

Network Approach to Evaluate Scientific Collaboration In a Clinical and Translational Research Program

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Background: Clinical and Translational Research Centers promote scientific collaborations. The Puerto Rico Clinical and Translational Research Consortium (PRCTRC) was established by the three main medical academic institutions as a centralized infrastructure for clinical and translational research in health disparities across Puerto Rico. Since September 2010, PRCTRC has encouraged collaborations among basic, clinical, strategic scientists, community networks, and health programs.

Scientific collaborations involve interpersonal interactions. However, traditional evaluation analytical approaches emphasize examining the influence of individual attributes and behaviors. Social Network Analysis (SNA) has the potential of contributing interpersonal-level data to the analyses of scientific collaborations. SNA methodologies have increasingly been used in the evaluation field to assess social relationships and networks.

In the evaluation of scientific collaborations, SNA has focused in examining co-authorship in publications. Scientific collaborations, however, may initiate further back in time with proposal writing and sharing of research resources (e.g., sharing lab specimens). The primary objective of this study was to assess the extent to which PRCTRC fostered scientific collaborations among supported scientists and their institutions. We have broadened the operational definition of collaboration to encompass grant writing, sharing of resources, and report writing.

Scientific Collaboration Within PRCTRC

- Collaborating in a grant/proposal that use PRCTRC support and/or resources.
- Sharing participants/volunteers in a study which is receiving PRCTRC support.
- Sharing of human resources (ex. nurses, medical technologist, lab technician, etc.).
- Sharing biomedical samples.
- Sharing equipment or technology.
- Sharing databases.
- Joint publication of study manuscripts.

Methods: In this study scientific collaboration was defined as two or more researchers working together in one or more of the following: grant proposal development, peer review publication, shared use of resources (e.g., biomedical samples, live patients, recorded information, staff, or research technology). Data on collaborations were collected from multiple sources (e.g., biographical sketches, grant proposal applications, NIH RePORTER, PubMed Central, PRCTRC application form, and PRCTRC study progress report). UCINET V.6 and NetDraw were used to analyze and map the networks resulting from collaboration interactions.

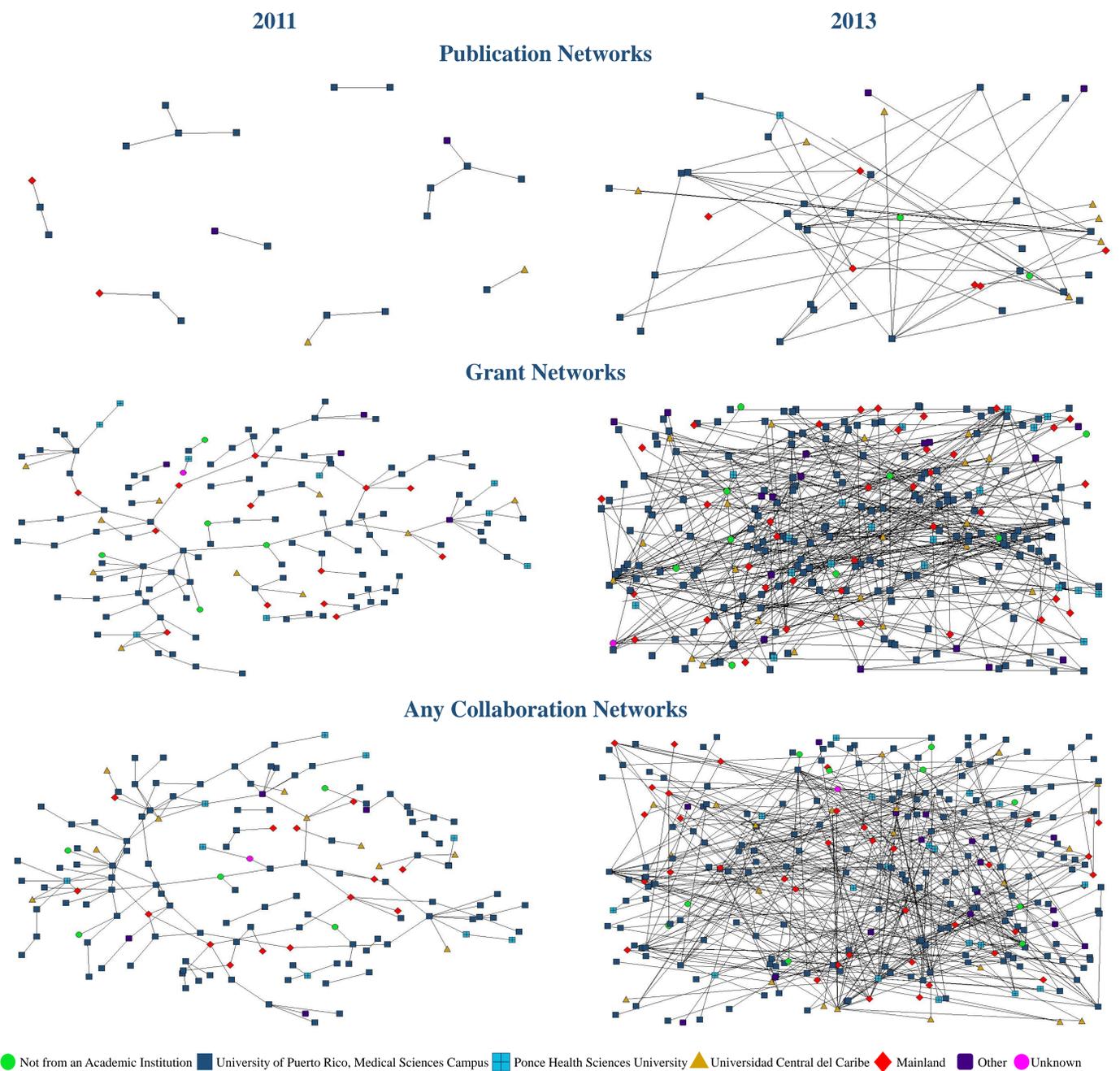
Findings:

- A total of 389 active investigators (e.g., Principal Investigators, Co-Principal Investigators, Collaborators, Mentors, and Consultants) were part of this study, including 170 investigators on 2011 and 313 on 2013.
- Collaborating investigators increase from 69 in 2011 to 105 in 2013, an increase of 52.2%.
- Collaboration connections increase from 268 in 2011 to 644 in 2013, an increase of 140.3%.

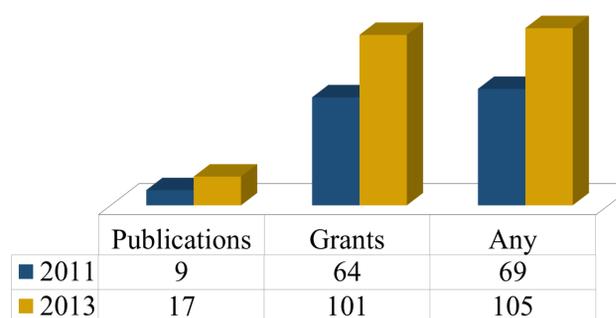
Discussion: This study documented substantial increased in scientific collaboration in the PRCTC from its initial year of establishment to its third year. The increased in collaboration were observed in grant proposal as well in publications. SNA approach proved useful in characterizing collaboration interactions and in the depiction of the resulting collaboration structures. Further analyses will be directed to examining other network characteristics (e.g., density, centrality, components) of the collaboration structures.

Study Limitations:

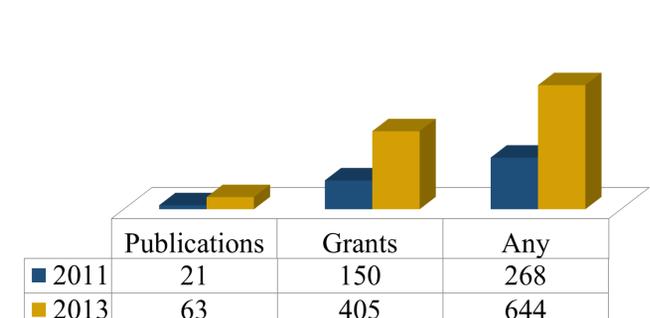
- Changes in project forms may have increased the number of collaborations reported.
- The methods used to document collaborations may not have detected all collaborations.
- This study design does not permit us to ascertain the portion of change in collaboration attributable to the PRCTRC.



Number of Collaborators (Connected Nodes) by Year



Number of Collaboration Interaction (Edges) by Year



References:

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