Developed by the GeoVISTA Center in close cooperation with users at the National Cancer Institute, the ESTAT toolkit provides user-friendly, open-source software designed to support exploratory geographic visualization. NCI requested an application that could explore multivariate data across space and time in a dynamically-linked environment. Our colleagues at NCI see a need for tools like ESTAT to explore increasingly massive amounts of digital health data. While developed initially to support cancer research, ESTAT is designed to handle any kind of spatial data with attributes.

ESTAT includes a scatterplot, bivariate choropleth map, parallel coordinate plot (PCP), and a time series graph. Each tool is dynamically linked so that brushing over one view populates to the other views. Data selections and color assignments are also linked in ESTAT. These tools have been developed as Java Beans for use in GeoVISTA Studio – a codeless visual programming environment designed to facilitate the creation of geovisualization applications.

**Usability in Practice:**

ESTAT has evolved (and continues to evolve) through a series of formal and informal usability efforts. In conjunction with NCI, we have worked closely with epidemiologists and other potential users to assess ESTAT. Our efforts have included a wide array of techniques designed to elicit knowledge, understand interaction, and resolve problems.

Our goal is to refine ESTAT into a toolkit that is employed regularly in epidemiological work. Additionally, we are already using some of the knowledge we have gathered from our usability work to feed into the design of new applications using GeoVISTA Studio and future enhancements to the Studio environment itself.

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