# SOCIAL ISOLATION IN SUB-SAHARAN AFRICA: A CONCEPTUAL AND MEASUREMENT ASSESSEMENT

Véronique Deslauriers[1], Simona Bignami[1], Valérie Delaunay[2], John Sandberg[3]
[1] *Université de Montréal*
[2] *Institut de Recherche pour le Développement (IRD)*
[3] *George Washington University*

## 1. INTRODUCTION

Research on social networks has significantly expanded our knowledge of how social interaction contributes to health behaviors and outcomes [1, 2]. Mostly relying on egocentric network designs, these studies have yielded evidence on various mechanisms through which networks operate on health [3, 4]. Recent evidence stemming from sociocentric network – complete networks – designs have attempted to address structural components of networks. Their effect on various health outcomes and behaviors have been investigated, including family planning and contraceptive use [5, 6]. In this literature, those components (structural) stress how central positions in networks have appeared to be important in family planning and advice networks. Results stemming from different contexts suggest that central women compared to those in the network's outskirt were more likely to use contraception, and network centrality of community agents was also associated with health outcomes [7].

The social network's approach argues that individuals are not taking actions in isolation, but rather that they are embedded in a web of social relationships [8]. The influence interactions have on a set of outcomes is of main interest. Thus, this focus has left out the potential relevance of individuals' marginalized position in their networks and their potential lack of interactions. Voluntary – social withdrawal – and non-voluntary isolation might as well be of great importance when assessing the role social networks play in health-related behaviors. In addition to its well-documented effects on health, well-being and life expectancy, social isolation might be detrimental to health-related decisions and behaviors. As interpersonal interactions influence health behaviors through the life-course, in various fashions across ages, relying on a literature mostly focusing on elders for understanding social isolation might be misleading. Seniors' detrimental health outcomes and behaviors triggered by social isolation have been extensively researched. Smoking, drinking, adopting a sedentary lifestyle, increased nutritional risks, cognitive well-being decline and increased all-cause mortality have been associated with social isolation in elders [9]. As social isolation can be both a cause and a consequence of personal events, experiences, life transitions and socioeconomic characteristics, exploring isolation in other age groups might lead to a different understanding of its relations to health.

The primary goal of this research is to establish a novel framework for understanding social isolation in Africa and to expand our knowledge concerning demographic and health outcomes associated with it, particularly concerning maternal health. Because the study of the health implications of social isolation in this context is novel, the objectives of this paper are threefold. First, we will attempt to conceptualize both the structure and impact of social isolation in an African context, including the potential implications of isolation for women's health and health behaviors. Secondly, we will create an objective synthetic measure of social isolation, using detailed sociocentric data. Finally, we will develop an exploratory demographic and health profile of the

structural and individual characteristics of women who are identified as isolates and the networks they are embedded in.

## 2. BACKGROUND

Maternal death and morbidity issues continue to be of critical concern, as evidenced by health indicators' disparities between developed and developing countries, as well as wide variations across women's sociodemographic groups. Most of the maternal deaths occur in the developing world and are associated with preventable causes. Attending antenatal consultations and giving birth in a health facility have been suggested to preventing deaths and complications. As health-related decisions are not taken in isolation, paying attention to social surroundings of women might enhance further understanding of how decisions are made. Despite the relevance of enquiring these associations, aside from contraceptive use and fertility decisions, little has been done for a better comprehension of social networks' effects on maternal behaviors in the developing world [10].

Because investigating social isolation and maternal health in an African setting is novel, many ways in which these associations might affect women's well-being should be investigated. First, centrally-positioned women might avoid adopting modern maternal and reproductive health behaviors fearing entourage's gossip or reprimand. An opposite assumption might be that new behaviors such as giving births in health facilities or attending antenatal care consultations – in opposition to seeking traditional healers' help for example –might be considered as modern and thus, being encouraged. Social networks' mechanisms, such as social influence, can hinder or foster the adoption of new behaviors depending on the context its operating in. A first hypothesis regarding the association between structural components of a women's network and maternal health behaviors could be that *off-centered women – isolates – in their network are not the firsts to adopt new behaviors because they are less affected by new norms and values, transmitted and maintained through social influence and pressure*. Second, apart from social norms, material support and knowledge sharing are also relevant components networks influences health. Centrally-positioned individuals might have an advantageous position because having more network ties provide more chances of gaining new health-related knowledge or resources. The second hypothesis could be that *isolates are late in adopting modern behaviors given limited material support driven by networks members' distance or ties' strength*.

Despite its potential importance on maternal health, social isolation has rather become the focus of an emerging literature demonstrating the role of the absence of social interaction for the health and well-being of the elderly in developed countries [11]. In these studies, social isolation concerns the objective absence of relationships with other people, and it is contrasted to loneliness, which is a subjective assessment relating to individuals' perceived levels of isolation and satisfaction with existing relationships [12]. One of the underlying assumptions is that as people age, their network tends to shrink, leading to isolation. Hence, its conceptualization builds primarily on individuals' network size, instead of also addressing structural components, such as centrality. The measurement of social isolation following this definition has been, however, mainly data-driven. It has incorporated aspects such as network size, diversity, frequency of contact with network members and participation in social activities; sociodemographic characteristics such as marital status or household arrangement; it has been defined counter-factually, as the absence of social integration; or it has simply been mixed with loneliness indicators. Taking advantage of data collected in rural Senegal, this paper aims at providing new insights in addressing and measuring social isolation.

## 3. DATA AND METHODS

*Data sources*

Data used in this paper are a combination of two datasets, one being an extensive sociocentric network panel survey fielded by the Niakhar Social Networks and Health Project (NSNHP), and the other produced by a surveillance system in the same area of rural Senegal.

The NSNHP conducted a panel survey in the Fatick region of Senegal in 2014 and 2016. In this paper, we will focus on the NSNHP 2014 baseline survey, whose sample is composed of two groups of respondents. The first group (n = 902) consisted of a representative sample of the monitored population aged 16 years and over. The second group (n = 1310) coincided with one village ('Yandé city'). The response rate to this panel survey exceeded 95%. The sample will be composed of women aged 16-49 years old.

The main innovation of the NSNHP is to have fielded a full network survey that relied on 15 name generators (representing 4 domains of interactions) and multiple measures of ties strength. In addition, a major appeal of the NSNHP for the purposes of our analysis is the algorithm developed to link ego and cited alters to their reproductive and matrimonial histories through the data of Niakhar Health and Demographic Surveillance System (NHDSS), which has been collecting data on demographic events and health behaviors and outcomes on a regular basis since 1962 [13].

*Methods*

We will begin by measuring isolation through different measures of node level centrality, capturing the degree of connectedness to others within sub-networks. Since the NSNHP is sociocentric in design, the social isolation measure will expand beyond family, or friends' only interactions.

Then, data from the NSHDSS will be used to describe and compare the fertility profiles of women of reproductive age according to their level of isolation. Of main interest are women's maternal health attributes, reproductive history, and a set of demographic characteristics among which feature age, marital status, ethnicity, and occupation. Also, since the structure of networks' women are embedded in are important to understand too, looking at kin and non-kin alters in the village might be of great importance.


## FUNDING

Fonds de Recherche du Québec - Société et Culture, NSNHP funding


## REFERENCES


1. Valente, T.W., *Social networks and health: Models, methods, and applications*. Vol. 1. 2010, New York: Oxford University Press.
2. Berkman, L.F. and I. Kawachi, *Social Network Epidemiology*, in *Social Epidemiology*. 2014, Oxford University Press: New York. p. 234–289.
3. Sandberg, J., *Infant Mortality, Social Networks, and Subsequent Fertility.* American Sociological Review, 2006. **71**(2): p. 288-309.
4. Keim, S., A. Klärner, and L. Bernardi, *Who is relevant? Exploring fertility relevant social networks*, in *MPIDR WORKING PAPER WP 2009-001*. 2009.

5. Alvergne, A., et al., *Social Transmission and the Spread of Modern Contraception in Rural Ethiopia.* PLoS ONE, 2011. **7**(6): p. e22515.
6. Stoebenau, K. and T.W. Valente, *Using network analysis to understand community-based programs: a case study from highland Madagascar.* International Family Planning Perspectives, 2003. **29**(4): p. 167-173.
7. Perkins, J.M., S.V. Subramanian, and N.A. Christakis, *Social networks and health: A systematic review of sociocentric network studies in low- and middle-income countries.* Social Science & Medicine, 2015. **125**: p. 60-78.
8. Granovetter, M., *Economic Action and Social Structure: The Problem of Embeddedness.* American Journal of Sociology, 1985. **91**(3).
9. Nicholson, N.R., *A review of social isolation: an important but underassessed condition in older adults.* The journal of primary prevention, 2012. **33**(2-3): p. 137-152.
10. Lowe, S.M. and S. Moore, *Social networks and female reproductive choices in the developing world: a systematized review.* Reproductive health, 2014. **11**(1).
11. Holt-Lunstad, J., et al., *Loneliness and social isolation as risk factors for mortality: a meta-analytic review.* Perspectives on Psychological Science, 2015. **10**(2): p. 227-237.
12. de Jong Gierueld, J., T. van Tilburg, and P.A. Dvkstra, *Loneliness and Social Isolation*, in *The Cambridge Handbook of Personnal Relationships*, D.P.A. Vangelisti, Editor. 2006: Cambridge, UK. p. 485-500.
13. Delaunay, V., *La situation démographique dans l'Observatoire de Niakhar : 1963-2014.* 2017: IRD.