The availability of demographic and socioeconomic determinants of health care utilization

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Abstract

The European White Paper "Together for Health" states that reducing health inequalities is an important goal for European health strategies. At first sight, all European countries have universal insurance coverage, implying that there is universal and equal access to health care services. Several studies have shown, however, that this is not the case. Also, although there has been some research on the subject, information on differential health care utilization is incomplete. By taking a look at Andersen's conceptual framework on the access of health care services and literature on the subject, we composed a list of individual demographic and socioeconomic determinants of health care utilization that should be available in several databases if one's aim is researching the subject.

The aim of this paper is to evaluate whether European data sources make analyses on individual demographic and socioeconomic determinants of health care service utilization possible with the data that is provided. The Health for All Database does not seem to focus on utilization measures and the necessary demographic and socioeconomic indicators, making ecological correlational studies difficult. Eurostat provides more opportunities for this. The European Social Survey does allow some analysis on the subject. However, health care utilization measures are rather limited. The European Health Information Survey includes all of the necessary determinants, as well as measures of health care utilization. Comparability of data resulting from this survey might, however, be restricted.

Keywords: demographic and socioeconomic determinants, health care utilization, health for all database.

Introduction

Attention to the analysis of the determinants of medical health care utilization has grown over the last decades, resulting from a number of related values and perceptions, such as: (i) growing consensus that all people have a right to medical care, regardless of their ability to pay for it (1); (ii) a general belief that certain population groups are not receiving medical care which is comparable to the care available to the rest of the population (2). Also, the European White Paper "Together for Health" mentions reducing health inequalities as an important goal for European health strategies (3). At first sight, all European countries have universal insurance coverage and all citizens should thus enjoy universal and equitable access to health care services (4). However, a number of studies indicate that this is not the case (5-9). Although some have documented these inequalities, this information remains incomplete. The aim of this paper is to evaluate the availability of individual socioeconomic and demographic determinants of health care utilization for such studies in selected European data sources, based on a conceptual framework developed by Andersen, Aday and other colleagues.

A framework for studies on the utilization of medical health care services

According to Andersen & Newman (10) the utilization of health services can be viewed as a type of individual behavior. Behavioral sciences have attempted to explain individual behavior as a function of individual characteristics, characteristics of the environment in which an individual lives, and interaction of individual and societal forces (11). A behavioral framework that takes into account both individual and societal determinants has been developed by Andersen (12), and has frequently been adapted, reprobated and altered (13-16) (Appendix). In this paper, we use the model dating from 1995 (17), with adaptations made by the American Sociological Association (ASA). The model is mainly one describing factors that influence access to medical care. Utilization may be

considered an objective indicator of realized access to services (15). Access refers to the people in need of medical health care actually receiving that care. We will not elaborate any further on environmental indicators and personal health choices, as they are not the focus of this paper. The interested reader can consult Appendix A and the reference list for more information on this model.

In this framework, characteristics of the population are individual determinants of health care utilization, subdivided in predisposing, enabling and need characteristics (10,15). Predisposing characteristics refer to the propensity of an individual to use health care services. They exist prior to the onset of illness (e.g., age, sex, religion, health beliefs and education). Enabling characteristics are the means of an individual to use services, they can be an individuals'/families' financial attributes (e.g., income, insurance coverage) or organizational attributes of the community (e.g., rural/urban community). An individual's need is the most immediate determinant for health care utilization, and refers to the illness level.

Research on demographic and socioeconomic determinants of health care utilization

According to Andersen (12), predisposing, enabling and need factors would have differential ability to explain use, depending on the type of service that is being examined. Hospital service utilization should then primarily be explained by need and demographic characteristics, while dental services considered as more discretionary would be more likely explained by social structure, beliefs and enabling factors. Research confirms this. We, however, only focus on demographics and socioeconomic characteristics in this paper.

Several studies demonstrate increases in utilization rates and variability of ambulatory services as age increases. Variations were observed by gender, as overall women were more likely to consult a family physician, and men more likely to visit specialists and the emergency room (19-21). According to these studies, the gender gap found may also in part be explained by low social class status. In a

study based on American data from the early 1990s among the older age groups (21), there were also considerable differences in utilization according to ethnicity, even after controls for predisposing factors and measures of need. Also, an Italian study on utilization by immigrants shows they are less likely to use specialist and telephone consultations, yet their probability of using emergency rooms is higher than the natives' (22). Marital status is also linked to health care service utilization: the divorced have the highest hospital admission rates and the never married have the lowest rates of utilization of every type (18,23). Numerous studies report socio-economic status (SES) based disparities: high users of specialist services were more likely to have higher SES, lower SES tends to be linked to a more intensive use of GP's (9,18,20,23-27).

Methods

Data on empirical indicators of the populations' access/utilization of medical care make it possible to measure differentials in the utilization of services and compare for different subgroups of a population. Through such measures, health care policy makers could make better informed decisions about the progress of the health care system towards achieving equity of access (13). Based on a systematic literature review of articles on Andersen's framework and studies on individual determinants of health care utilization, we compiled a list of socioeconomic, demographic and health care service utilization indicators that we believe should be available in European data sources if one's aim is a European study on health care utilization at the individual level (Table 1).

Table 1. List of necessary indicators for research on the links between individual demographic/socioeconomic determinants and health care service utilization

Predisposing demographic	Predisposing socioeconomic	Enabling socioeconomic	Health care service utilization
Age	Education	Income	Type of service
Sex/Gender	Occupation	Insurance coverage	Contact with provider within given time interval?
Race/Ethnicity			Volume of contacts within a
Marital status			time interval
Migration			

Based on that list we evaluate the aptitude of the following European data sources for such a study by checking the indicators they include:

•   *The Health for All Database (HFA-DB)* is an initiative by the World Health Organization (WHO) Regional Office for Europe on data collection. It provides a selection of core health statistics on the 53 countries in the WHO European region (28). It allows queries for country, intercountry and regional analyses. The data in this database are compiled from various sources, including a network of country experts, WHO/Europe's technical programmes and patner organizations, such as agencies of the United Nations system, the statistical office of the European Union (Eurostat) and the Organization for Economic Cooperation and Development.

•   *Eurostat* is the official statistical office for the European Union. Its goal is providing the European Union with statistics that enable comparisons between countries and regions, by developing a common "statistical language" (29). Data are provided by the member states' statistical agencies.

•   *The European Social Survey (ESS)* (fifth round, 2010) is a multi-country survey, covering 28 countries (30). It aims to monitor and interpret changing public attitudes and values within Europe and to investigate how they interact with Europe's changing institutions, to advance and consolidate improved methods of cross-national survey measurement in Europe, and to develop a series of European social indicators.

•   *The European Health Interview Survey*

(EHIS) aims to measure the health status, life style (health determinants) and health care services use by EU citizens on a harmonized basis with a high degree of comparability among member states (31). The survey questions are fit into ECHI (European Community Health Indicators) or OMC (Open Method of Coordination) indicators to ensure comparability.

Results

Table 2 presents the results of the database-exploration. As noted in the previous section, HFA-DB and Eurostat only contain data on country or regional level. We indicate the availability of a relevant indicator in both databases with an "A" (aggregated).

• HFA-DB does not contain specific information on age: only percentages of the population aged 0-14 or +65 are available (28). Gender-indicators are limited to the mid-year female or male population. Education is indicated as the percentage of the population +25 years old with primary education only, secondary education only, or post-secondary education. The occupational indicators in this database are confined to (un)employment rates. Although some aggregated health expenditure indicators are included in the database, one cannot obtain data on insurance coverage or income. Outpatient contacts per person per year is the only aggregated utilization indicator available. It is defined as the number of contacts/ consultations with a physician per person in a given year, but does not specify the type of physician.

• Eurostat provides population tables by age-group, sex, marital status and educational level (based on ISCED 1997) (32). Although the database offers subdivision of marital status in more categories than simply "single", "married", "divorced" or "widowed", data on these four categories of marital status is never available for France, Malta, Poland, Austria, Azerbaijan, Slovakia and Turkey. Tables by highest educational level (ISCED 1997) are available for most countries, yet data on some very specific educational categories is not (e.g., pre-primary level). Since 2008, it is possible to view data on the country of birth (either foreign, reporting country or EU27), which is available for the majority of countries. One has to take into account, however, differences in who is included in national datasets. Data on health care utilization is retrieved and aggregated from results of the European Health Information Survey (EHIS), such as "consultation of a medical professional in the last 4 weeks" (number of times) and "use of medicines during the past 2 weeks" (subdivided in types of medicine).

• The ESS includes most of the relevant demographic and socioeconomic indicators (33). Ethnicity is limited to answers to "Do you belong to an ethnic minority group in your country of residence?". The categorical income-variable refers to the household's total income from all sources, after tax and compulsory deductions. No utilization indicators were available in the ESS round 5. However, round 2 (2004) does include a variable indicating the number of times a doctor/specialist/GP was consulted in the past 12 months.

• A European-level survey which includes all of the indicators on our list and more is EHIS (34). However, whether the institutionalized population was included differed between countries. Also, not all EU-countries have participated in using the EHIS yet, nor is the survey or the resulting data set necessarily comparable for the ones who did due to possible differences in weighting procedures, rounding, wrong use of algorithms, programming errors, problems in the definition of the indicators, etc. (35).

Table 2. Availability of individual determinants in selected databases

Indicator	HFA-DB	EUROSTAT	ESS	EHIS
Demographic:				
Age	-	A	+	+
Sex/Gender	A	A	+	+
Race/Ethnicity	-	-	(+)	+
Migrant	-	A	+	+
Marital Status	-	A	+	+
Socioeconomic:				
Education	A	A	+	+
Occupation	(A)	A	+	+
Income	-	-	+	+
Insurance coverage	-	-	-	+
Utilization:				
Type				
GP	-	-	-	+
Specialist	-	-	-	+
Dental care	-	-	-	+
Hospitalization	-	-	-	+
Medication	-	A	-	+
Contact	-	-	-	+
Volume	A	A	(+)	+

Discussion

In conclusion we found that it is likely that EHIS is the most appropriate European data source for a study on demographic and socioeconomic determinants of health care utilization. Although cross-national comparability of data based on this questionnaire is uncertain (35), it is the only data source that includes such an elaborate list of variables on health care utilization and individual determinants of utilization. The ESS is not fit for studies focusing on health care (utilization). The goal of this survey is different, as it is stated that values and attitudes of citizens are what data is primarily collected on (30). Although individual indicators were the focus of this paper, we included HFA-DB and Eurostat to evaluate whether they have aggregated data on the selected demographics and socioeconomic indicators. If so, ecological correlational studies could be carried out to get a glimpse of how important a determinant is on a country level, the ecological fallacy kept in mind (36). HFA-DB seems rather limited for this purpose. Based on Eurostat indicators, however,

one can look at some relationships at an ecological level. Nevertheless, the database does not distinguish different types of service utilization.

We have explored the data sources mentioned above in order to check whether data from European data sources make research on the individual demographic and socioeconomic determinants of health care utilization possible. Nonetheless, there are some limitations to this paper. First of all, we have used a conceptual framework by American authors. One could argue whether such a framework is compatible with European studies and thus data collection. Some of the studies on European countries included in our literature review, however, use Andersen's framework as a starting point (21,22,37). Nevertheless, two indicators are not routinely collected in European data sources: insurance coverage and ethnicity. The first because all European countries are expected to have universal coverage (4), the latter because it is a sensitive topic in some European countries (38,39).

Second, if a relationship is observed based on the

indicators mentioned above, the direction will not always be clear and controls for some confounders should probably be added. Yet, the availability of the necessary confounding variables may be a topic for another paper as such. Also, if a researchers' goal is to fully understand why some subgroups use certain health care services more or less, qualitative research could provide useful information. Another problem yet to be overcome is a lack of contextual variables in data sets that also include individual-level utilization data. An answer to this could be the merging of databases that include details patient-level utilization data with databases that include environmental and system charac-teristics (17). Personal identifiers are required for

such linkages, yet difficult to obtain because of confidentiality. Also, data to be linked may be from different time periods or have incompatible file structures. The construction of an ESS Multilevel Database has been a step in the right direction in this respect, yet, as mentioned above, does not focus specifically on health care utilization (40). Finally, some other data sources may be worth looking in to if the goal is to close the gap in information on demographic and socioeconomic indicators and health care utilization measures. Only by assuring high quality data on the subject will it be possible to do research on it, which can be used for policies aimed at reducing inequalities in health care utilization.

Conflicts of interest: None declared.

Appendix. The behavioral model: chronological overview

The initial model (Figure 1) suggests that people's use of health services is a function of their predisposition to use services, factors which enable or impede use, and their need for care (11). Originally the behavioral model focused on family as the unit of analysis, because the medical care an individual receives is most certainly a function

of the demographic social and economic charac-teristics of the family as a unit. However, Andersen shifted to the individual as the unit of analysis because of the difficulty of developing measures at the family level that take into account the potential heterogeneity of family members (e.g., summary measures of "family health status") (15).

Figure 1. The initial behavioral model (1960s) *[Source: (15)]*
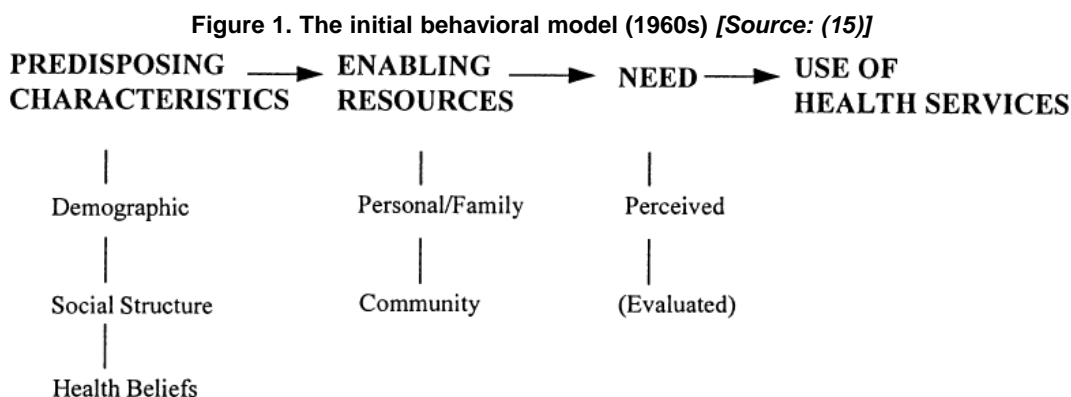
The model of the 1970s (Figure 2) was developed by Aday and other collaborators (15). The health care system was explicitly included in this phase, recognizing the importance of national health policy and the

resources and organization in the health care system as important determinants of the population's use of services, as well as changes in those use patterns over time. In a third phase (Figure 3), measures of access

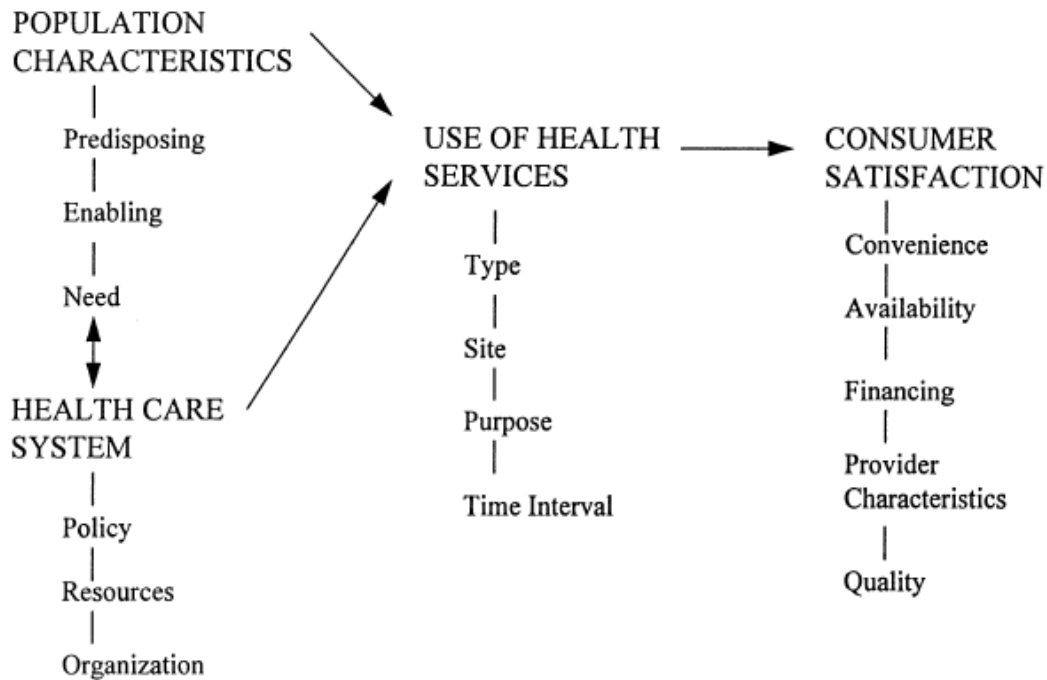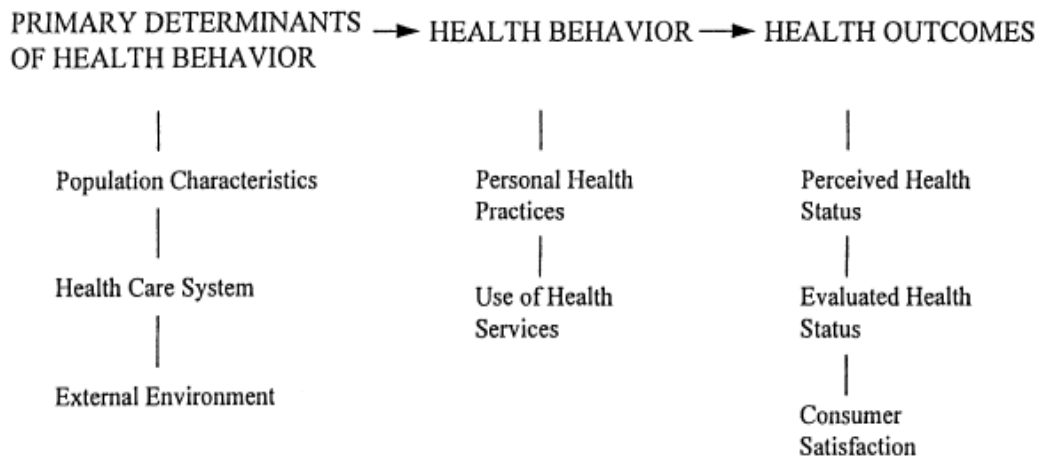**Figure 2. Phase 2 (1970s)** *[Source: (15)]*

POPULATION
CHARACTERISTICS
|
Predisposing
|
Enabling
|
Need

HEALTH CARE
SYSTEM
|
Policy
|
Resources
|
Organization

USE OF HEALTH
SERVICES
|
Type
|
Site
|
Purpose
|
Time Interval

CONSUMER
SATISFACTION
|
Convenience
|
Availability
|
Financing
|
Provider
Characteristics
|
Quality

Figure 3. Phase 3 (1980s-1990s) *[Source: (15)]*

PRIMARY DETERMINANTS ➔ HEALTH BEHAVIOR ➔ HEALTH OUTCOMES
OF HEALTH BEHAVIOR

Population Characteristics

Health Care System

External Environment

Personal Health
Practices

Use of Health
Services

Perceived Health
Status

Evaluated Health
Status

Consumer
Satisfaction

were extended to unclude dimensions which are particularly important for health policy and health care reforms (15).

A fourth and emerging model (Figure 4) emphasizes the dynamic and recorsive nature of a health services' use model, which includes health status outcomes. It portrays the multiple influences on health services' use and, subsequently, on health status. Feedback loops are included, showing that outcome in turn affects subsequent predisposing factors and perceived need for for services as well as health behavior (15).

Figure 4. Phase 4: emerging model *[Source: (15)]*
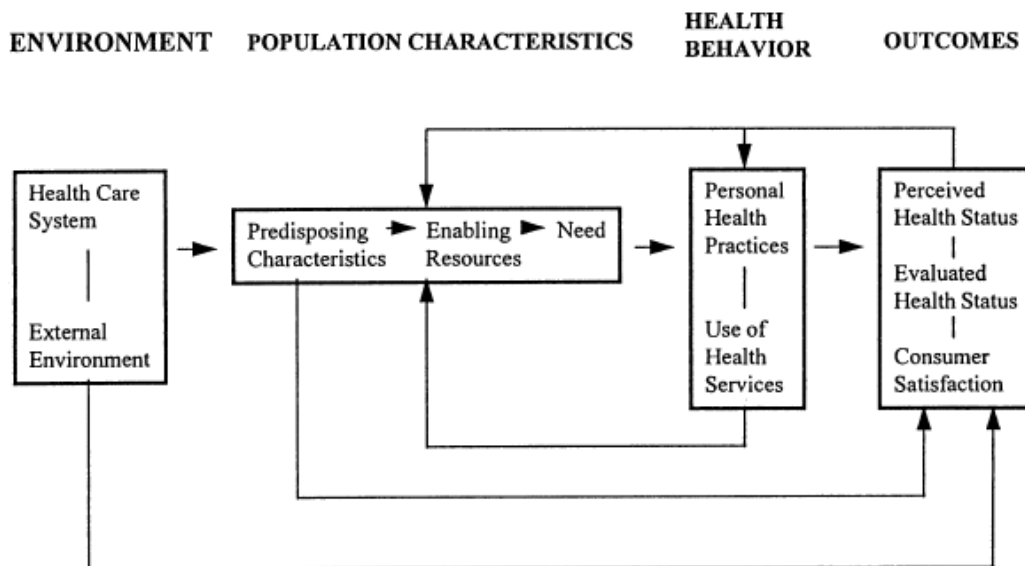
In 1995, the American Sociological Association added provider-related dimension to the framework. This includes patient factors that may be influenced by providers which enable patients to obtain services (e.g., out-of-pocket price of services, whether one has a regular source of care), and provider characteristics that interact with patient characteristics to influence utilization (e.g., gender of the physician).

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