Connecting Digital Humanities and Medical History through the *Viral Networks* Workshop and Edited Volume

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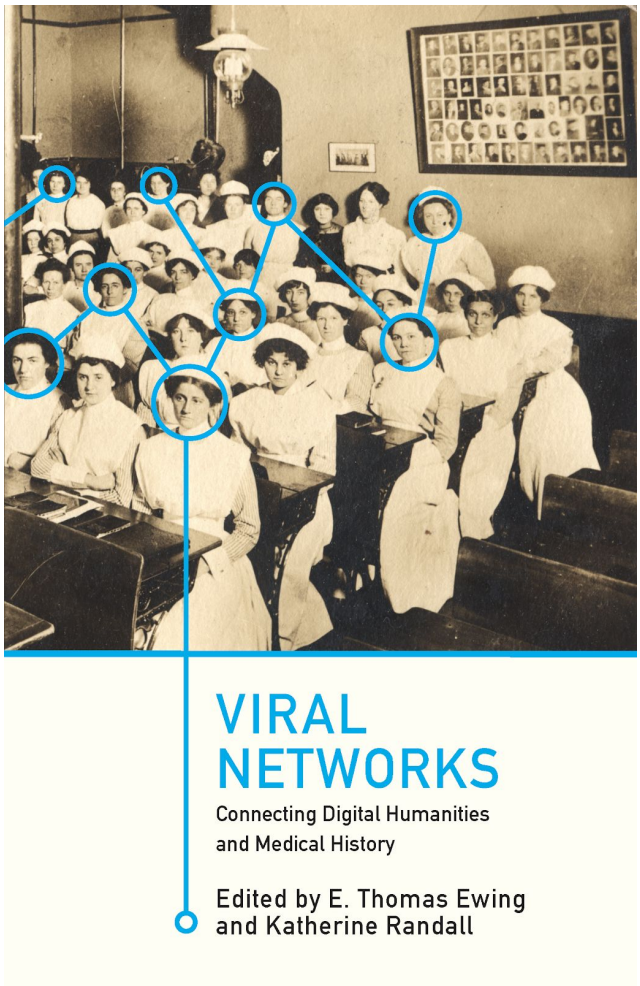


The Viral Networks workshop brought together contributing scholars, consulting scholars, librarians, data scientists, and staff for a two day workshop hosted by the History of Medicine Division of the National Library of Medicine (NIH) and organized by Virginia Tech. Most of the pre-circulated papers discussed at the workshop were revised through a review process for an edited volume that included ten chapters of original scholarship, a preface, an introduction, and a method section about network analysis. The co-edited volume (Illustration 1) was published as a free, open access electronic book and also as a print book. The electronic book is available from the VT Publishing website and also deposited in NLM digital collections. The workshop and the volume fulfilled the project goals of bringing together scholars working at the intersection of digital humanities and medical history, publishing a volume of original scholarship broadly available to public and expert audiences, and demonstrating an innovative approach to collaboration, research, and publication in the digital humanities.

Why Viral Networks?

The name of the workshop and volume, Viral Networks, signifies the intention to see networks as an object of study, a tool for analysis, a framework for collaboration, and a means of scholarly communication. The scholars involved in this project examined networks in medical history even as they became participants in a network of scholars engaged in collaborative learning. Inspired by models of networked pedagogy, the workshop involved these scholars in a connected series of activities that began with reading proposals, included one face-to-face and two virtual conferences, and ended with final edits on revised chapters. This collaboration helped address many of the issues that came up for each author as they wrote for a wider audience, including questions about how much historical content to include or cut in order to focus the paper on methodology. In essence, the authors in this collection spent months of time not only on their

own papers, but on guiding and critiquing the papers of their co-collaborators. The papers should therefore be understood and read as a fully networked project, not as chapters written individually and placed together.

The tools of network analysis made possible by the digital humanities were enhanced by more traditional humanities methods of close reading, contextual analysis, and layered interpretation. Each chapter author was a node in this network, connected to the other authors by the experience of reading, editing, and evaluating each others' work, yet also connected by the shared experience of using networks as a tool for historical analysis. Finally, each author studied the operation of networks in medical history as a relationship among ideas, people, institutions, or language. The Viral Networks workshop created a relationship among scholars working collaboratively toward a shared outcome of understanding the place and significance of networks in medical history by integrating approaches from the digital humanities and network analysis. The Viral Networks project marks the convergence of three important trajectories: first, the fact that networks are an essential aspect of living the human experience; second, the development of more accessible and powerful network analysis tools; and third, the opportunity to make scholarship more collaborative and accessible through digital humanities tools.

As illustrated in the chapters listed in the table of contents of Viral Networks, networks were an essential aspect of the human experience in the form of communication between individuals, the operation of medical teams, the debate over the meaning of concepts, the use of tools for diagnosis and treatment, and personal appeals based on shared narratives of experience and established frameworks of order. Networks were central to the human experience; studying networks is thus an essential tool and step in the process of understanding the human experience.

Recruitment of contributing scholars

A call for proposals was drafted in October 2017, and circulated widely across email lists, postings on relevant organizations, and especially through the social media platform of Twitter. News releases from the National Library of Medicine and Virginia Tech further amplified the call for proposals. The project director sent a series of tweets that included images of networks from the digital collections of the History of Medicine Division of the National Library of Medicine that sought to call attention to this innovative project. Approximately fifteen proposals were submitted by the deadline. From this pool, twelve authors were invited to take part in the workshop. The participating authors were offered lodging as well as travel bursaries to offset the cost of attendance.

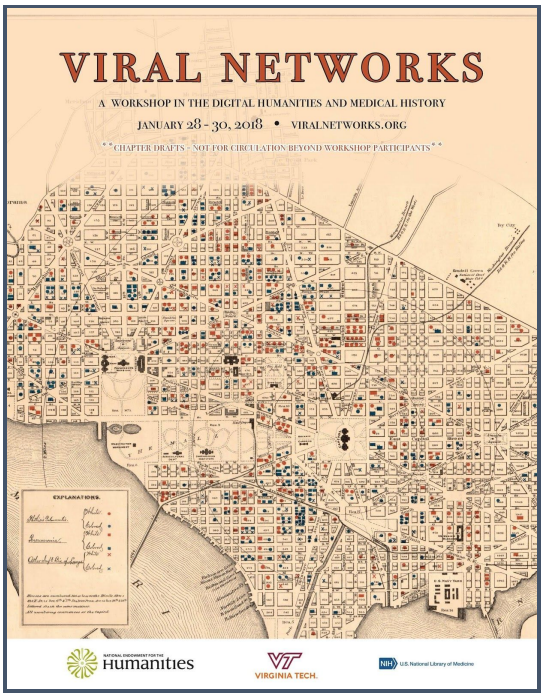
First Virtual Meeting

The twelve contributing scholars participated in a virtual conference using Zoom in December, about one month prior to the workshop. The proposals submitted by each author were circulated to the whole group, so the scholars knew about each others' topics. One of the topics discussed at this first virtual meeting was how the workshop could introduce tools that the authors could use as they developed their papers.

Consulting Scholars

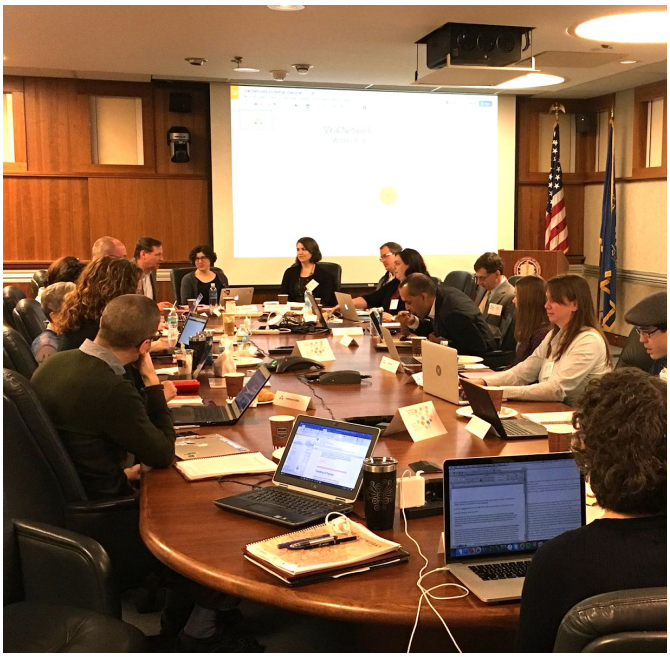
Three consulting scholars: Amy Nelson, of the Department of History at Virginia Tech, Ryan Cordell, of the Department of English at Northeastern University, and Samarth Swarup of the Biocomplexity Institute at Virginia Tech, were selected because of their unique, but also

complementary, approach to thinking about networks as pedagogical strategy, research tool, and public engagement.



Workshop at the National Library of Medicine

The Viral Networks workshop took place on January 28-30, 2018, with participation by twelve contributing authors selected after submitting proposals for papers. One week prior to the workshop, the twelve submitted papers were made available to all workshop participants through a shared drive. In addition, the draft papers were printed and bound together in a volume that was brought to the workshop for distribution to all participants (Illustration 3). The workshop began with presentations by the consulting scholars who introduced concepts such as networked learning as a teaching strategy, networked authorship in the history of journalism, and network analysis in computational epidemiology. The second day of the workshop featured discussion of each of the twelve papers (Illustration 4). The keynote speaker, Theresa MacPhail, discussed the research for her book, *Viral Network,* as an example of networked analysis of disease outbreaks. The afternoon session included discussion of the remaining papers. On the third day, the contributing authors and others discussed plans to move the papers toward publication. In addition to the contributing authors and consulting scholars, other participants included Katherine Randall, from the Virginia Tech Department of English, Peter Potter and Nathaniel Porter, from Virginia Tech libraries, Jeffrey Reznick, Kenneth Koyle, and colleagues from the History of Medicine Division, and several researchers from the National Center for Biomedical Information at the National Library of Medicine.



Discussion of network tools

During the workshop, participants discussed the selection and application of network tools most relevant to their fields of study. This discussion allowed data scientists from Virginia Tech and the National Library of Medicine to offer specific suggestions about the use of tools. The

discussion also allowed the contributing authors to describe their data, to raise questions about the use of tools, and to make decisions about the utility of these approaches. Most importantly, the discussion allowed both sides to appreciate the opportunities as well as challenges of applying network tools to the study of the history of medicine.

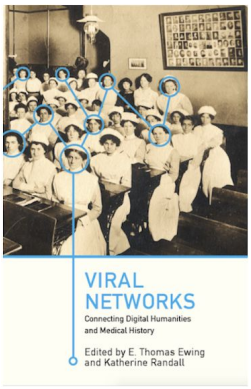
Data consultation
Nathaniel Porter, the Social Sciences Data Consultant at Virginia Tech University Libraries, attended the workshop, where he provided guidance to the individual scholars. Following the workshop, he worked with colleagues from University Libraries to develop data visualizations that advanced the scholarship in this volume. He also worked with the chapter authors to develop data visualizations that were illustrations in the book and are also available online in full size and even dynamic formations. Finally, Porter contributed a chapter that discusses the advantages of integrating network analysis with humanities scholarship.

Revised chapters
Following the workshop, the contributing authors were given guidelines to revise their papers for inclusion in an edited volume. Ten authors decided to continue the next steps toward publication. Each author revised the draft substantially, drawing on the discussion at the workshop as well as recommendations about integrating network analysis into their projects. All of the revised drafts were submitted in early March. Two conference calls allowed all the authors to discuss their papers with each other and with the editors, Tom Ewing and Katherine Randall. Once the chapters had been fully revised, the entire manuscript was sent to two scholars who had participated in the workshop but had not written chapters. Their comments were then incorporated by the editors into a final set of revisions sent to each chapter author, who then submitted their final versions in preparation for publication.

VT Publishing
Even before the workshop began, the project director began working with a new initiative, Virginia Tech Publishing, on a plan that would meet the goals of the project: to make original scholarship widely available on a platform that exploited the opportunities of the digital humanities. More specifically, VT Publishing committed to produce a volume that was open access, available in both print and digital forms, and widely disseminated. Robert Browder from VT Publishing coordinated the steps leading to publication, including working with the co-editors on the chapter order, discussion options for illustrations, and clarifying expectations from authors. Once the final manuscript was completed, Browder coordinated the steps toward publicating, including copyediting, layout, and final production. Browder also directed the preparation of multiple versions, including a pdf version available for download as a complete manuscript or by chapter, an epub version available for free from the website, and two print versions, one in color and one in black-and-white, available as print on demand.

Cover Design
The cover was designed in a way that connected the diverse content of the chapters, the purpose of the volume, and the innovative approach of the project. The cover photograph of a training school for nurses in Illinois provides evidence that networking in medical history is neither a new phenomenon nor a product of visualization tools. Professional associations of nurses and

physicians, conferences, and training programs have emerged over the centuries as ways to connect medical personnel, patients, and the general public. The more formal gathering of illustrated in this photograph became increasingly widespread in nineteenth and twentieth centuries, and serve in some ways as a model for the Viral Networks workshop hosted by the National Library of Medicine, funded by the National Endowment for the Humanities, and organized by Virginia Tech. The photograph reminds readers that even in a digital age, tremendous value remains in the capacity to bring participants together in a single room, to discuss common research interests, to learn from experts and from each other, and to leave the session better educated and more committed to professional activities. Once the image was selected, the co-editors worked with VT Publishing to design the cover.



Publication

Viral Networks was published in December 2018 in simultaneous electronic and print versions (Illustration 5). The electronic version is available from the VT Publishing website in both ePub and downloadable pdf versions. The book is also available from print on demand vendors, including Amazon, which offers the book in two versions: color ($34.32) and black-and-white ($7.06). The pdf version of the book was deposited in NLM Digital Collections (Illustration 6). The book has an ISBN (978-1949373004) as well as a DOI (10.21061) as do each of the chapters. The VT Publishing site also has a link to data visualizations.

Dissemination

As of May 2019, the entire book had been downloaded 129 times and individual chapters have been downloaded 202 times. The ePub version has 99 views of the entire book and 47 chapter views. The VT Publishing site has been mentioned in 125 tweets (Illustration 8). Twenty print copies of the book were sent to major medical historical libraries in the United States to be added

to the stacks. World Cat lists print and electronic versions. In April, flyers about the book were distributed at the History of Medicine Division at the annual meeting of the American Association for the History Meeting. Viral Networks, Reconnected, in April 2019 brought together three contributing authors and the two co-editors to discuss the book at an event hosted by the National Library of Medicine. Announcements about the publication of the book have been released by Virginia Tech University Libraries and the National Library of Medicine. Finally, the editor continues to tweet about the book, with links to the VT Publishing website, thus ensuring that networks continue to work to advance the goals of this project.