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Review

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Measuring Health Services Utilization in Ethnic Populations: Ethnicity and Choice of Frameworks

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ABSTRACT

Background: Health services utilization (HSU) is an important health outcome indicator, a surrogate measure of access to healthcare, that influences the outcomes of health status and consumer satisfaction, is a surrogate measure of access to healthcare. To most healthcare providers, understanding patterns of HSU is important for health system resource planning and allocation. In studies of HSU, the ethnicity variable is key especially in multicultural societies such as Canada where a significant proportion of the population consists of visible minorities, who, often are referred to in research studies as 'underserved' or as 'hard-to-reach' in the sampling context.

Approach: This article discusses the relevance and utility of some frameworks for studying access to healthcare. It is intended to set the stage for a future study comprehensive systematic literature review of models of access to care and models of health system performance that address access as a criterion. To achieve this, I present selected published research on frameworks for access to medical care and HSU, including their characteristics and appropriateness for health services research. Subsequently, I briefly examine two studies that explore HSU, in Canada and the United States to determine the extent to which the selected framework or its components were employed. Finally, I describe ethnicity as a variable in the framework for HSU and conclude with limitations of this review.

Conclusions: This paper has highlighted the approaches to health services utilization and the application of the Aday-Andersen framework for studies on access to care. Although this paper draws on relevant and some important contributions in the field, the assessment presented here is not exhaustive and warrants a more comprehensive review that includes recent literature on the subject.

KEY WORDS: Methods; Health services; Access; Ethnicity; Frameworks.

ABBREVIATIONS: HSU: Health Service Utilization; CCHS: Canadian Community Health Survey; CHA: Canada Health Act.

INTRODUCTION

The Canada Health Act (CHA)[1] promises to facilitate reasonable access to health services without financial or other barriers. The use of health services is defined as the process of seeking professional healthcare and submitting oneself to the application of regular health services, with the purpose to prevent or treat health problems. Although, the decision to use health services is an individual choice, the choices are mostly framed in the social context through cultural, social and family ties; especially for ethnic minorities.[2] Health policy makers have an important role to ensure equal access to the healthcare system, with the ultimate outcome of improving the health condition of individuals, including hard-to-reach populations. Thus access may mean that services are available whenever and wherever the patient needs them and that the point of entry to the system is well defined.[3]

Unfortunately, there is no straightforward measure to operationalize this concept of access to care. Health services utilization (HSU), is an important health outcome indicator that influences the outcomes of health status and consumer satisfaction, is a benchmark of health policy regarding "access", and is a surrogate measure of access.[4] Understanding patterns of HSU is important for planning purposes and for appropriate allocation of scarce resources in the community. This is of particular importance to ethnic populations; who in the service context are sometimes referred to as 'underserved'[5] or as 'hard-to-reach' in the sampling context.[6] While a study of healthcare services utilization is important, it is worth noting, within a broader public health context that a consensus holds that among all the major determinants of a population's health, access to and use of healthcare services contributes between 10-20%. Certainly, this is context-dependent but the relative importance of social determinants of health (e.g., income and social status, gender, education and literacy, social environment, personal health practices and coping skills, physical environment) and genetic factors should be more clearly acknowledged.

APPROACH

This article is a review of HSU frameworks to inform a survey of hard-to-reach populations in a Canadian province. It is intended to set the stage for a comprehensive systematic literature review of models of access to care and models of health system performance that address access as a criterion. To achieve this, I used selected published research to examine frameworks for access to medical care and HSU. I then describe their characteristics and appropriateness for health services research, and discuss the rationale for choosing a particular framework. Subsequently I briefly examine two studies that explore HSU in Canada and the United States to determine the extent to which the selected framework or its components were employed. Finally, I describe ethnicity as a variable in the framework for HSU and conclude with a summary response and limitations of this review.

DISCUSSION

Assessment of Frameworks for HSU

Given the intermittent link between health service use and access, studies of HSU are often framed using the concept of access to healthcare. There are multiple theories or frameworks of how access is structured. The empirical research that has been driven by these frameworks often suffer from a lack of consensus on what constitutes access. Two of the leading frameworks of access are those proposed by Aday and Andersen,[7] and Penchansky and Thomas.[8]

Penchansky's and Thomas's[8] framework for understanding access focused on the interaction of key elements that determine use of services. Fundamental to this framework is a suggestion of the concept of "fit" between the patient's needs and the system's ability to meet those needs; and that this fit could be measured across five dimensions[8]: (1) *availability* – the volume of physician and other healthcare services; (2) *accessibility* – which means the spatial or geographic relationship between the providers of healthcare and the users of care; (3) *accommodation* – meaning the organization and content of the healthcare system as it relates to the ease with which people can use care (clinic hours, waiting time, and length of waiting time for an appointment); (4) *affordability* – the financial ability of the population to use the care provided by the system and perception of value on the part of patients; (5) *acceptability* – meaning the attitudes of the users of healthcare toward the providers, and *vice verse*. An inherent weakness of Penchansky's and Thomas's framework was the suggestion that 'fit' is a process of adjustment between the population and the healthcare delivery system; and the lack of a clear definition of terms (access, accessibility, availability) which are being used interchangeably.[9]

To improve the understanding of the concept of accessibility, Frenk[9] proposed new definitions, referring to access – as the ability of a person to utilize healthcare given a need and/or desire to obtain it, while accessibility is the degree to which a person needing and seeking care actually receives care. Despite these alternative definitions, measures of 'ability to utilize' 'need and/or desire to obtain' care remain unclear. This limitation makes the Penchansky and Thomas framework less adapted for studies of HSU. However, the "fit" concept has been used in empirical studies for the development of indices for under service.[10] This constitutes a strength as it might serve for designating and allocating resources to medically underserved areas rather than to describe health services use by hard-to-reach populations.

One of the most often cited frameworks for HSU in the population is what was originally called the "Behavioral Model of Health Services Use" developed by Andersen[11] and subsequently published with Aday as a "Framework for the Study of Access to Medical Care."[7] In developing the framework, Aday and Andersen took note of two key issues: 1) that earlier frameworks of use of healthcare focused on 2 major alternative dimensions - the characteristics of the population *versus* the characteristics of the delivery system; 2) it was the use of service and outcomes of the use process that could be used to measure access. With this in mind, they postulated that achieving change in health behavior (use of health services) depends on three primary determinants of health behavior including: 1) the characteristics of the health delivery system, 2) the population, and 3) the external environment.

The *characteristics of the health delivery system* are represented by resource factors (e.g. the invested labor and capital) and organizational factors (including both entry to the system such as waiting time and travel time, and passage through the system such as treatment received and who the patient sees). The *characteristic of the population* comprise predictors of healthcare utilization (i.e demand for services), and are categorized into classes of predisposing features (P), enabling features (E), and aspects of need (N); thus the reference 'Aday-Andersen P-E-N model' is often used in the literature.[12] Predisposing features include socio-demographic variables, such as age and gender; social structural factors, such ethnicity, socioeconomic position and education; and certain beliefs about health. Enabling resources exist at the level of the community, such as the availability of health facilities (e.g., physician supply in the community), and at the level of the individual, such as the means and know-how to get to health facilities and the ability to pay for healthcare (income, health insurance). Need factors refer to the biologic imperative of disease, as evaluated by the professional (i.e., evaluated health), and the pain or symptom as experienced by the individual (e.g., perceived health).[12] The *external environmental factors* reflect the economic climate, relative wealth, politics, level of stress and violence, and the prevailing norms of society.[7,13,14]

Key to the Aday and Andersen framework[7] is its clarity on measures of HSU. The utilization of health services (intermediate outcome indicators) may be characterized in terms of its type, site, purpose, and the time interval involved.[12] Type may include services such as, hospital, physician, dentist, emergency care, home care; the site at which care was rendered (home, office, clinic, inpatient hospital, etc.), the purpose of the care received (preventive, curative, stabilizing, custodial), and the time interval involved (percent of population at risk who did and did not see a physician in a given time interval, mean number of visits to a physician in a given time interval), and continuity as measured by number of different providers contacted for a given episode of illness. Donabedian[15] argues that measures of time interval for a visit should distinguish "initiation" and "continuation", as they measure who gets into the system and how often they use it, respectively. This concept makes cross-sectional studies limiting for assessing HSU since they are carried out at one point in time.

Aday-Andersen Framework *Versus* Epidemiology

Compared to traditional medical epidemiology (primary focus on risk factors and behaviors), the Aday-Andersen framework[7] includes social determinants of health and illness, and has translated the concept of "access" into a complex, multidimensional health policy measure. As a health policy measure, Andersen referred to "equitable access", as occurring when demographic and need variables account for most of the variance in utilization[11]; and "Inequitable access" when social structure (e.g., ethnicity), health beliefs, and enabling resources (e.g., income) determine who gets medical care".[14] In the context of Canada, The CHA[1], hopefully should ensure equitable access through its promise to facilitate reasonable access to health services without financial or other barriers.

Given the broad social context that the framework encompasses, it is particularly relevant to investigating issues regarding access among hard-to-reach (ethnic) populations, for whom, variation in health services utilization (e.g., hospital and cancer screening services) has been documented in Canada.[16] Despite its wide spread use in health services research, the Aday-Andersen framework[7] is merely a theoretical framework for analyzing the factors rather than providing a mathematical model with precise variables or providing precise methods to be used. The choice of factors depends on the extent of prior research, the research question, the purpose of the study, and data availability.[13]

Assessing need for Health Services

Two approaches have been used to assess need for services in a population; the community based approach (survey) and the record based approach (registers, data linkage).[12] The community based approach is advantageous over the record based approach because in addition to estimating demand for services, it assesses need for those services in a population.[12] In this light, most empirical studies use data generated from surveys to make inferences on the populations' use of health services. The Aday-Andersen framework has been used more often to guide research and evaluation studies on access and HSU than other approaches. In a special issue of *Health Services Research*, published in 1998 (www.pubmedcentral.nih.gov/tocrender), 139 papers used this framework between 1975 and 1995. That issue reviewed the development of the concept and its relationship to policy initiatives, and how access measures are operationalized in commonly used survey data. An assessment of that review is out of scope in this context.

Here I examine examples of empirical research that have indirectly applied the Aday-Andersen framework[7] to investigate HSU in Canada and the United States. They include studies conducted by Quan et al[16] using data from the 2001 Canadian Community Health Survey (CCHS), administered by Statistics Canada[17]; and another by Lasser et al[18], involving data from Joint Canada/US Survey of Health,[19] administered between November 2002 and March 2003 by Statistics Canada and the US National Center for Health Statistics. The first study assessed the use of health services by white and visible-minority populations in Canada. The second assessed health status, disease prevalence, behavioral risk factors, healthcare utilization, and access in both Canada and the United States. Characteristics of both studies included use of multi-stage complex sampling procedures, a cross-sectional survey, one time random telephone survey (land line only) of none institutionalized adults (very low income populations, who may be less likely to own telephones, may be under sampled). None of the authors made mention of a framework in the introduction and design sections (Quan et al[16] cited Aday-Andersen under interpretation). This omission of framework is probably justified given the secondary nature of the data. Nevertheless, but for environment, the results of both studies highlight some of the important population and health behavior characteristics (Table 1) included in the Aday-Andersen framework. For convenience of interpretation, I group measures of HSU into indicators measures, such as physician and hospital use, preventive health services; and corresponding outcome measures including physician visits, mammograms. The indicators can be used as a set of measures of access which can allow populations to be compared (e.g., ethnic *versus* white as in Quan et al[16]), or may allow comparisons between countries (as in Lasser et al[18]). However, health policy decisions

Table 1: Indicators of Health Services Utilization in Population-Based Surveys.

Study	Use of health services		Population characteristics	
	Physician/Hospital	Preventive	Predisposing factors	Need factors
Quan et al[16] (Canada)	Visits/phone contact Hospital admissions	Pap smear Mammogram PSA	Age, sex, ethnicity, marital status, education, income, years in Canada, Language ability	Chronic conditions Health status
Lasser et al[18] (Canada&USA)	Physician contact Dentist year	Pap smear mammogram	Age, sex, race, foreign born, education, income, marital status	Chronic conditions Health Status

are usually country specific and the latter comparison maybe less useful in this context. The outcome measures used in both studies were particularly important in assessing HSU by type, site, and purpose.

While it is safe to say the analysis of HSU in both studies used cross-sectional surveys, the analysis tend to relate to discrete events where a person is in need of services, seeks them out and receives some form of care, advice, or therapy, and the outcome is measured. This is the premise of the Aday-Andersen framework.[7] The findings from these studies demonstrated the dimensions of health services research and the potential influence on health policy decisions. For example, Quan et al[16] found that use of health services varies considerably by ethnicity according to type of service; meanwhile Lasser et al[18] showed that United States residents are less able to access care than are Canadians, and that universal coverage appears to reduce most disparities in access to care. This latter finding is useful at the macro level (e.g., the institutionalization of universal coverage at the national level in the case of Canada). Studies of HSU by hard-to-reach (ethnic) populations will require the application of the Aday-Andersen framework[7] at the micro-level. This explains why factors other than environment, are often overlooked.

Ethnicity and Aday-Andersen Framework

Given that this paper focuses on identifying an appropriate framework to examine HSU in hard-to-reach (ethnic) populations, it is imperative to highlight specific aspects of ethnicity for consideration when applying the Aday-Andersen framework[7] to studies of HSU among ethnic populations. Ethnicity is derived from a Greek word meaning a people or tribe.[21] The concept of ethnicity is neither simple nor precise, but it implies one or more of the following: shared origins or social background; shared culture and traditions that are distinctive, maintained between generations, and lead to a sense of identity and group; and a common language or religious tradition.[20] The social variables that make up ethnicity may be important in determining differences in health status.[22] For example, the appearance of a highly consistent pattern of differential mortality between races may be ascribed to environmental (that is, social), not genetic factors.[22] Ethnicity covers two heterogeneous underlying factors, societal factors and cultural/ethnic factors. Societal factors refer to factors that are external to the individual and cultural/ethnic factors refer to individual-level behavior.[22,23] Scheppers et al[24] have reviewed potential barriers to the use of health services among ethnic minorities. According to the review, factors relating to ethnicity which are used to explain disparities in health and healthcare use include patient, healthcare systems, and provider level variables.[24]

The process by which persons seek help is complicated, and there are typically large differences between populations with the same physical problems. Snowden and Yamada[25] highlighted numerous cultural differences in access to care. Kleinman[26] proposed that illness-related beliefs formed culturally influenced explanatory models, and that help-seeking tendencies logically followed. Mechanic[27] lists a range of determinants that affect the response to bodily deviations, and Leaf et al[28] explain that each of these determinants may differ widely among subgroups of the population and strongly affects the use of services. Armenian and Shapiro[12(p.97)] conclude that "the challenge for the health services researcher conducting a community survey is to include sufficient detail on these processes to develop a compelling explanatory model for predicting services use".

CONCLUSION

Numerous frameworks have been employed in studies of health services utilization. In this paper, I examine in greater detail, the Aday-Andersen framework and conclude that it is widely used and therefore most appropriate for use in studies to investigate health services utilization among hard-to-reach populations. This is due primarily to the following reasons:

Firstly, the fact that it goes beyond earlier frameworks that described population and individual characteristics, to suggest that it is the use of service and outcomes of the use process that could be used to measure access. Secondly, there is clarity in measures of health service utilization. Thirdly, compared to traditional epidemiology, the framework includes social determinants of health and illness, and has translated the concept of access into a health policy measure defining equitable access, as occurring when demographic and need variables account for most of the variance in utilization; and inequitable access, when social structure, health beliefs, and enabling resources determine who gets medical care.

Finally, the process by which persons seek help is complicated, and there are typically large differences between populations with the same physical problems. These differences can be cultural; may be related to differing help-seeking tendencies; may differ widely among subgroups of the population; and strongly affects the use of services. The Aday-Andersen framework is merely a theoretical framework for analyzing the factors that influence health services utilization. Despite its use in empirical studies, it does not provide a mathematical model with precise variables or providing precise methods to be used. The choice of factors depends on the extent of prior research, the research question, the purpose of the study, and data availability. Thus, the health services researcher may consider including sufficient detail on processes affecting use of health services, to be able to develop a compelling model for predicting services use.

This paper has highlighted the approaches to health services research and the application of the Aday-Andersen framework for studies of health services utilization among hard-to-reach (ethnic) populations. The assessment presented here is not exhaustive but adds to the discourse on approaches for assessing population health, particularly hard-to-reach populations who, often are likely to be excluded from health research studies due to difficulties with sampling. Moreover, although this paper draws on relevant and some important contributions in the field, it did not incorporate most recent work. This constitutes a major delimitation but provides the rationale for a more comprehensive review in a future study.

CONFLICTS OF INTEREST

The author declares that there is no conflicts of interest

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