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Accessibility of tertiary hospitals in Finland: A comparison of administrative and normative catchment areas

Tiina Huotari [a, *], Harri Antikainen [a], Timo Keistinen [b], Jarmo Rusanen [a]

[a] Geography Research Unit, University of Oulu, PO Box 3000, FI-90014, Finland
[b] Ministry of Social Affairs and Health, PO Box 33, FI-00023, Finland

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ABSTRACT

The determination of an appropriate catchment area for a hospital providing highly specialized (i.e. tertiary) health care is typically a trade-off between ensuring adequate client volumes and maintaining reasonable accessibility for all potential clients. This may pose considerable challenges, especially in sparsely inhabited regions. In Finland, tertiary health care is concentrated in five university hospitals, which provide services in their dedicated catchment areas. This study utilizes Geographic Information Systems (GIS), together with grid-based population data and travel-time estimates, to assess the spatial accessibility of these hospitals. The current geographical configuration of the hospitals is compared to a normative assignment, with and without capacity constraints. The aim is to define optimal catchment areas for tertiary hospitals so that their spatial accessibility is as equal as possible. The results indicate that relatively modest improvements can be achieved in accessibility by using normative assignment to determine catchment areas.

1. Introduction

One of the principles of Finnish health care policy, which is also in Finland's constitution, is the right of every resident to receive adequate health services regardless of ability to pay, or place of residence. Accordingly, the majority of hospitals in Finland are public, owned by municipalities or joint municipal authorities. The spatial organization of health care is a trade-off between providing efficient and equal health care to the population. This is especially difficult in Finland, with its small, but geographically dispersed population. In Finland, the current geography of health care dates back to decisions made soon after World War II. Mainland Finland (excluding the autonomous Åland Islands, off the southwest coast of Finland) was divided into 20 hospital districts, each with a central hospital (Fig. 1). A hospital district is responsible for providing hospital services and coordinating specialized public hospital care within its area (Saarivirta et al., 2010; Teperi et al., 2009).

The hospital districts in Finland are grouped into five tertiary care regions organized around the five university teaching hospitals located in Helsinki, Turku, Tampere, Kuopio and Oulu (Fig. 1). The main function of these regions, or university central hospital regions, is to centralize care delivery for highly specialized, complex or rare conditions, surgeries and other forms of treatment (Act on Specialized Medical Care (1062/1989), 2010; Teperi et al., 2009). Such services typically require a large catchment area to ensure sufficient client volume. This is necessary to maintain the provision of high-quality services, in terms of both economic efficiency and the expertise needed to provide highly specialized care. Ultimately, this may contribute to improved client safety, which has been suggested in many studies (e.g. Finks et al., 2011).

The five tertiary care regions in Finland are often colloquially referred to as “million districts,” suggesting that each should serve its equal share of about five million inhabitants. In reality, however, this has never been the case, as illustrated in Fig. 2. Over the entire period since the inception of the tertiary care regions in the 1970s, the tertiary hospitals in Helsinki and Tampere have together served at least 50% of the entire population, leaving the other three tertiary hospitals with considerably lower shares of the population. The population in the catchment area of the Helsinki tertiary hospital has been constantly increasing, accentuating the differences between catchment areas.

A significant proportion of the Finnish population has always

* Corresponding author.
E-mail addresses: tiina.huotari@oulu.fi (T. Huotari), harri.antikainen@oulu.fi (H. Antikainen), timo.keistinen@stm.fi (T. Keistinen), jarmo.rusanen@oulu.fi (J. Rusanen).

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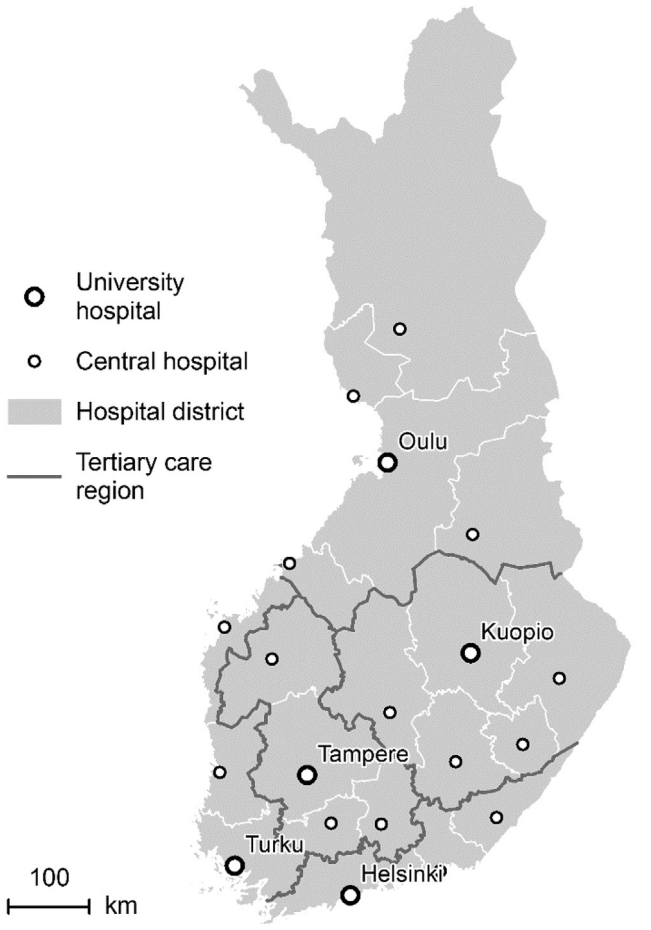

Fig. 1. Tertiary care regions and the central hospital districts in Finland, excluding the autonomous Åland Islands.

been concentrated in the coastal regions in the South and West. To date, settlement of the eastern and northern parts of the country has been encouraged many times in an effort to achieve more balanced regional development (Westerholm, 2002). Despite these efforts, in recent decades, the population has increasingly retracted toward the South of Finland, which has been accompanied by considerable urbanization (Tervo, 2005). This development challenges the existing spatial divisions of health care based on districts defined in the 1940s and a hospital network that was mainly constructed during the 1950s and 1960s. The increasingly uneven population distribution may lead to increased demand for services in certain areas, whereas in others, the population base may no longer be sufficient either to maintain specialized health service delivery or to ensure its high quality.

It is worth scrutinizing the tertiary regions' suitability to serve the population's health care needs. Currently, an initiative is underway to reform health care provisions along with the administrative regions. The reform entails fundamental changes to responsibilities for health care provision. The current tertiary regions have been suggested as prime candidates for the new geographical regions for health care provision. Health care services and administration could be aggregated into these new regions to ensure quality, equal access to health care services and cost reductions. In addition, according to the latest Health Care Act (1326/2010), a person should have the right and freedom to choose where to go for treatment. Assuming that hospitals have similar service levels – as they ought to – it is reasonable to expect that choices will be influenced by distance.

1.1. Access to health care

The large catchment areas necessary to guarantee adequate client volumes for tertiary hospitals inevitably raise the question of how tertiary care can be accessed, which mainly implies distance. The question of whether a service is within a reasonable distance from potential patients is common in health care, and distance has been shown to affect utilization of health care and health outcomes across many settings (Tanser et al., 2010). The question regarding distance and its effect on equity arises particularly in situations where a network of public services is reduced or its allocation is adjusted. However, in cases where more service facilities are established, the debate may concern the issue of who has the greatest need for better access to services. Despite strong views on the topic, it is possible that the actual implications of service-network changes are poorly understood and, arguably, sometimes overestimated. This makes it important to properly understand what really constitutes access to health care, and how it can be assessed.

This study concentrates on spatial accessibility, which is one of the dimensions of the more extensive term “access.” Following the definition by Penchansky and Thomas (1981), access to health care is an umbrella term that encompasses a set of characteristics

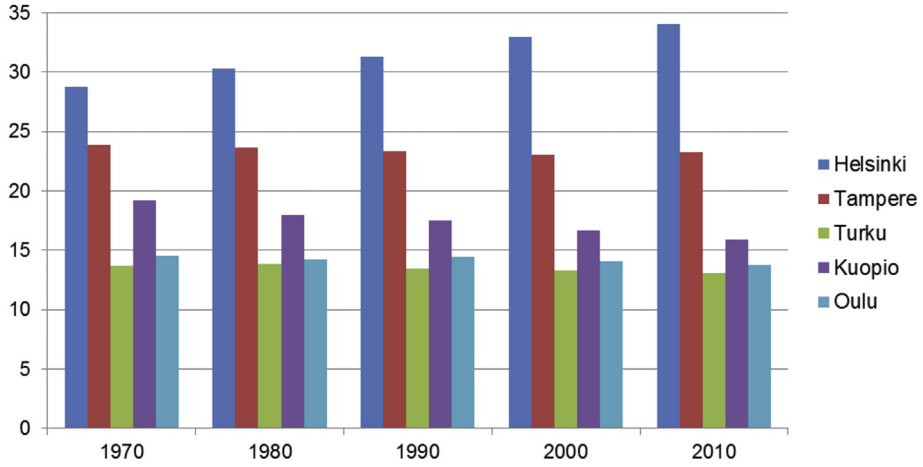

Fig. 2. The percentage of population in the tertiary care regions in five selected years between 1970 and 2010.