Making progress in epidemiology through interactive storytelling

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If asked about my favourite high school teachers and university professors, I would not nominate those who appeared to have accumulated the biggest knowledge base, nor those who mastered the most complex subjects and disciplines. The lecturers that I liked most, were the best storytellers. Be it Alexander the Great's conquest of the Persian empire or the tales of injury or abuse unveiled by the subtle shades of grey and white on X-ray and CT-scan images; those who could make the subject matter come alive had my undivided attention and admiration.

In the same way, policy makers, fellow scientists and media reporters are more likely to pay attention to and consult with epidemiologists who are able to articulate new research findings through a captivating narrative, a vivid mental picture or a striking infographic. The SACEMA Quarterly itself provides us with plenty of opportunities to hone our skills of scientific storytelling. As Brian Williams argues in his article on narrative and paradigms in scientific thinking, we ought not underestimate the value and importance of narrative thinking in science, especially when the purpose of the scientific endeavour is to address development and public health problems.

It is, however, not only in our interactions with policy makers and other consumers of our analyses that storytelling is crucial for "getting the message across". Within our collaborations with fellow epidemiologists and our supervision of (graduate) students, we can and should leverage the power of storytelling as well. I am not merely referring to visually appealing and perhaps even entertaining syllabi and PowerPoint presentations. The IPython notebook, Google Trendanalyser, R Markdown and Shiny apps are examples of recent software developments that have made it easy to produce web applications and reports that dynamically combine text, mathematical expressions, code chunks and the numeric or graphical output of complex computations.

The result of these new platforms is that researchers can adopt a more engaging, interactive form of storytelling. Anecdotal evidence from my own experience with the use of R Markdown and Shiny apps suggests that interactive storytelling automatically leads to readers and viewers engaging more intensely with the presented data, models and assumptions. Consequently, deeper and more interesting questions emerge from the ensuing discussions.
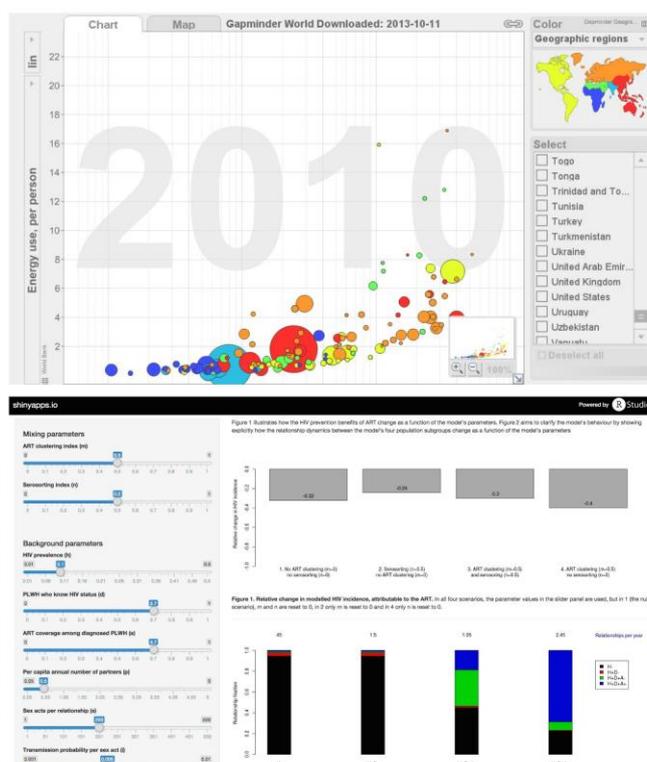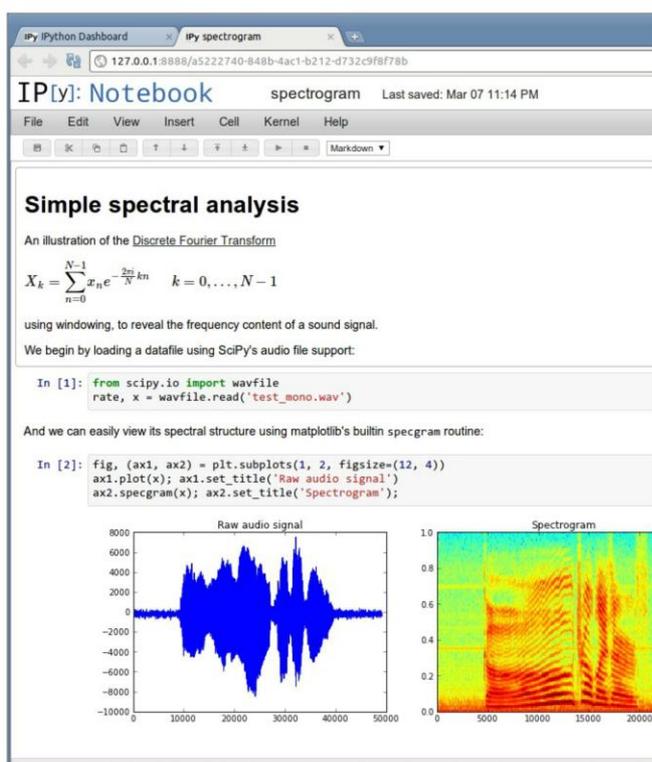
Screenshots of an IPhython Notebook, Trendanalyzer and R Shiny application.

Interestingly, storytelling in epidemiology also takes place at the deepest, most intimate level of investigation. One example is an increasingly popular technique for fitting complex stochastic simulation models to empirical data: Approximate Bayesian Computation (ABC). ABC is, at its core, an example of automated storytelling. When the model is run with a set parameter values, drawn from a (naïve) prior distribution, the simulation output can be viewed as one of many narratives that originates from the model. This narrative is then compared to "the grand story", i.e. summary statistics of the empirical data, and pre-defined criteria are evaluated to determine to what extent the model-based story is consistent with the previously observed grand story. Inconsistent stories are rejected and replaced with new ones, originating from a slightly different set of model parameters. This process is continued until a (narrow) subset of the parameter space is identified that produces narratives that are in line with the empirical data.

This issue of the SACEMA Quarterly is packed with articles that tell engaging stories of recent advances in epidemiology. I thank the authors for their enduring commitment to writing high-quality stories that make their scientific insights accessible to a wider audience, and I am hopeful that the technological advances in interactive scientific storytelling will translate into deeper and broader discussions of the challenges and solutions in epidemiology and public health.

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