Eurostat - Stats in a Wrap

How do we show data with maps? - Part I
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Jonathan Elliott
Stats in a Wrap, the podcast series from Eurostat.

Jonathan Elliott
Hello, and welcome to another edition of Stats in a Wrap, a podcast all about statistics brought to you by Eurostat, the statistical office of the European Union. I'm Jonathan Elliot, your host for this episode, which is all about stats and maps. That's right. The things we navigate with when we're driving used to fold up, but now all carry in our pockets, on our phones, of course.

We've never had so much mapping power to hand, but as well as navigation and geography, maps are powerful tools for visualising data, especially statistics. And nowhere is that more true than among the 27 Member States of the European Union. In an era of short attention spans and information overload, it helps enormously to show time-poor citizens statistics in context.

Maps can translate immensely complex numerical data into strikingly clear visualisations and give us an instant snapshot we can all understand. And now powerful software makes it easier than ever to create infographic maps ourselves. But while errors with numbers in a table might be easy to spot, images representing them are more subtle, and it is easier to mislead if you don't know what you're doing.

And that's important because geographic information systems, as they're known, are the gateway to the public understanding of the data that affects them, which is why I'm very excited about today's episode. And so, without further ado, I would like to introduce our four guests to talk about maps and data. They are: Konstantina Michalopoulou, who is a statistical and communications officer at Eurostat. Konstantina, welcome.

Konstantina Michalopoulou
Hello, everyone. Thanks a lot for inviting me. I'm happy to be here.

Jonathan Elliott
Lovely to have you here, Konstantina. Riccardo Sgaramella is the coordinator of the EU Annual Report on the State of Regions and Cities and a policy officer at the European Committee of the Regions. Ricardo, welcome.

Riccardo Sgaramella
Hello. Hi. Thanks for calling me. I'm very happy to be here with all of you. Thanks.

Jonathan Elliott
Thanks. And Joseph Davies is a data visualisation specialist front end at GISCO, at the European Commission. Joe, welcome.

Joseph Davies
Hello, everyone. Thanks for having me, Jonathan.

Jonathan Elliott
And last by no means least - Hannes Reuter is a statistical officer, also at GISCO. Hannes, welcome.

Hannes Reuter
Hey, good morning, everybody. Thanks for having me around here.

Jonathan Elliott
Wonderful. Wonderful. Wonderful to see you all here. Now, Joe, just tell us a little bit about your work. First of all, you're a cartographer, you're the map specialist here, among other things. Can you just tell us a bit about what GISCO is, and what it does?

Joseph Davies
GISCO is essentially the provider of geospatial services and data for Eurostat and the European Commission. We are everything - maps and geospatial data. So, we handle mapmaking, we handle the processing of geospatial data and its dissemination.

Jonathan Elliott
And working alongside Joe is Hannes. Hannes, you're also at GISCO. Just tell us a bit, you've got a very big remit, haven't you? I mean, the sheer scale of the information output that you need to work with is quite substantial. Just tell us a bit about the scope of your work.

Hannes Reuter
Thanks, Jonathan. Maybe I would like to explain first this little acronym GISCO which we will be hearing during today, GISCO stands for Geographic Information System Coordination of the European Commission. And the Commission is really good in inventing acronyms.

Our scope of work starts off obtaining geospatial data, analysing it, and then disseminating it out to the European public, or our main customer, which is or is the European Commission where we are bringing out this kind of geospatial data, geospatial services to our clients.

Jonathan Elliott
I mean, that's, that's all always good to know. We have a few other acronyms coming up, I think, as we go through. Konstantina, of course, you're within dissemination. You're out there telling the public about the great work that's going on at Eurostat. And you probably have to deal with quite a few acronyms yourself, I imagine. Just tell us a bit about your work and particularly how it works with data visualisation, infographics and maps in particular.

Konstantina Michalopoulou
So basically, my work in dissemination is twofold. I am the social media coordinator for Eurostat. And I am also part of the institutional support service where we reply to questions coming from colleagues

working in other EU institutions and services. Basically, maps is an excellent way to present data and to tell the story behind the raw figures and help people understand our data, which is our overall objective in dissemination.

Jonathan Elliott
Absolutely right. Yes. Well, we'll be hearing a lot more about the public perception of data and statistics through maps and how important that is a little bit later. But Riccardo, let me come to you. Just help us out with the European Committee of the Regions and the EU Annual Report on the State of the Regions and Cities. Tell us a little bit more about the Committee and its report.

Riccardo Sgaramella
The CoR, the Committee of the Regions, is an assembly of elected politicians at local level, which are gathered in Brussels, and we work as a *trait d'union* between the European institutions, so, the "Brussels bubble", and the regional level. We are based on memberships and these members are locally elected politicians. Our angle is the regional level. We focus on which are the main challenges or the main novelties.

Regions and cities are those facing the most impacts of the crises: we have passed via the COVID crisis a few years ago, we have the climate changes and the climate crisis. Now we're having also the impacts of the Russian war against Ukraine. These are three topics that we may include in our annual regional report, and then we focus on what are the regions doing and how they are overcoming these challenges and crises.

Jonathan Elliott
Let us just remind ourselves, this is the 17th edition of Stats in a Wrap and regular listeners will know that sometimes as a little icebreaker, I like to test our guests with a brain teaser, a quiz, in fact. Yes, it's the 2024 inaugural Stats in a Wrap quiz, which only has one question. Joe Davies is disqualified from the quiz because he knows too much. And unfortunately… He would win, he would beat you all hands down, no problem. No problem. He's got a…he's got to act as an advisory role today. In fact, I might ask you, Joe, if you do know the answer.

Joseph Davies
No Pressure.

Jonathan Elliott
Okay, so one question, one question. The following terms all refer to something in cartography. Fingers on the button. What are the following terms? What do they all have in common? What do they refer to? The "armadillo", the "Waterman butterfly" and, number three, "Boggs eumorphic". To what do these terms refer? Fingers on the button! Anyone who's got any answers? Not Joe! Not Joe! I told you he'd know.

Hannes Reuter
No Idea.

Jonathan Elliott
No idea. Joe, help us out.

Joseph Davies
Yeah, no pressure. But I believe they are all map projections.

Jonathan Elliott
They are indeed all map projections. Yes! The Waterman butterfly, yeah, it has its own Wikipedia page. In fact, if you go to Wikipedia list of map projections, there are over 90. And I think actually, historically, I don't know, Joe will know, there are like hundreds, hundreds of attempts to make the world, which is spherical, roughly in, onto a flat plane.

Person on street 1
I think the advantages of maps are that they are more visual. So, it's, in the most cases easier to understand what they show you instead of looking at a table.

Person on street 2
With maps and things…the colours, you know. A lot of maps are very colourful, and that can draw you in quite a lot to reading things. Obviously, if the map is just black and white, and it's very complicated I think that might maybe put you off.

Jonathan Elliott
Joe, can you tell us, I mean, you know, tell us a bit about how maps have shaped our awareness of the world and sort of left political legacies that persist to this day. I mean, there are, there are countless examples, but just to take us through some of your favourites, and perhaps just explain to us how fundamental mapping is to our understanding of the world.

Joseph Davies
Yeah, well, I mean, map projections are a great segue into how important maps are in our lives. I mean, if we go back to, you know, before GPS, when we were using maps to navigate the seas, I think the most common map projection used on world maps nowadays is the Mercator projection, which was developed in the 16th century, I think, by a Flemish cartographer, Mercator… which was great back in the day, because it meant that, you know, ships could essentially draw a straight line on the map, and that would be a true bearing of their navigation.

But nowadays, it's less important to have that and the sort of legacy of that map is, is it distorts the polar regions massively. So, the typical example is Greenland. You look at our political world map in a classroom and Greenland will be almost bigger than Africa, if not bigger. Whereas in reality, it fits into Africa 14 times and Russia almost twice so it's... Our vision of the world has been distorted over hundreds of years.

So, when you show, you know, a true size or you know an equal Earth projection or something, then it's sort of, yeah, it's shocking. I mean, don't get me wrong, no map projection is perfect because you're trying to put a globe onto a 2-D plane. So, there are always sacrifices to be made. It's always sort of a compromise. And at Eurostat, we choose to use the Robinson projection, which is seen as a good compromise to maintain, so...

Jonathan Elliott
If you go to Google Maps, even right now, and anybody listening now and they went to Google Maps and they zoomed right out, they would see the Mercator projection, they would see this enormous

Greenland compared to modest sized Africa; why are Google who you'd think would know about these things, still using a map projection made in the 1600s?

Joseph Davies
Yeah, it wasn't seen as a problem for a long time. But we forget about sort of cognitive bias that we have as a result of seeing, you know, Europe being larger than it is compared to other regions, etc. But thankfully, there is sort of a movement growing in the cartographic space where people are starting to move towards better map projections. And in fact, I think even, yeah, the one you mentioned, we will be moving towards more of a composite map projection in the near future, so...

Jonathan Elliott
Ahh… 400 years late… mhmm…tech giants, they move slowly, don't they? Hannes, let me come to you now talking about the work of GISCO. It's the Geographical Information System of the European Commission. Essentially, the Commission's mapmaker. Can you just unpack that a little bit for us? And maybe also…I just wonder if people - maybe thanks to the internet now - are a little bit more aware of maps than they used to be? What do you think?

Hannes Reuter
We're providing corporate level services – you know, we're getting the data, we're making them correct and bring them up to standard and then we're bringing out these services to everyone in the European institutions. To your second question: what happened over the last couple of years, that in the past, people have just brought the data. But what has completely changed is: now we provide services, we provide what we call in nerd speak application programming interfaces, APIs.

And people pick that up. And suddenly, they are much more map aware, API aware, and our services are somewhere used in the European institutions, like in the Committee of the Regions or wherever, you name it. And suddenly, it's "booooch", when you see it take up again. And this is like, just to answer your question: are people more map aware? Yes! I mean, coming back to your first question where you said about statistics, if you make Germany, everybody knows the geometry of Germany, you know how Germany looks like. But someone needs to provide this what we call geometry to the user.

Person on street 3
I think you can definitely locate everything way better. Just because when I see like an Excel table, I will not know what to do with that information. And when I see that something is like in a big city, or just wherever, in what country, you can definitely like, you know, see more of why the things are the way that they are.

Person on street 4
A bar graph is abstract, but everyone recognises their bit of the map, you know. So, if you see a number next to your country, you automatically zone into it, it's a very easy way to send data across the world, I think.

Jonathan Elliott
Perfect. Well, as well as geography, maps help us understand the data about individual territories, as we show population, economics, employment, and whatever it might be in each of those territorial units. The mosaic tiles if you like, that make up the EU's regions. And we'll be coming to Riccardo to find out

a little bit more about that. But I mean, Joe, as a cartographer, just tell me a bit about how powerful maps are for explaining data at the granular level, at region-by-region level.

Joseph Davies
In terms of efficiency, if you just imagine, you compare the speed in which you can sort of gauge values, you can read values in a table, in a list, and then compare that to those regions plotted on a map, you know, your eyes are automatically drawn to where you want to see essentially. So the speed in which a reader can get an impression of a dataset is almost immediate with a map whereas with a table or, or maybe some other form of chart is not as efficient.

So, just in terms of speed, right straight off the bat, you know, a map is super-efficient. And also, in terms of the tools that cartographers have to visualise data: shape, size, orientation, colour hue, textures, they are also immediate. So, if you have a colour ramp going from light to dark, the dark values on a light background will immediately stand out.

So, the user can immediately gain an impression on a map of Europe, of which are, you know, the outliers, which are the highest values, which are the lowest values. So, in terms of a data visualisation tool for geospatial data, you know, it's, it's, it's the best. Of course, I'm going to say that because I'm a cartographer.

Hannes Reuter
But Joe, may I contribute to that one as well, because Jonathan, what you ask here, or what Joe has outlined here is from, let's say, a cartographic perspective, but you need to also take into account that countries are all different size, right? So, compare Luxembourg to my home country, Germany, there are completely huge differences in terms of area, in terms of population.

And for that one, we have statistical regions. And one word which will always come up and which the podcast readers, um, listeners have heard is the NUTS which divides a country by its area and population to standardise it. So, we have similar size areas here to make them comparable.

Jonathan Elliott
Awesome. Yes! Worth remembering the NUTS acronym here refers to regional subdivisions in the EU that help to compare like with like, we'll be hearing more about those. And they subdivide countries to something like 244 regions that then subdivide again, down to 1200 or so, very handy in understanding EU stats. Konstantina, I just wanted to ask you, what are the kinds of visualisation in your experience that have made a difference to the conversations in the general public among your social media users?

Konstantina Michalopoulou
Every time we use a map on social media, this is successful. And there are cases when we used to have just the raw figure for the EU. And then when we presented the same information for all EU countries, in the form of a map, we saw a spike on comments and shares. So that was quite successful on social media.

And there are several cases where a timeline, for example, or a bar-chart, or basically there are cases where a map complements the information presented on a timeline. For example, there was a case where we had in the form of a timeline the crop production, the cereal production in the EU. And then

we had a map to show data about the maximum temperature. And that was a way to complement what was presented in the timeline.

Jonathan Elliott
I mean, it follows common sense, doesn't it, because your attention is drawn immediately to something that's got visual interest, of course it is. And then you're going to follow and want to unpack exactly what you're seeing.

Konstantina Michalopoulou
And of course, whenever we have regional data, there is always a map to present it, there is no other more effective way to do so.

Joseph Davies
I think I remember recently, I had to go through a list of all the maps that have been published on Eurostat social media. And I think of the top 10 posts across all social media channels last year for Eurostat, they were all maps. So, they are consistent performers.

Person on street 5
You can visualise the data by colour coordination if you have a legend at the bottom that properly highlights what each portion is showing, or you can have pinpoint locations as well that have a blurb or a sort of explanation of what the data is showing. And then again, have a legend.

Jonathan Elliott
Riccardo, I wanted to come to you here because showing data in this way is obviously attractive. And it illuminates different stories and trends and so on. But it also helps policy discussions, doesn't it? It helps people in different regions evaluate their own social and economic geography, in comparison to other regions. Can you just tell us a little bit about how this is more than merely decorative and interesting? It's actually a useful tool for policy, isn't it?

Riccardo Sgaramella
Yeah, definitely I can give you two examples that come to my mind. Within the CoR we also deal with the Territorial Impact Assessments (TIAs). And in this framework, we have recently had a presentation in the working group of the Council, where my director showed different maps created on the basis of the territorial impact assessments. And these started a discussion with the delegates within the working group, which was absolutely very welcome.

This gives an example of how just showing a few maps you can get more interest from the policymakers themselves. And they try to understand how the sensitivity of their own region was more or less affected on different specific impact assessments that we have done by ourselves. This is just an example.

As a more generic one, I can give you also an example of a map from a communication of the European Commission, where they analyse what Green Deal means for regions. And as you can see, in one side, you can have how regions would benefit from the Green Deal, from the transition, while on the other side, you can see the regions which will have more challenges than benefit coming from the transition, coming from the Green Deal per se.

If you think about the Green Deal, not everything is fantastic, not everything is working fine, but this is the macro idea that you get. Once you get the vision of the regional perspective, you can see why this is not working, why some regions which are heavily industrialised, cannot benefit from then transition, from the Green Deal whilst others which are more rural than urban can also have more benefits than challenges and vice versa.

The same policy can have different aspects just based on a map. And a map can help you to compare. For example, the North is very welcome towards the transition, the South needs the means. So of course, for them, for those regions the transition is more a problem, a challenge than a solution, than a benefit. And I can go on, but these clearly show a divide.

And these divides generate, as Konstantina was saying, generate interaction, generate comments, generate questions: why, what can we do? What do you do? Which are the best practices that we can use? Maps can definitely help policy and I think they absolutely do so.

Jonathan Elliott
It is fantastic how these maps can accelerate the understanding of a discussion, it's like putting the whole debate on steroids and taking everybody to a more advanced level. Because once you've got the map in front of you, those are the facts, those are the hard data in picture form, to be sure, but you, you can't really argue with it. So, then you may as well start discussing the significance and what policy interventions there should be, and so on, and so on, and so on.

But we're going to take a little break now and invite our loyal listeners to delve further into the world of maps, stats and data in part two of this podcast, in which we'll be looking at the dark side of data visualisation in maps, and what happens when they go wrong. And we'll be hearing about how "Barbie the Movie" got banned in Vietnam, all because of a map.

If you'd like to know more about the amazing maps that can be made with GISCO's IMAGE map-making tool, then you should head to Eurostat's webinar on that very subject which will take place mid-April. Check out the Eurostat website for more details. Goodbye.