

Communicating World Data?

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ABSTRACT

Maps are an important way for us to make sense of the human world, making such a large, diverse and complicated entity more 'knowable'. Mapping styles and what is shown change; both are affected by the social and technological conditions of the time. The coincidence of the availability of new data with the development of a density-equalizing algorithm by Mark Newman (University of Michigan) has resulted in a series of cartograms that visualizes hundreds of world-level datasets.

These maps are freely available at: www.worldmapper.org. The focus here is the process of making these maps and sharing them with the public. The distributions of many elements of our lives can be mapped, including income, education, disease, and communications infrastructures. When these data are visualized stark international inequalities become evident. I will present maps of international communications infrastructures and their usage. My future research will question how people interpret such maps – in terms of their legibility and the causes of the unequal distributions that are shown.

Categories and Subject Descriptors

J.4 [SOCIAL AND BEHAVIORAL SCIENCES]

General Terms

Algorithms, Measurement, Design, Economics, Human Factors, Standardization.

Keywords

Cartogram, International Inequalities, Web Resource, World Data

1. INTRODUCTION

This paper introduces a world-mapping project, which has created a free online resource of 366 world cartograms that show a range of social and economic data. I will address the methods used to make these maps, how to read these maps and some challenges that have been encountered in undertaking this project. Following this methods-based beginning, some more substantive work will be shown. Three maps of Internet access will be shown. Other

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maps of communications that are available online show the use of mainline telephones, cellular telephones and televisions. My doctoral research is concerned with how maps of this type are understood – I conclude with the research questions that have been generated whilst working on the Worldmapper project.

2. MAP MAKING

This mapping project has resulted from the coincidence of two important developments. One is the development of the density-equalizing algorithm used to make these cartograms. The other is the increased quantity and quality of world data that are available.

2.1 Algorithm

These maps are made by allocating numbers to each territory (usually member states of the United Nations), and then re-sizing territories according to the proportion of the total that is found there. Thus, if half the world total is found in a single territory, it will be allocated half of the available area on the map.

This idea of using map area to represent something other than land area has existed for a long time. What is new with these maps is the retention of detail on the map and the speed at which area is redistributed. Keeping detailed borders has a double advantage. Firstly, it maximizes the legibility of these maps by keeping recognizable shapes. This is useful because people find it easier to identify territories. Secondly, being able to see the shape of coastlines and international borders has greater aesthetic appeal than earlier cartograms, which took a more cuboid form.

The algorithm that makes these maps was developed by Mark Newman and Michael Gastner [1]. Newman refined this, and wrote software to easily produce hundreds of cartograms.

2.2 Data

The data used to make these maps is generally sourced from United Nations agencies. The increased availability of data has increased the number of topics that it is possible to map. Despite recent improvements in data availability, most world datasets are incomplete. It is necessary to have data for each territory, so missing data are either accessed from an alternative source, or estimated based on the rate per person in neighbouring territories. Assumptions and estimates made by Danny Dorling and John Pritchard when preparing these data are detailed on the Worldmapper website and elsewhere [2], in order to maximize transparency.

3. ACCESS TO MAPS

Maps, educational posters, standardized data, technical notes, academic papers and magazine articles about this project can be sourced at no cost from the Worldmapper website:

www.worldmapper.org. The categories of maps that are currently available are: Basic, Movement, Transport, Food, Goods, Manufacturers, Services, Resources, Fuel, Production, Work, Income, Wealth, Poverty, Housing, Education, Health, Disease, Disaster, Death, Destruction, Violence, Pollution, Depletion, Communication, Exploitation and Action.

The aim is to make this work and the underlying data accessible to people, thus increasing awareness of how different parts of the world fit together.

4. MAPPING COMMUNICATION

What follows are three examples of maps produced by this project. Comparing Internet use in 1990 with that in 2002 (Figures 1 & 2) shows that there has been considerable expansion of Internet use to new areas over that 12 year period. Although Internet use has greatly expanded, Figure 2 indicates that by 2002 access to the Internet remained low in much of Africa. In contrast territories such as the United States, Japan and South Korea were home to many Internet users.

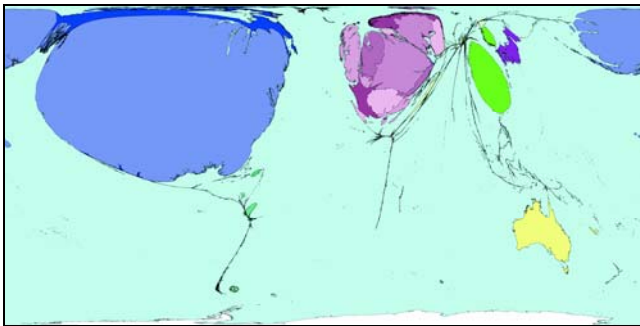


Figure 1. Internet Access in 1990. Worldmapper map 335.

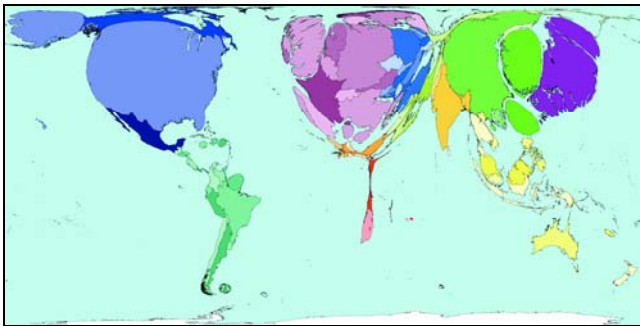


Figure 2. Internet Access in 2002. Worldmapper map 336.

The Worldmapper project aims to communicate information about the world, primarily via an English-language website [3], so this work is mainly limited to Internet-connected Anglophones. This is illustrated in Figure 3, which shows the worldwide distribution of hits on the Worldmapper website. We are beginning to translate this website in order to make this resource accessible to more people; however being internet-based many people are still likely to be precluded from its use (see Figure 2).

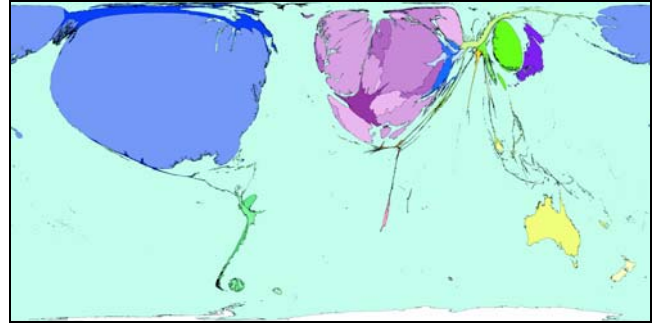


Figure 3. Hits on www.worldmapper.org.
Worldmapper map 366.

5. FUTURE RESEARCH

This work has illustrates how where you live affects your life chances [4]. I am now interested in investigating how people living in different parts of the world interpret these maps, and explain and understand their own social, economic and geographical positions. I will address:

1. How do people living in different parts of the world understand their positions in relation to those living elsewhere? How do they consider themselves to be connected to others?
2. How do people interpret new cartographical representations of the world? Do these fit understandings or challenge them?
3. Why do people interpret the world in the way that they do?
4. Are Worldmapper maps an effective visualisation, and what could make them more useful as tools for communicating information about the world?

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