CHISU Results in Action

Automating visualizations of geospatial data for better public health decision making in Serbia

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Background

Visualizations of geospatial public health parameters are essential for understanding available data and producing high-quality reports for decision makers. Some of these public health parameters include the number of doctors over a certain age and the number of administrative nonmedical staff per 100,000 population, for example.

These public health parameters serve different data needs for the country. For example, the Serbian population is aging—so it's crucial for decision makers to see the geospatial distribution of doctors above a certain age to understand what parts of the country have an aging workforce. Serbia's Institute of Public Health (IPH) Batut's ability to easily display such parameters is an integral part of its work, and it's therefore essential that the process of creating these geospatial visualizations be as efficient as possible.

But staff at IPH Batut previously had to use free software with limited capabilities to do this work—and data processing required to make these visualizations was completed by a single individual. This person needed approximately an entire work day to complete this task because everything was done manually.

Steps Taken

Through efforts at the IPH Batut, two major processes have been automated in the country: visualizations of geospatial data pertaining to public health and the processing of data obtained from the Statistical Office of the Republic of Serbia (known as the *Republicki Zavod za Statistiku* in Serbian, or RZS for short).

To automate these processes, a CHISU consultant developed custom software (called IPH Batut MapGenerator) with guidance from IPH Batut to make sure it addressed their

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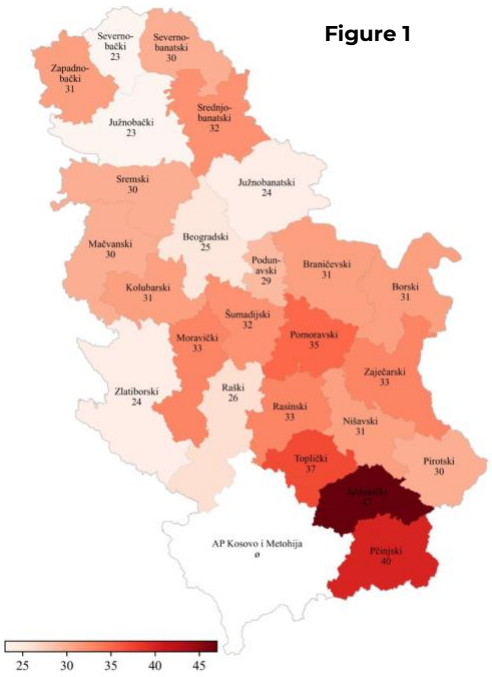
needs. For example, in the newest iteration of the software, IPH Batut requested that Times New Roman be the font used on the maps in order to be consistent with IPH Batut documents that use that font. The new software's user interface is characterized by its user-friendliness, intuitive design, publication-ready outputs, and compatibility with standard table-making software such as Microsoft Excel.

Figure 1 illustrates an example of the IPH Batut MapGenerator's output and shows the distribution of the proportion of employed medical doctors over the age of 55 in each region of Serbia. It illustrates the higher percentage of doctors over the age of 55 in the southern regions of Serbia and the comparatively lower percentage of doctors over age 55 in the northern regions.

Figure 1



Map showing the percentage distribution of doctors older than 55 out of all doctors in a given region; "Ø" indicates no data available.

The second component of the automation work was MapGenerator's processing of data obtained from RZS. This pertains to the processing of population data into age categories in accordance with the requirements of IPH Batut.

Results + Next Steps

With the MapGenerator custom software, virtually anyone at IPH Batut can harness the benefits of geospatial visualization, which produces publication-quality images and a standardized way of displaying geospatial data. An example of the new map visualizations can be seen in the latest IPH Batut edition of the statistical yearbook (published in 2023).

For the data processing, only minimal preprocessing is now required in Microsoft Excel to convert the data into the required format—and only one click is required to import the data and perform the calculation in MapGenerator. This refers mainly to the data obtained from RZS, and this feature has been very well received by all IPH Batut employees.

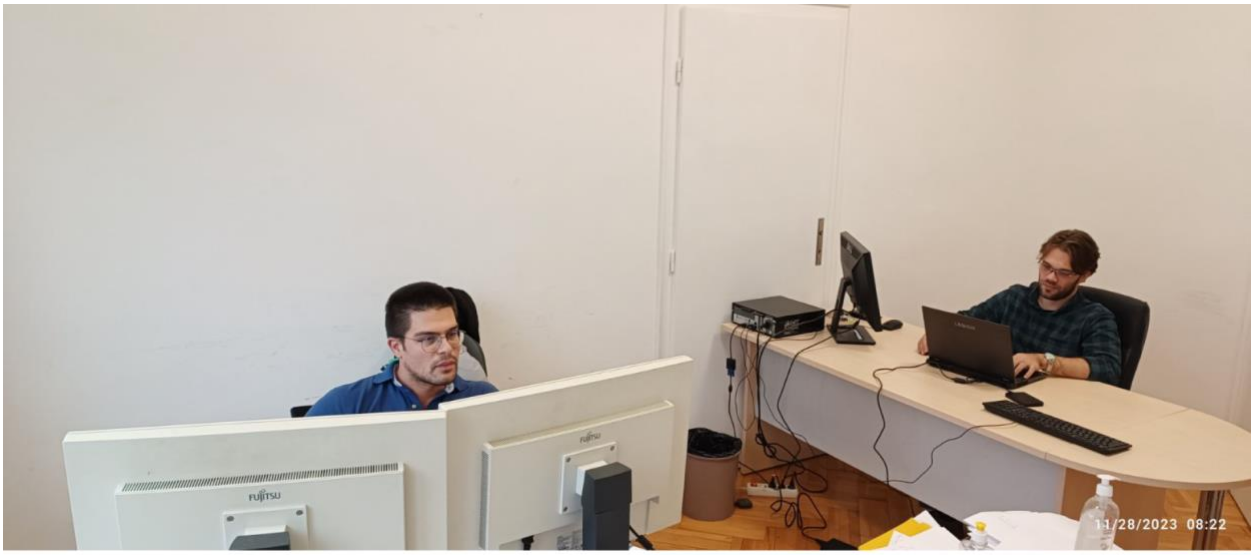
In previous years, employees used a large data table in which each individual "cell" corresponded to a given age group and a given region in Serbia. There are 15 age groups (and gender groups) and 25 regions for a total of 375 individual calculations that were done manually, and are now available to IPH Batut employees at the click of a mouse.

The IPH Batut MapGenerator software represents an improvement over the previous approaches used by the institute for visualizing public health data. The combination of mapping tools and Excel inputs expedites and simplifies the process of generating health-related maps.

“I believe that this software provides an improvement, as previously (from what I have heard) the map-making process was not defined, and the tools used were non-standard and more time was expended to such tasks,” said Filip Arnaut, the CHISU consultant who developed MapGenerator. “The software is made so that the user can relatively quickly make the desired map in a standardized form.”

And the advantages of spatial visualization surpass mere efficiency; they grant health practitioners the ability to identify patterns and correlations within the data in an easy and intuitive way. In addition to the statistical yearbook where use of the software has already been implemented, it can also be used to generate internal and external reports encompassing regional-level public health data.

“This is a system that enables significantly better visualization of health data, as well as their use in the creation of graphs and other publications,” said Ivan Ivanovic, Acting Director of IPH Batut. “It also enables comparative comparisons with EU health data with maps.”



Martin Jovanovic (left) and Filip Arnaut (right) work on everyday activities in coordination with IPH Batut

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