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Article

Towards an understanding of the structural determinants of oral health inequalities: A comparative analysis between Canada and the United States

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ABSTRACT

Objective: To compare the magnitude of, and contributors to, income-related inequalities in oral health outcomes within and between Canada and the United States over time.**Methods:** The concentration index was used to estimate income-related inequalities in three oral health outcomes from the Nutrition Canada National Survey 1970–1972, Canadian Health Measures Survey 2007–2009, Health and Nutrition Examination Survey I 1971–1974, and National Health and Nutrition Examination Survey 2007–2008. Concentration indices were decomposed to determine the contribution of demographic and socioeconomic factors to oral health inequalities.**Results:** Our estimates show that over time in both countries, inequalities in decayed teeth and edentulism were concentrated among the poor and inequalities in filled teeth were concentrated among the rich. Over time, inequalities in decayed teeth increased and decreased for measures of filled teeth and edentulism in both countries. Inequalities were higher in the United States compared to Canada for filled and decayed teeth outcomes. Socioeconomic characteristics (education, income) contributed greater to inequalities than demographic characteristics (age, sex). As well, income contributed more to inequalities in recent surveys in both Canada and the United States.**Conclusions:** Inequalities in oral health have persisted over the past 35 years in Canada and the United States, and are associated with age, sex, education, and income and have varied over time.© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Inequalities in oral health are ubiquitous with their persistence recognised over time in both developing and developed countries (Sheiham, Conway, & Chestnutt, 2015). Income gradients in oral disease, for example, where disease increases with diminishing income, are not only detrimental for individuals but have significant implications for the population (Sheiham et al., 2015). In such cases, differences in oral health outcomes are often attributed to individual-level demographic and socioeconomic characteristics (Sisson, 2007). However, as individuals are embedded within social, economic, and political contexts, such structural factors cannot be ignored and must be understood in order to fully address inequalities as they may enable or prevent healthy lifestyle choices (Rose,

1985). These structural determinants of health outcomes and inequalities have been described as the degree of income inequality, labour market characteristics, insurance coverage of health care, public/private service delivery mix, accessibility of services, and the extent of inter-sectorial policies (Mackenbach, 2003). Importantly, where analyses of structural factors have been performed in the health and dental literature, comparative analyses of health outcomes in countries with different health care, social, and economic systems, enables an understanding of how societal factors may contribute to such inequalities (Guarnizo-Herreno, Tsakos, Sheiham, & Watt, 2013; Siddiqi, Kawachi, Keating, & Hertzman, 2013; Bhandari, Newton, & Bernabe, 2015).

With similarities and differences in social, economic, and political contexts in Canada and the United States, it has been suggested that comparing these two countries holds important insights for understanding how structural determinants, such as social policies and economic resources, shape inequalities (Prus, 2011; Siddiqi & Hertzman, 2007). Cross-country comparative analyses have previously been

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performed using the Joint Canada–United States Survey of Health [JCUSH]; findings from these studies identify how societal differences have contributed to inequalities in self-rated health among individuals of different sociodemographic and socioeconomic characteristics (Siddiqi et al., 2013a, 2013b; Prus, 2011). Longitudinal analyses of health outcomes between Canada and the United States have also revealed how changes in societal factors, such as the degree of income inequality, equality in the provision of social goods, and extent of social cohesiveness have influenced health inequalities (Siddiqi et al., 2013a, 2013b).

In terms of oral health inequalities specifically, cross-country comparisons have been primarily performed across European countries (Bhandari et al., 2015; Guarnizo-Herreno et al., 2013a, 2013b; Bernabe & Sheiham, 2014; Guarnizo-Herreno, Watt, Pikhart, Sheiham, & Tsakos, 2014; Listl, 2015; Manski et al., 2015; Guarnizo-Herreno et al., 2013a, 2013b). Indeed, to date, only one study has examined inequalities in oral health between Canada and the United States. Elani and colleagues (2012) compared the prevalence of oral health and disease within and between Canada and the United States by income, place of birth, and education. They found greater narrowing of absolute differences among place of birth, education, and income in Canada in comparison to the United States (Elani, Harper, Allison, Bedos, & Kaufman, 2012). However, by relying on simple measures to quantify and compare differences in outcomes among income groups and between countries, their findings only scratched the surface towards understanding contributors to income-related oral health inequalities. Our aim was to provide breadth and depth of understanding to the nature of oral health inequalities by identifying how structural- and individual-determinants may influence oral health inequalities through a comparative analysis within and between Canada and the United States.

2. Structural determinants of oral health within Canada and the United States

We hypothesised that structural determinants, such as the characteristics of oral health care systems, as well as social and economic conditions shape individual-level determinants and population-level oral health inequality. Table 1 provides a comparative framework outlining changes to oral health care systems, as well as social and economic conditions in Canada and the United States from the 1970s to 2000s.

2.1. Major sources of financing dental care

In both Canada and the United States, the major sources of financing dental care in the 1970s were predominantly through out-of-pocket payments, followed by private insurance payments (Health Canada, 2010; U.S. Department of Health and Human Services, 2000). It was not until the 1980s that private insurance started to compete with out-of-pocket payments to be the major source of dental care spending, which has continued to the 2000s (U.S. Department of Health and Human Services, 2000; Quiñonez, Grootendorst, Sherret, Azarpazhooh, & Locker, 2007). Despite this shift, trends in public financing of dental care have differed between Canada and the United States, with a decline in public spending on dental care experienced in Canada (20% to 5.3%) between 1970 and 2008 and an increase in the United States (5.4% to 7.3%) over the same time period (Canadian Institute for Health Information, 2012; Centers for Medicare and Medicaid Services, 2013). As of 2009, the public share of dental care expenditures is greater in the United States (9.5%) than Canada (5.4%) (Ramraj, Weitzner, Figueiredo, & Quiñonez, 2014).

Table 1
Comparative framework to analyse oral health inequalities.

	Canada		United States	
	1970s	2000s	1970s	2000s
Oral health system characteristics				
Major source of financing dental care		Out of pocket (OOP) and private insurance		
Dental insurance coverage	^a	62% privately insured 6% publicly insured 32% un-insured	^a	60% privately insured 5% publicly insured 35% un-insured
Dental networks & reimbursement systems	Open Fee-for-service	Open Fee-for-service	Open Fee-for-service	Open and Managed Care Mix of fee-for-service and capitation
Service delivery environment	Private practice	Predominately private practice with some non-traditional practice	Private practice	Predominately private practice with some non-traditional practice
Social and economic contexts				
Income distribution ^{b,c}	Gini (G): 0.304 P90/P10: 4.1 (1976)	G: 0.321 P90/P10: 4.1 (2008)	G: 0.316 P90/P10: 4.8 (1974)	G: 0.378 P90/P10: 5.9 (2008)
Employment Status ^d	Full-time Unemployment rate (UR): 6.9% (1975)	Non-standard UR: 6.1% (2008)	Full-time UR: 8.5% (1975)	Non-standard UR: 5.8% (2008)
Education (Percentage High school completion of population > 25)	37.7 (1976) ^e	84.6 (2006) ^f	64.1 (1976) ^g	85.5 (2006) ^g

^a Information not available.

^b OECD.Stats. 2015. Income distribution database. Retrieved from: <http://www.oecd.org/std>.

^c Gini coefficient of disposable income post (taxes and transfers); P90/P10 disposable income decile ratio

^d OECD.Stats. 2015. Unemployment rate aged 15 and over, all persons. Short-term Labour market Statistics. Retrieved from <http://www.oecd.org/std>.

^e Statistics Canada. 1976. Population: demographic characteristics. Level of schooling by age groups. 1976 Census of Canada. Catalogue 92-827. Bulletin 2.8, Table 30.

^f Statistics Canada. 2006. Population: demographic characteristics. Level of schooling by age groups. 2006 Census of Canada. Catalogue no. 97-564-XCB2006009.

^g US Census Bureau. 1974-2002. March Current Population Survey 2003–2014. Annual Social and Economic Supplement to the Current population survey. <http://www.census.gov/hhes/socdemo/education/data/cps/index.html>.

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