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ORIGINAL ARTICLE

Identifying the Spatial Distribution of Dental Outreach Program in London, Ontario

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ABSTRACT

The impact of oral health on total health and personal well-being has been well documented. Unfortunately, many individuals suffer from the effects of poor oral health and cannot seek dental care due to financial limitations. The Dental Outreach Community Service (DOCS) program at the Schulich School of Medicine & Dentistry at Western University, functions to provide free dentistry to those individuals within an educational context. This report looks at the spatial distribution of family income and the spatial representation of the DOCS program in London, Ontario, between 2008 and 2015. A DOCS spatial distribution map has been generated to illustrate the association.

Keywords: Dental, Education, Income, Outreach, Spatial.

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INTRODUCTION

The importance of proper oral health care cannot be overstated.[1,2] The delivery of treatment to combat infection, alleviate pain, and restore function and esthetics remains paramount.[3] In addition, the prevention of disease of the hard and soft tissues remains imperative.[4] However, there is a large portion of the population, particularly in Ontario, that does not have access to these fundamental necessities.[5]

The link of oral health to total health has been well documented in the literature.[1-3] Poor dental health has been identified as a contributing factor to numerous systemic diseases, including respiratory disorders,[6] nutritional problems,[3,7,8] diabetes,[3,9] cardiovascular diseases, preterm low birth weight babies,[6,9,10] rheumatoid arthritis,[11] and osteoporosis.[5] The proper maintenance of good oral health extends far beyond the oral cavity. In fact, some medical procedures, such as organ transplants, require the individual to have a dental examination to rule out any sources of dental infection that may affect the success of the surgery.[12]

Oral diseases can result in a number of personal problems, such as social well-being and self-esteem.[5] Oral health has also been identified as an influencing factor of life expectancy.[5] Consequently, proper oral health plays a critical synergistic role in the quality of life. Despite it being an important contributing issue to overall health and well-being, a larger number of economically challenged individuals are unable to access emergency dental treatment or routine dental care. It is reported that over 40% of Ontario residents do not have routine dental care.[13] Tooth decay plagues 57% of children, 59% of adolescents, and 96% of adults.[5] The disparity in oral health is more pronounced for individuals with low income and those who are not eligible for any category of dental benefits.

The Dental Outreach Community Service (DOCS) program aims to help alleviate some of these disparities. The DOCS program is a mandatory component to the 4th year and International Trained Dentists program at the Schulich School of Medicine & Dentistry at Western University. Patients are screened and accepted into the program by each of the community agencies, emphasizing a truly collaborative approach. Typically, patients have no dental insurance and no financial means for treatment, including any government subsidiary programs. Patients are initially seen in their community, in a location that they are comfortable in. Phase 1 of the program operates by traveling to community agencies within London, and providing introductions, examinations, radiographs, diagnoses, and treatment planning. The goal for the offsite aspect was to alleviate as many barriers to treatment that individuals may have. Once diagnoses and treatment has been planned, phase 2 is the delivery of treatment rendered at the Dental School. The location change allows the students to provide treatment in an environment that they are comfortable in without a compromise in quality for the patients. Treatment includes examinations, radiology, diagnoses, extractions, endodontics, periodontal therapy, restorative procedures, and limited removable prosthodontics. Complex cases are referred to the hospital (general practice residency program) and a local oral surgery clinic

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(Interface), emphasizing the multidisciplinary aspect of the program. Additionally, some community dentists provide treatment for exceptionally special cases.

This report presents the economic distribution and the spatial representation of the DOCS program in London, Ontario, between 2008 and 2015.

MATERIALS AND METHODS

Each community agency recorded the total number of new patients to the DOCS program per year. These values were summed for the term that the agency remained in the DOCS program. Values were recorded in Table 1. A family income data (FID) map (2011) was acquired[14] based on information from Statistics Canada. The FID map was used as a base for an overlay map composition. A second data proportion (DP) map was then generated. Agencies were represented by their geographical location. A circle was created in which the diameter was representative of the total number (sum) of new patients. The larger the circle, the more the total number of new patients. An overlay was created with the DP over the FID map. Map size and position were adjusted accordingly to maximize accuracy. A third map, DOCS spatial distribution (DSD) map (Fig. 1), was then generated with the cumulative information. This map denotes the spatial representation of the DOCS program in relation to economic distribution.

Table 1: Number of patient visits (2011-2012) to each community agency in the DOCS program

Location	*2008-2009*	*2009-2010*	*2010-2011*	*2011-2012*	*2012-2013*	*2013-2014*	*2014-2015*
Boys/Girls club	50	43	39	39	44	48	56
Crouch library	0	0	19	34	29	20	21
Glen cairn	60	47	41	27	19	36	28
Limberlost chaplaincy	44	32	43	32	26	31	11
NE resource center	0	0	42	28	37	33	26
Salvation army	0	0	0	0	0	0	21
South London NR center	0	0	0	0	43	45	45
Southdale chaplaincy	0	62	32	45	50	29	15

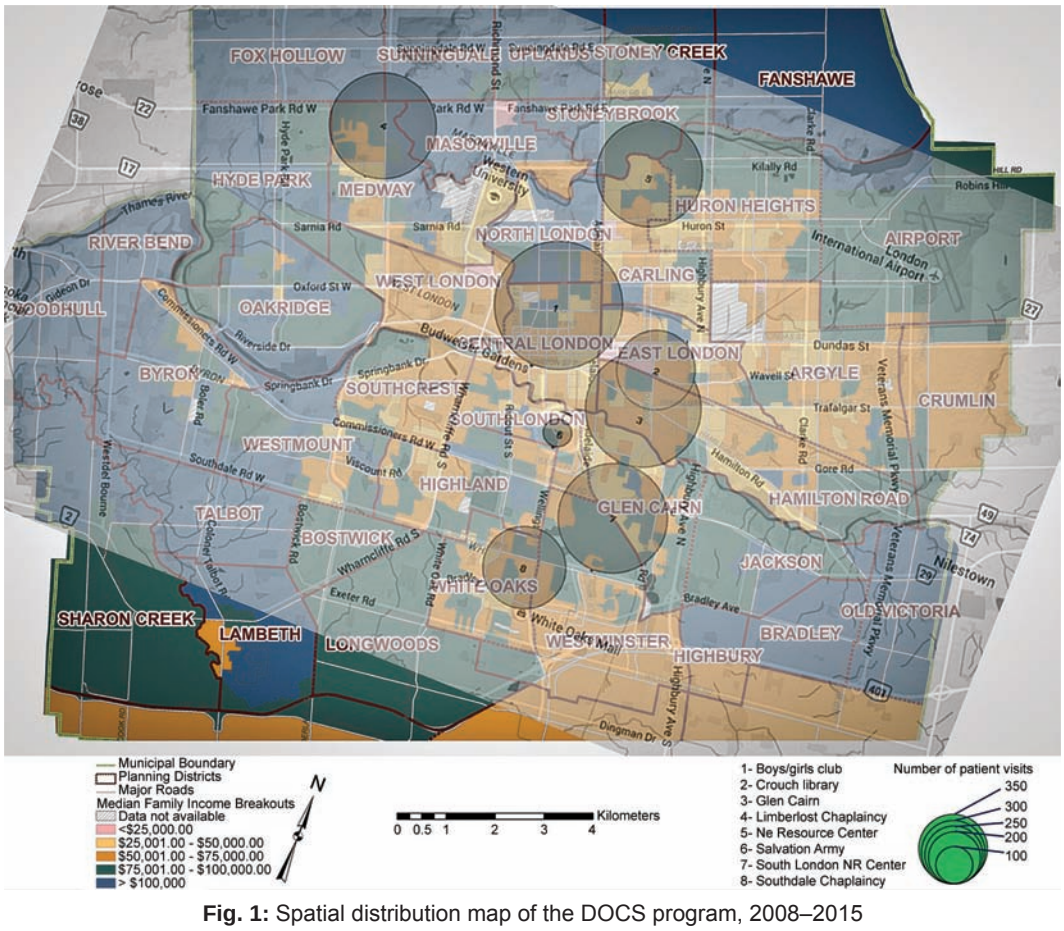

Fig. 1: Spatial distribution map of the DOCS program, 2008–2015

RESULTS

The family household income map represents yearly median family income based on color (pink: <$25K, light yellow: $25,001–$50K, dark yellow: $50,001–$75K, green: $75,001–$100K, blue: >$100K). Two areas of pink exist in the core and in the north. In the core, DOCS has three agencies that serve the area. DOCS had an agency in the north, but the agency has removed itself from the program. This area requires an agency partnership to address the economic category. There are several areas of light yellow and yellow that do not have an agency partnership to address the economic category. Of particular interest is the entire north/northeast section that would benefit from representation. There are several green areas and subsequently several agency collaborations within close proximity to serve the areas. The majority of blue areas are to the north and west, with a small pocket in the core. Agency 4, now discontinued, was in close proximity to a significant blue area. Similarly, Agency 1 has close proximity to a very small blue area, which is nested within yellow areas. From a spatial distribution aspect, relocating Agency 3 to one in a more easterly location would serve the economic situation more appropriately (Fig. 1).

DISCUSSION

The DSD map illustrates that the DOCS program has spatial representation that seems to coincide with the lower economic distribution of London. Adjusting locations to those closer to lower economic categories would seem ideal to maximize the spatial representation. The total number of new patients seen is still dramatically low, based on the perceived need. Although a formal needs assessment has not been performed, the amount of patients directed to DOCS and waitlisted is significant. In addition, hospitals, private dentists, and other agency programs continually enquire about how to triage patients into DOCS. The DOCS program does not have the capacity to admit every qualified individual. Growth of the DOCS program would allow a more substantial impact on the needs of the local community and lessen the burden on hospitals and physicians. Further detailed research is required to assess the needs assessment and propose changes to the program.

As the DOCS program is an integral part of the dental curriculum, expansion of the program would require increased financial and administrative support. Expansion would require support by senior leadership and proper allocation of administrative and faculty resources. The DOCS is currently run by individuals with a small portion of their time devoted to the program. Expansion would require individuals to have the proper time to not only support and manage, but also to elevate the program.

In Canada, adults and seniors make up a significant portion of the at-risk population for low-to-no access to dental care.[15,16] Consequently, DOCS focuses on lessening that disparity for those members of the London community. This disparity highlights a significant public health problem and reinforces a critical issue: What levels of society are responsible for providing essential oral health care to its members? It should be recognized as a shared responsibility among relevant stakeholders. The DOCS program is dedicated to this initiative and provides a framework for the delivery of oral health care. However, it is unable to fully meet the needs of the population without the necessary resources from the university, municipal, provincial, and federal levels.

There are several other outreach programs at dental schools in Canada. There is much variability on the delivery of treatment, operating model, funding, and support. Further interdisciplinary research is required to assess the programs and determine key variables for successful growth and sustainability.

As the population grows and economic difficulties intensify, there will be a marked increase in the disparities in oral health. Outreach programs will act as a primary approach to help alleviate the issue and provide individuals with an avenue for treatment of dental diseases. The support, by institutions and government programs for outreach, will remain a crucial issue for the improvement of the overall quality of life for Canadians.

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