



Old boys' network in general practitioners' referral behavior?[☆]



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ABSTRACT

We analyzed the impact of social networks on general practitioners' (GPs) referral behavior based on administrative panel data from 2,684,273 referrals to specialists made between 1998 and 2007. For the definition of social networks, we used information on the doctors' place and time of study and their hospital work history. We found that GPs referred more patients to specialists within their personal networks and that patients referred within a social network had fewer follow-up consultations and less inpatient days thereafter. The effects on patient outcomes (e.g. waiting periods, days in hospital) of referrals within personal networks and affinity-based networks differed. Specifically, whereas empirical evidence showed a concentration on high-quality specialists for referrals within the personal network, suggesting that referrals within personal networks overcome information asymmetry with respect to specialists' abilities, the empirical evidence for affinity-based networks was different and less clear. Same-gender networks tended to refer patients to low-quality specialists.

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1. Introduction

In most health-care systems, general practitioners (GPs) serve as gatekeepers who coordinate access to health-care services provided by resident medical specialists, outpatient departments, and hospitals. Though institutional settings differ between countries and health-care systems, primary care providers can either diagnose and treat patients themselves or refer the patients to medical specialists. Patient referrals from GPs to specialist care (resident doctors or hospitals) are of particular importance in health policy. (i) Quantitative evidence has shown that follow-up health-care

costs vary substantially depending on GPs' referral behavior.¹ (ii) A quality-cost tradeoff for patients' health may exist depending on whether they are being referred on to further specialists or receive treatment from the GP. (iii) Finally, the introduction of managed care in national health systems has changed the responsibility and flexibility of GPs in their referring behavior by limiting the number of consultants (e.g., resident specialists, hospital doctors) to whom patients are allowed to be referred, and by shifting control over health-care delivery from doctors' judgment toward predetermined bureaucratic mechanisms such as referral guidelines. Regardless of whether referral rates are high or low, the policy-relevant question is whether referrals are medically and economically appropriate or not. Obviously, from a medical point of view, the referral behavior of GPs should be based on medical criteria. Apart from that, economic considerations influence the referral behavior of GPs due to scarcity of resources in health-care systems.

Under the traditional view of microeconomics, interactions between economic agents take place via markets and their signals (Manski, 2000; Soetevent, 2006). However, in a regulated health-care sector where costs for medical services are covered by social insurance, the price mechanism does not function as it otherwise would. This is particularly true in Bismarckian fee-for-service (FFS)

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¹ For example, Crombie and Fleming (1988) found that a 10-fold difference in hospital expenditures for GP practice populations is associated with the lowest and highest rates of referrals to hospitals.

health-care systems. As a result, we propose that social interaction plays an important role in doctors' referral behavior.

In this paper, we analyzed the referral behavior of GPs who refer patients to resident specialists for further diagnosis and treatment. Based on comprehensive administrative panel data from the Austrian province of Upper Austria for the period of 1998–2007, we studied the quantitative relationship between doctors' referral behavior and their affiliation with a social network. A GP and a specialist form a social network if they (i) studied at the same university, (ii) studied at the same university at the same time, (iii) worked in the same teaching hospital, (iv) worked in the same teaching hospital at the same time, (v) were in the same age cohort, or (vi) were the same sex. The influence of the GP's social network on his/her referral behavior might be detrimental in the case of "old boys networks," in which referral decisions are mainly driven by doctors' rent-seeking motives. This would be the case if referral decisions do not reflect medical necessities but rather preferential treatment of befriended specialists, who increase their income by additional health care services provided for patients referred within the social network. Social networks could also be of benefit for patients if GPs take inside information into account when they select a specialist, using all the relevant information that he or she has gained from past referrals, such as the ability of a specialist, his or her strengths, and wait times, to increase the quality of the referral.

First, we identified the determinants of GPs' referral rates and analyzed the role played by social networks. Second, by observing patient flow between all pairs of GPs and medical specialists, we examined (i) whether GPs preferred specialists belonging to their social network to outsiders for given referral rates, and (ii) the appropriateness of within-network referrals. The appropriateness of a referral was measured by waiting time, follow-up consultations, the referral's effect on patient health, and outpatient expenditures of the referred patient. (iii) Finally, we offer empirical strategies that allow for discrimination between two competing mechanisms that could explain network effects in doctors' referral behavior. We tested whether social networks reduce information asymmetries with respect to specialist quality (statistical discrimination) or simply reflect the selection of particular groups of patients who were referred from GPs to medical specialists.

We found that doctors' networks formed at the teaching hospital played an important role in their referral behavior. The number of referrals from a GP to a medical specialist increased, *ceteris paribus*, if both doctors had worked in the same teaching hospital, and increased further if they had worked there at the same time. Moreover, patients referred within a social network had fewer follow-up consultations with another specialist in the same medical field, and compared to patients referred outside the social network, spent fewer subsequent days in the hospital; they also lost less work time due to illness. A network referral increased the waiting time of patients slightly, though we did not find any differences in outpatient expenditures or subsequent re-referrals to specialists from other medical fields. From this, we conclude that referrals within doctors' social networks are more appropriate, as they neither adversely affect patients' health nor increase health-care costs. Further empirical evidence showed that within hospital and co-worker networks, higher-quality doctors received more referrals than lower-quality doctors compared to referrals outside of the network. We conclude that social networks help to reduce information asymmetry with respect to specialists' abilities.

1.1. Networks and referral rate

Previous studies have focused on the following determinants of referral behavior: (i) patient characteristics, (ii) GP characteristics,

(iii) practice characteristics, and (iv) the availability of specialist care. O'Donnell (2000) reported in her comprehensive literature survey that age and gender may explain approximately 10% of the variation observed in referral rates. Similarly, Salam-Schaatz et al. (1994) showed that controlling for patient characteristics decreased the variation in primary care doctors' referral profiles by more than 50%. The empirical evidence on the most important GP characteristics, namely, age and years of experience, is inconclusive. Whereas several UK studies did not identify any significant impact of age or experience on a GP's referral rate (Cummins et al., 1981; Wilkin and Smith, 1987), one Finnish study (Vehvilainen et al., 1996) and another UK study (Rashid and Jagger, 1990) reported higher referral rates for younger and relatively inexperienced primary care providers. Conflicting evidence was reported on the impact of practice characteristics. Whereas several authors found a positive association between high referral rates and single-handed practices (Hippisley-Cox et al., 1997a), others reported no relationship between referral rates and the number of doctors in a practice (Christensen et al., 1989). Conversely, Verhaak (1993) found an increase in referral rates with the number of GPs in the practice. Finally, a series of empirical studies stressed the importance of the availability of specialist care in explaining referral rates (Jones, 1987; Noone et al., 1989; Roland and Morris, 1988). Madeley et al. (1990) found that urban GP's have higher referral rates than do their rural counterparts.

O'Donnell (2000) concluded that patient characteristics together with practice and GP characteristics cannot explain more than 50% of the variation in referral rates. Qualitative empirical evidence suggests that "having a personal relationship with the consultant" is one of the most important determinants of referral decisions in a fee-for-service (FFS) environment (Shortell, 1973) and that GPs rely on consultants' professional reputations in their referral decision-making (Ludke, 1982). Similarly, Whyntes et al. (1998) suggested that GPs' choice of referral destination is dominated by their knowledge of and confidence in the hospital consultants and by their physical proximity. Anthony (2003) argued that, in addition to personal and professional relationships, FFS referrals rely on direct communication between the providers and on the opportunities to monitor one another in the referral process.

1.2. Networks and referral appropriateness

The main contribution of this paper is the positive and normative analysis of the impact of the doctors' membership in social networks on the GPs' referral behavior. Even if network effects can be identified, social and professional relationships in referral processes do not guarantee, *per se*, high-quality health-care. "Referral relationships based in social ties may be stuck in old-boy networks, or based on friendship or inertia, resulting in referrals to known, but not necessarily high-quality providers" (Anthony, 2003, p. 2035). Schaffer and Holloman (1985) found that GPs selected their consultants from a group of colleagues with whom they shared a background, interests, or training. However, the authors did not offer a strategy for normative statements about the patients' welfare or the health-care system. Neither the magnitude of referral rates nor their determinants allow a clear judgment on whether referrals are appropriate or not.

Coulter (1998) specifies a referral as appropriate if it is necessary for the patient, effective in achieving its objectives, timely in the course of the disease, and cost effective.² Similarly, Foot et al. (2010)

² An extended welfare economic perspective might focus on the net benefits of referrals; this would, however, require the economic (monetary) evaluation of health benefits.

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