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## Abstract

### **Title: Understanding complex research-related relationships in public health: a Social Network Analysis (SNA) in Medway**

Authors: Maja Niksic, Lindsay Forbes, David Whiting, Kate Day, Mark Hill, Sarah Hotham

**Background:** Local government is traditionally not research active. NIHR Health Determinants Research Collaboration Medway aims to develop research capacity and culture within Medway Council to improve the evidence base for interventions, and in turn improve health and wellbeing. Voluntary, Community, Faith, and Social Enterprise organisations (VCFSE) are essential to involve in this as representatives of communities, especially those that are underresearched. To understand levels of current research activity, we carried out a rapid social network analysis of research-related relationships of Medway VCSFE organisations. We drew a relationship map to discover patterns of interaction between these organisations, to identify where research links are weak or strong.

**Methods:** We developed a novel questionnaire about research collaborations, including closed questions identifying the frequency and quality of research relationships, and open questions exploring research priorities, gaps, and improvements. We invited participants from VCFSE to complete the questionnaire via structured interviews, via Teams or in-person. The sampling frame was a database held by Medway Council, but we enhanced the sample size using a snowballing approach. We analysed quantitative data using SPSS v.29 and free text data using Framework Analysis (Ritchie & Spencer, 2004). To generate relationship maps, we used Gephi (Bastian, et al, 2009), and estimated influentiality of nodes based on three centrality values i.e., degree, closeness, and betweenness centralities.

**Results:** In developing the questionnaire, we reached a meaningful definition of 'research' (Table 1) because this emerged as an area without a shared meaning in piloting. We interviewed 15 people from VCFSE sector. Most participants (68%) were research-active, i.e., said their teams had been involved in research projects over the last 2 years, and felt that this research was a productive collaborative partnership (69%). Figure 1 shows that leaders in the network are University of Kent, Medway Council, and MVA (Medway Voluntary Action), with the highest degree centrality, i.e., a large network of research connections displaying 'information centrality', closeness, and betweenness centralities. Smaller or less well-connected organisations typically conduct research by themselves, e.g., Second Chance Crisis Support, Housing Justice - were considered less influential.

**Conclusions:** SNA offers a useful lens to examine the relational ties. There is an active research culture in Medway VCSEF sector with a commitment to 'sharing the power and knowledge' to improve the wellbeing of people in Medway. Future studies should assess a wider number of organisations within different sectors, their willingness to build research partnerships and barriers to research-related relationships.

Keywords: Social Network Analysis, public health, Voluntary sector (limited to 3)\*

Table 1. Definition of research, with three main components, including research projects and activity both inside and outside of an organisation where a person works in

Research is the <b>creation of knowledge to give new insights</b> into our understanding of the world (and beyond).
<p>The word research is used fairly loosely in everyday language. However, for the purposes of this survey, a ‘research study’ is an activity:</p> <ul style="list-style-type: none"> <li>• that’s designed to address a specific problem, using questions and methods set out <b>before the research starts</b></li> <li>• in which the results are interpreted in the light of <b>any limitations</b> of the methods used</li> <li>• that is reported fully allowing others to <b>scrutinise the methods</b> used</li> </ul>
This may include <b>evaluation of services</b> .

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**Figure 1 Existing research links in Medway within the Voluntary, Community, Faith, and Social Enterprise Sector**

