it is important to be conscious of the choices.

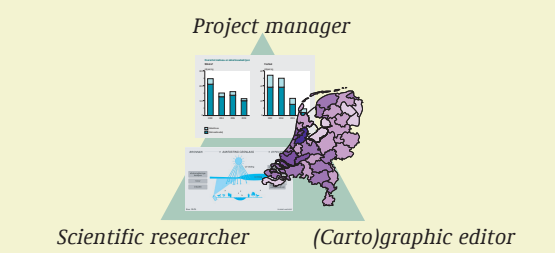
GRAPH MEMORY GAME

The Netherlands Environmental Assessment Agency has developed the **Graph Memory Game**. The Graph Memory Game consists of a number of practical examples from environmental publications. In these examples a set of data is visualized in a graph or a map in different ways. Participants of the game (mostly researchers) are guided interactively through the examples by a member of the editorial staff. Tips and pitfalls are clarified and discussed. The purpose of the game is to make participants aware of the choices being made, when creating a graph or map.

MAP AND GRAPH EDITING

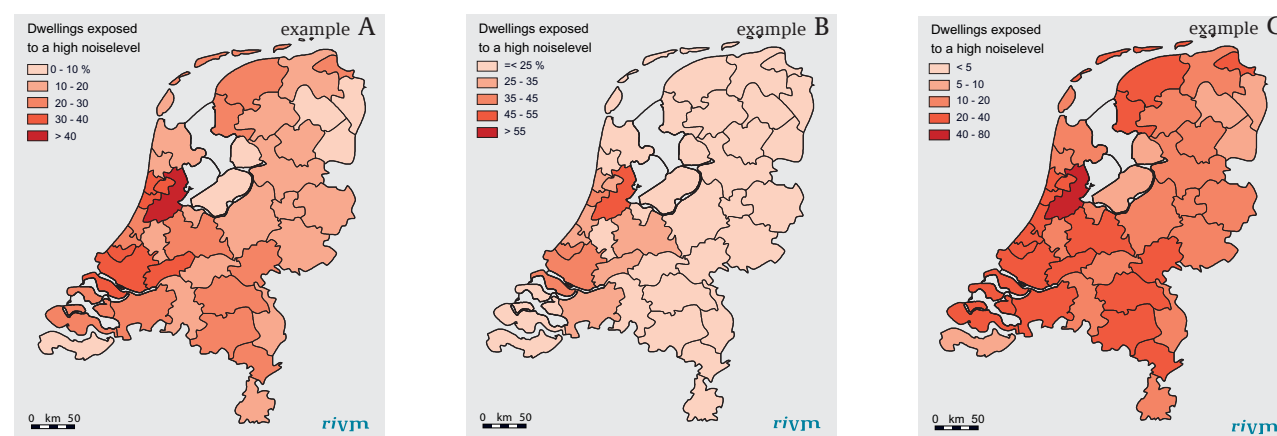
At the Netherlands Environmental Assessment Agency, the production of illustrations (maps and graphs) is coordinated by the "Map and Graph Editing Team". This Editorial Staff is responsible for the coordination and planning of the process from visualising data to the creation of the camera-ready product. The Editorial Staff facilitates this process by designing (carto)graphic guidelines for optimising and harmonising maps and graphs. The core of the Editorial Staff consists of Marian Abels, Carol Bartels and Jan de Ruiter.

Role of the map- en graph editing team: to make project managers and researchers conscious of the choices being made. Every illustration will be discussed by three experts:



ONE DATASET: MANY POSSIBLE VIEWS.....

An example: comparison of maps using different ranging methods: the maps below were developed from exactly the same dataset, but they convey quite different spatial patterns and therefore different messages to the policymaker.



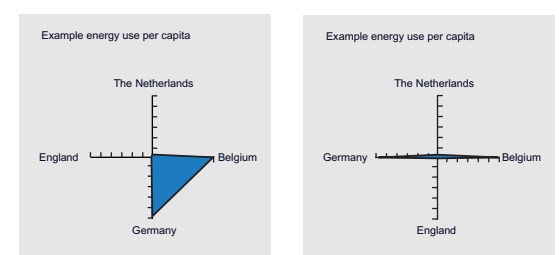
All three maps have five classes, portrayed with a graded sequence of gray tone area symbols that imply from "low" to "high" rates of noise pollution. Map A portrays a balanced distribution, based on evenly spaced steps. This is the most common classification, although the mapmaker has to check whether this distribution conveys the message correctly. Without analyzing the legend, map B gives the impression that there is no heavy noise pollution in the Netherlands. By choosing another classification, see map C, the message is contradistinctive: there seems to be serious noise pollution in the Netherlands. The middle and right maps have both user defined ranges.

This example shows that a single choropleth map presents only one of many possible views of a geographic variable.

MAP EXAMPLE

GRAPH EXAMPLE

Both graphs are based on the same data. What's the difference between these graphs?



The only difference is the order of the axes. The data set is equal, but by changing the axes order, the information that the figure provides is dramatically changed. The figure left shows a substantial difference between Germany/Belgium and England / the Netherlands, the figure at the right implies a different balance between the countries. Coloring the area suggests a significance of the surface area. However, the area is not determined by the data value, but by the order of the axes. Alternatively, drawing a line instead of coloring the area, is not correct either; because the real data values of a radar plot are the intersections with the axes. Only use radar plots when the data concerned has a fixed order.