



Exploring the use of social network analysis to measure communication between disease programme and district managers at sub-national level in South Africa



Mary Kawonga^{a, c, *}, Duane Blaauw^b, Sharon Fonn^a

^a School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

^b Centre for Health Policy, School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

^c Department of Community Health, Charlotte Maxeke Johannesburg Academic Hospital, Johannesburg, South Africa

ARTICLE INFO

Article history:

Available online 23 April 2015

Keywords:

South Africa
Disease control programme
Decentralisation
District
Health system
Administrative integration
Monitoring and evaluation
Social network analysis

ABSTRACT

With increasing interest in maximising synergies between disease control programmes (DCP) and general health services (GHS), methods are needed to measure interactions between DCP and GHS actors. In South Africa, administrative integration reforms make GHS managers at decentralised level (district managers) responsible for the oversight of DCP operations within districts, with DCP managers (programme managers) providing specialist support. The reforms necessitate interdependence, but these actors work together ineffectively. Communication is crucial for joint working, but no research to assess communication between these actors has been done. This study explores the use of social network analysis (SNA) to measure the extent to which programme and district managers in South Africa communicate, using HIV monitoring and evaluation (M&E) as an exemplar. Data were collected from fifty one managers in two provinces during 2010–2011, to measure: a) one-on-one task-related communication – talking about the collation (verification, reporting) and use of HIV data for monitoring HIV interventions; and b) group communication through co-participating in management committees where HIV data are used for monitoring HIV interventions in districts. SNA measures were computed to describe actor centrality, network density (cohesion), and communication within and between respective manager groups. Block modelling was applied to identify management committees that connect respective manager groups. Results show HIV programme managers located at higher level communicated largely amongst themselves as a group (homophily), seldom talked to the district managers to whom they are supposed to provide specialist HIV M&E support, and rarely participated with them in management committees. This research demonstrates the utility of SNA as a tool for measuring the extent of communication between DCP and GHS actors at sub-national level. Actions are needed to bridge observed communication gaps in order to promote collaborative monitoring of HIV programme interventions within districts.

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1. Introduction

Health systems in many low- and middle-income countries (LMICs) have been characterised by tensions between disease control programmes (DCPs) that address specific diseases (vertical approach) and general health services (GHS) that cater for a

wider range of diseases (horizontal approach) (Mills, 2005). The number of DCPs in LMICs has increased significantly in the last two decades, in the wake of unprecedented increases in funding for the control of priority diseases such as HIV and tuberculosis by Global Health Initiatives (GHI) (Brugha, 2008). Tensions arise when dedicated systems established for DCPs – for example drug delivery, finance, or human resources – run parallel to GHS and cause fragmentation in the delivery and management of health services (Marchal et al., 2009; Travis et al., 2004). Various ways of addressing fragmentation are proposed – for example through better integration (Unger et al., 2003) or the so-called ‘diagonal’

* Corresponding author. School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, 27 St Andrew's Road, Parktown, 2193, Johannesburg, South Africa.

E-mail address: mary.kawonga@wits.ac.za (M. Kawonga).

approach (using disease interventions to drive system-wide improvements in GHS) (Sepúlveda et al., 2006).

Integration is sometimes viewed as integrating the delivery of two or more DCPs at the point of care (e.g. HIV within family planning services) (Spaulding et al., 2009). However it can also refer to providing DCP interventions within multi-function general services (operational integration) and integrating the management of DCP operations within GHS management (administrative integration) (Unger et al., 2003). DCPs can also be integrated within GHS governance, planning, financing, and monitoring and evaluation (Atun et al., 2010). In this paper we focus on administrative integration, which Unger et al. (2003) conceptualise as transferring authority for managing DCP operations to GHS middle managers, and re-defining DCP middle managers' roles to providing technical support rather than managing operations. This notion of integration aims to enhance coherence in service delivery without losing specialisation. Therefore it does not mean abolishing DCP actors – who are needed to ensure technical efficacy – but rather requires them to support and work collaboratively with GHS actors (Unger et al., 2003). The collaboration spectrum has been characterised as ranging from no integration, through communication, co-operation [joint work], formal collaboration, to full integration (Konrad, 1996). Using a case study of HIV monitoring and evaluation (M&E), we analyse communication between DCP and GHS managers in South Africa, where health reforms support administrative integration.

2. Background

2.1. South Africa context

In South Africa, several DCPs have existed alongside GHS for some time (Harrison-Magochi, 1998). Integration is promoted along with decentralisation reforms which aim to transfer authority to GHS managers at lower levels of the health system. Health policy and legislation promote devolution of authority from national level to nine provincial governments (Republic of South Africa (1996); Department of Health (1997)) and the further deconcentration of authority to smaller administrative areas termed health districts (Republic of South Africa (2003)). Since the 1990's district health management teams have been instituted in districts (Hall et al., 2005), and in 2003 a lower administrative level (sub-district) was established (Republic of South Africa (2003)). Concurrently, driven by the high rates of priority diseases such as HIV and tuberculosis (TB), DCP management structures have been established at provincial level since the 1990's (Harrison-Magochi, 1998), and since 2003 some DCP managers have been located within districts. According to the health reforms, GHS managers at district level (referred to as district managers in South Africa) are supposed to manage health services within districts (including programme interventions) (Department of Health (1997)), while DCP managers (referred to as programme managers from here on) are supposed to provide them specialist support (Harrison-Magochi, 1998). These actors are supposed to work together but have failed to do so, often planning, supervising and monitoring services in silos (Kawonga et al., 2013; McIntyre and Klugman, 2003; van Rensburg et al., 2008). Poor role clarity and contestation over authority and resources have impeded joint working (McIntyre and Klugman, 2003).

Communication is crucial to foster joint working between programme and district actors, but research to assess such communication has not been done. This paper describes communication between programme managers within the HIV programme (our chosen DCP) and district managers. The HIV programme constitutes one of the biggest DCPs in South Africa

and forms a significant part of health service delivery, but is progressively being integrated within GHS (Department of Health (2014)). These arrangements provide a unique opportunity to analyse interactions between programme and district managers. We use M&E as a tracer because M&E is a crucial part of assessing if services are functional and meeting their aims (Nutley, 2012), and requires programme and district managers to perform interdependent tasks. HIV M&E tasks include: HIV data collation (verifying data, compiling and submitting reports); and HIV data use (reviewing HIV indicators, deriving implications for services, and making decisions based on these). Working inter-dependently on HIV M&E might mean district managers collate HIV data and use HIV indicators to monitor services, while programme managers support them to verify and interpret HIV data and derive appropriate implications for HIV service delivery and quality. A previous study however shows HIV managers (who have HIV M&E expertise) use HIV data in silos and seldom support district managers to use data optimally for monitoring HIV interventions (Kawonga et al., 2013). Other research shows poor dialogue between these actors in the planning of HIV interventions (Van Rensburg et al., 2008) but there are no studies on their communication regarding HIV M&E. Previous research has also been primarily qualitative in approach and thus it is not easy to monitor if the degree to which these actors communicate has changed over time. This research explores if a quantitative approach – social network analysis – can be applied to quantify the extent of communication between programme and district managers.

2.2. Social network analysis

A network refers to a set of actors joined in one or more inter-dependencies (Wasserman and Faust, 1994). Social network analysis (SNA) measures relations (ties) between pairs of actors (*dyad*) and uses data on dyads to map the structure of relations in a whole network (Butts, 2009). Ties linking actors are channels through which information, ideas, knowledge, or resources, can be exchanged (Borgatti et al., 2009). In social sciences SNA commonly measures ties such as: interactions (who talks to, has sex with); social relations (kinship, subordinate, friendship); or similarities (co-membership, or shared attribute) (Borgatti et al., 2009). SNA describes various network properties including: *degree centrality* (identifying prominent actors in the network), *betweenness centrality* (describing those who forge links between others), and *density* (quantifying the degree of cohesion amongst actors in a network) (Borgatti et al., 2009). It can also quantify the extent to which actors share ties only with similar others (*homophily*) (McPherson et al., 2001).

SNA is commonly applied to measure the degree of collaboration between different health organisations (inter-organisational networks) (Provan et al., 2002). SNA studies on intra-organisational networks often measure task-related (discussing work tasks) and advice-seeking communication among actors within the same organisation (Katz and Lazer, 2003). For example, Patterson et al. (2013) use the density of task-related communication networks of health care professional groups as a measure of the extent of mutual support amongst them. There is a dearth of SNA studies on intra-organisational communication in the health sectors of LMICs (Chambers et al., 2012). The few available SNA studies in LMIC health systems have used centrality to identify influential actors in decisions to introduce new vaccines in Nigeria (Wonodi et al., 2012), or to assess the impact of influential actors such as donors on the governance of district health services in Ghana (Blanchet and James, 2013). In Ethiopia, Thomas et al. (2014) use the density of referral networks between HIV and family planning services

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