

## Eurostat - Stats in a Wrap

# How do we show data with maps? - Part II

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### **SPEAKERS**

Joseph Davies (Eurostat), Konstantina Michalopoulou (Eurostat), Hannes Isaak Reuter (Eurostat), Riccardo Sgaramella (Committee of the Regions), Jonathan Elliott (host)

### **Jonathan Elliott**

Stats in a Wrap, the podcast series from Eurostat.

### **Jonathan Elliott**

Welcome back to Stats in a Wrap, where we're talking about maps and the visualisation of data using so called geographical information systems, especially as they refer to the European Union. We've already heard in part one about the amazing work of GISCO, the team in Eurostat that deals with mapping of geographical and statistical data.

And now we're going to come to the bit of the podcast, which is like a kind of, well, the dark side of mapping. We're going to talk a little bit about how easy it is to make, well, just a tiny little perfectly innocent error in the rendering of a map that can completely distort what you're trying to do. Joe Davies is a visualisation specialist at GISCO. Joe, can you outline for us the classic pitfalls in mapmaking that you come across in your work?

### **Joseph Davies**

You know, when we're presented with a map, these are the facts, we can't argue with it. Whereas often we find they can be misleading to a certain extent, whether it's deliberate or not. There are certain decisions we can make in mapmaking that can determine the viewers' impression of the data.

There's quite a famous case recently, there was a visualisation created by Karim Douïeb, I think it was, I probably mispronounced it. But it was called "Land doesn't vote". And the title essentially was saying that there was this election map of the US that was covered in red, because it was a choropleth. So, it was each region coloured according to the political party.

### **Jonathan Elliott**

Definition of a choropleth is where a region is coloured specifically, is that right?

### **Joseph Davies**

Yeah, you use colour hues to indicate magnitude in the data. Yeah. And in this case, it was more categorical than anything, it was either blue or red. And the majority of the map was red because you have these large counties that don't necessarily have a lot of inhabitants. So, what Karim Douïeb did, he said: "Land doesn't vote". He changed the size of each region according to its population, which gives a much more realistic picture.

Because, as the title says of the visualisation: “Land doesn't vote, people do”. So, the inhabitants is the more important data to pick up on in this visualisation rather than, you know, the land area. That's sort of a famous example that went across social media a couple of years ago. But in terms of Eurostat, in our statistics, we find that accidentally a lot of people choose the wrong statistical map type, the wrong thematic map type.

They'll go for a choropleth, when it should, in fact, be a proportional symbol map. This essentially means that they have total value. So, for example, you have total population almost depends entirely on the size of the NUTS region. So, it would be a lot more appropriate to visualise a total count using symbols that are scaled according to that total rather than a choropleth map where you just simply colour in the region.

### **Jonathan Elliott**

So just to clarify, when we say NUTS, that's the classification of subregions across the EU that each Member State breaks down into, and there are three subdivisions: NUTS 1, 2 and 3. But in the proportional symbol map that you just mentioned, rather than colours, which is the choropleth, you could have columns say poking up out of the ground representing population of that particular NUTS region, is that right?

### **Joseph Davies**

I think if you visualise a bubble map, it's often called a bubble map, so you have different sized circles according to this total, or the count. Whereas often people will want to put that into colours, they want to colour each region according to that total, which is a mistake, it's a cartographic pitfall, which is completely innocent. Which is why in our tools, we try and make sure that the users don't commit these errors. And, you know, we essentially try and hold their hand through this.

### **Person on street 6**

Colour schemes can be nice if you have a nice legend that just displays what everything is at the bottom, or you can do like different pinpoints for certain things. And they have bubbles with like certain percentages and numbers, and then again, have a legend, that sort of thing. It can work, especially when you consider like the borders that have been changed so much over time with something like a situation like Israel and Palestine.

### **Jonathan Elliott**

Well, this is where Hannes can help us out with the politics side, because there are obviously accurate and inaccurate maps. And, Joe, you've helped us wonderfully with that. But often, it's not a mistake that's causing the trouble but simply a statement of an official point of view, especially when there are border disputes, for example, where countries don't recognise the sovereignty of others. In that sense, all maps are political statements. Isn't that right, Hannes?

### **Hannes Reuter**

The United Nations have an opinion how they see the world. In the European institutions, we are bound what the Council decides here: which countries do we recognise? And which territories do we recognise or not recognise? A story from a couple of years ago, we had some students here, coming visiting us. We had presented what GISCO is doing and what we're doing here as part of Eurostat in our regional statistics and geoinformation unit.

And then they came up: "Ah, look here, we have a poster!" and I look at it. Ah thanks. Might you wonder what's wrong with that map? And it was before COVID, that happened. But South Sudan and Sudan separated in - when was it? - 2011, I think? They had just downloaded a country dataset from wherever and put it on a map. And this was still one complex, you know?

But I mean, now, sorry, there we have two different countries, there are even disputed areas in between these two countries by now. This is all coming where it becomes highly interesting, let's put it that way, where we need to be precise, and careful what we're doing. And this is what we're trying to provide, as Joe says, we're trying to provide tools to our colleagues, and datasets, which allows them to make these maps. For sure we make maps errors. For sure we cannot exclude that one. But I mean we can try to limit the issues we're making, for example.

### **Jonathan Elliott**

Joe, you've got a wonderful story about how "Barbie the Movie" got banned in Vietnam, this is true. I don't know if it's still banned, but certainly for a while it was banned - because of a map! In "Barbie the Movie". Can you tell us more?

### **Joseph Davies**

Yeah, well it's it shows the impact of the power of maps, doesn't it? Yeah. It was in the news. They essentially showed a map of the South China Sea, I think it was the Nine-dash line which, yeah, is disputed territory with China so they obviously picked up on that in the film and banned it.

So yeah, it's just an anecdote about how, you know, a seemingly innocent mistake can actually have serious consequences. So, of course, you know, we want everyone to use our official mapmaking tool to avoid any sort of discrepancies in borders or territories or any such thing.

### **Jonathan Elliott**

This is IMAGE, the interactive map generator, the mapmaking tool created by GISCO, to great acclaim. And we'll be talking more about that in a minute. But before we do, let me come to Konstantina here, who I guess... Konstantina, you have to handle a lot of sensitive political information. And that must include maps?

### **Konstantina Michalopoulou**

Actually, yes, because mapping is a very sensitive area. We've seen on social media that when we use a map of a country, as a graphical element, basically as a drawing of a visual, and for example, there are not there some outermost regions, people comment on that and criticise it. So, we are quite careful when we use maps, even if it is a simple drawing of a country.

### **Person on the street 7**

I think it's rather hard to do statistical data analysis on maps, especially when it comes to colour gradings. I mean, it's kind of dependent on how you want to show something on a map. So, I think statistical data on maps is not the best way to show something.

### **Jonathan Elliott**

It's just to talk a little bit about then the IMAGE mapmaking tool, which I think is probably one of the most interesting parts of all of this, which is that the cartographer is having to kind of give away all his and her secrets, and tools, and in fact make themselves redundant.

I mean, I'm sure that won't ever happen, Joe, but you've created this tool that allows people who are not experts and trained in the use of this particular kind of technology in that mapping, to create really, really good and really important maps for their own use. Just tell us a bit more about, well, first of all, tell us how it works.

### **Joseph Davies**

We try and share our expertise as much as possible. But again, we don't want to give this false impression that you can just throw your data at it, and it'll give you a map automatically. It is a very simplified process that is very easy to use, but there are some decisions that do need to be made by non-experts anyway. So yeah, we try and take them through the process, step by step, we have warnings, we sort of detect if a user might be making a mistake.

Then we try and warn them. We also have a checklist at the end, you know, you make a map, you want to download it. When you download it, it says, you know, make sure you check these points in our checklist that you haven't, fallen into any of these pitfalls. So yeah, it's just trying to make sure that the maps produced and published are as a higher standard as possible, and that mistakes aren't made, and the data isn't misleading, essentially.

I often use the same advice to a lot of people. I say, you know, once you've made a map, then consume it. So, look at your map, look at the values of the regions, look at the inter-regional differences. Are you getting what you want from the map? Can you decide whether that region in Germany has a higher or lower value than that region down south? So, yeah, that's what I often say to people is: consume your own map, don't just make it and then ship it off.

### **Jonathan Elliott**

Brilliant. Riccardo, we're going to come to you in a minute, just to talk about your use of the system, of the IMAGE system. But first of all, Hannes, with IMAGE, why did you feel the need to create this sort of DIY kit in the first place?

### **Hannes Reuter**

Look, initially, we wanted to give our policy officers the ability to make the maps themselves, you know, we have a service where we produce these maps for them. But we saw an increasing use of maps, and our service got loaded. So, we produced the self-service tool, which is called IMAGE. And again, image stands for interactive map generator, a nice acronym again, you know? And so, we have now, we try to really keep it KISS principle, try to bring down simplicity.

So, for example, in the last year, over 8 000 maps have been made with IMAGE, which is the ones we can track, we can see. You know, there's probably more have been created. And we as a service could have never made 8 000 maps in the last year. We still do maps, like, if you recall from previous podcasts on the regional yearbook, and statistical atlas.

We're making custom made maps for them, you know, but I mean, the standard map goes to four iterations, and we didn't have just the capacity. And that's the reason why people are using IMAGE and doing it themselves and we are just enabling them. This is our role - enable them to be self-sufficient and creating a map. For sure you can make errors. Like what Joe was saying. This was the idea behind IMAGE.

**Jonathan Elliott**

Yeah. So, you created IMAGE, one of the reasons because you were overloaded with requests to make maps? You were basically like a self-service checkout, it's like, come on, come on, come on back up, back up, just go and use the...please go over there.

**Hannes Reuter**

Yeah, exactly. And there's a point is, sorry, IMAGE is really, it's, as Joe said, it's restricted, has limited functionality. You know, if you want to be cartographer, go crazy, you have to use professional software.

**Joseph Davies**

The restrictive process is actually quite difficult sometimes, because, you know, we'd love to add loads of functionality to be able to make more and more different types of maps. But it's, I think it was da Vinci that said so: "Simplicity is the ultimate sophistication". It's very, you know, the more things you add, the more possibilities there are to make mistakes.

So, you know, we have on one side our goal of limiting the amount of mistakes a user can make, but on the other side, we want, you know, the widest range of maps possible to be able to be made. So, it's this balance between adding features and restricting features. So, every feature you add is another possible mistake, so...

**Person on the street 8**

Yeah, I think anything can be manipulated to spread misinformation, I think it's, it's not to do with the map, it's not to do with the graph or the table, it has to do with the source, isn't it? The fact that it's a map or a graph makes no difference if it's spreading misinformation. It's all to do with the author of the map or of the source as opposed to the physical media.

**Jonathan Elliott**

Well, there's one way to find out how easy IMAGE is to use. And that's by talking to someone who's come to it for the first time. And fortunately, we have someone right here who can do that very thing. Riccardo, talk us through your journey as a first-time cartographer, and user of IMAGE.

**Riccardo Sgaramella**

As you said, I started using the maps generator, by myself as a new user, for the sake of the report. We wanted to have as many maps as possible into the report. And last year with the previous edition, we wanted to make them as coherent as possible. So, this means that somebody, in this case it was me, need to go through each map and harmonise all of them. At the beginning, it was not easy, of course, as Joe said, you have a checklist, you have a limited use of the tool.

But still, you have to start from zero. And the first maps I created were horrible. Joe said: make them and consume them. I could not even consume them, because it was impossible to understand what I wanted to represent. So, I needed some kind of adjustment process. And then once I've managed to be a bit more experienced with the tool, I passed the ball to my colleagues, to the author of the sections, and I asked them to play around, to create their own map.

In some cases, colleagues were more connected to the tool, in some other case they didn't want to or possibly they were not ready for it. But I have to say that it was also a nice journey, because it also

gave me the understanding of what I was writing into the report. Because as we said, maps may complement what we say black on white, but in some cases, you just need a map to cut off one page of the report, because there is no need to be redundant.

So yeah, I would say that in our cases, the maps have been absolutely 100% important for the report. And as you said, it's been a process as a new user little by little to get accustomed to it and to be able to create good maps. And I have to say, many thanks to the colleagues in the GISCO team, because they really helped us on many occasions.

In some cases where data were not Excel data, were not completely fulfilled. Or in some other cases where you had two or three indicators, which were not possible to be created by me, these kinds of maps, they were kind enough to provide maps on themselves for our behalf. So yeah, I mean, this experience per se is 100% recommended, and it worked very well for us, for me.

**Jonathan Elliott**

I should just say quickly here, the IMAGE is available for the general public, isn't it?

**Joseph Davies**

It is available to the general public, but you're right, there are certain features that are restricted to EU staff.

**Jonathan Elliott**

And do the general public use it? I mean, are you getting feedback from people outside: schools, colleges, individuals, journalists, whatever?

**Joseph Davies**

Yeah, we've got a bit of feedback. And it's all been positive, thankfully. It's used for educational purposes quite a lot.

**Jonathan Elliott**

Great. Well, that's fantastic. That's a real service.

**Hannes Reuter**

And Jonathan, maybe just to jump in on Joe's point is what we have also added in the last year - we have translated it in all the EU languages. So now the people, not only the English-speaking community, but also different languages can use it in their native language.

**Jonathan Elliott**

Wow. Wow, that's fantastic. Well, that's a real bonus. Yes, please. Konstantina.

**Konstantina Michalopoulou**

In dissemination, we also use IMAGE to generate maps. And I would say that it's quite easy to use it, at least when you become a bit familiar with it. And the added value is that you can use directly the data from the data browser, or to insert them in an Excel format. For example, if you make calculations based on Eurostat data, then you can insert them in a map. Well, we don't do that. But if you are a policy officer or a user, if you work in a university and you do some research, this is quite useful.

**Jonathan Elliott**

Ok folks, unfortunately, we've run out of time, it only remains for me to say thank you very, very much to our contributors for a really stimulating and fun discussion. It seems like we only scrapped the surface on a lot of fascinating topics. But we also learned a very great deal. So, thanks to Konstantina Michalopoulou, statistical and communications officer at Eurostat. Thank you very much.

**Konstantina Michalopoulou**

Thank you.

**Jonathan Elliott**

Also, thanks to Riccardo Sgaramella, coordinator of the EU Annual Report on the State of Regions and Cities.

**Riccardo Sgaramella**

Thank you. Thank you very much.

**Jonathan Elliott**

Thank you very much also to Joe Davies, data visualisation specialist front end at GISCO.

**Joseph Davies**

Thank you, everyone.

**Jonathan Elliott**

And Hannes Reuter, also GISCO, statistical officer. Thank you.

**Hannes Reuter**

Thank you. Have a nice day. Bye. Bye.

**Jonathan Elliott**

Thank you, everybody, for a wonderful discussion, very, very stimulating.

If you'd like to see how maps are created with the GISCO mapmaking tool, then there is a recording of a recent webinar on that very subject that reveals all. It's available at the Eurostat website and on YouTube. Do check it out.

If you've enjoyed Stats in a Wrap, don't forget to follow us on social media and share our adventures with friends and colleagues, where the show can be found on Spotify, Apple, Google and all the usual places. And of course, join us in June when we'll be dishing up more flavoursome insights from Eurostat. This time about the European Parliamentary elections and fact-checking in the media. Join us then but for now, goodbye.