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Original Research

Decomposition of inequity determinants of healthcare utilization, Iran

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ABSTRACT

Objective: To investigate and decompose the determinants of healthcare utilization in a central province in Iran.
Study setting: Data from 2711 individuals were gathered through interview in a cross-sectional study in Markazi province, Iran, as part of the Healthcare Utilization Survey in 2008.
Methods: The household economic index (HEI) was created using principal component analysis, and data were analyzed according to the type of healthcare utilization. In addition, the generalized estimation equation model was used to identify the determinants, and the concentration index was calculated and decomposed based on the healthcare utilization determinants.
Results: HEI was a fixed determinant for all three types of healthcare utilization (general physician, specialist and health worker); however, other determinants changed with the type of health care. The greatest contributors to inequity in the use of general physician, specialist and health worker care were HEI quintile (41.4%), housewife/retired (32.8%) and living in an urban area (47%), respectively. The concentration index was highest for specialist care and lowest for health worker care.
Conclusion: The pattern of utilization differed between the types of health care. Nevertheless, inequity in healthcare utilization is related to government health policies, including the role of the system in reducing inequity by application of policies such as the family physician and rural insurance programme; and factors which are beyond the health system authorities, and are related to population living standards and need intersectoral cooperation.

Introduction

Given the improvement in health facilities and indicators worldwide, health inequity is one of the most pertinent and relevant issues for health policy and public health.[1] There is general agreement that many of these inequities are unfair due to social and economic differences between different groups of people.[2] Studies have shown that health inequity is

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related to various socio-economic as well as demographic factors; for example, people with the lowest socio-economic status experience more health problems, such as higher infant mortality and lower healthcare utilization.[1–5] Recent studies have shown that healthcare utilization is related to socio-economic status, area of residence, severity of disease, gender, and people's health beliefs.[1,6,7] However, from the point of view of policy makers, there is a need for quantification of healthcare utilization determinants in order to indicate the types of policy and the direction of the resources that are needed to reduce inequity indexes.[2]

The public sector of the health system in Iran has three levels: primary, secondary and tertiary care.[8] Primary care is responsible for delivering primary healthcare services, is located in rural areas, and covers people living in remote areas and the urban poor. Secondary care is speciality treatment services that deliver care to urban areas, and tertiary care is super-speciality treatment services for the mega cities.[9] However, the referral system plays a major role in referring people to higher levels of care.[8] The private sector also plays an important role in emergency, treatment, diagnostic and pharmaceutical services in private hospitals, and other places such as drug stores and laboratories.[8,9]

The Family Physician Project was established in Iran in 2005 to increase accessibility and utilization of health care in order to decrease the disparities in rural areas and among the urban poor. Based on this project, the healthcare insurance organization in Iran prepares the insurance for all people in rural and urban areas (>20,000 people)[10,11] It provides an opportunity for general physicians (GPs) to practice as regular primary care workers.[12]

However, in spite of all the improvements in the health indicators in Iran,[13] and given that Markazi province is a central province in Iran where accessibility to health care is high, this area experienced high inequity in infant mortality.[14] Also, there is evidence of inequity in healthcare utilization,[15] but the extent to which each type of health care [GP, specialist and primary health worker (HW)] affects inequity is not known. Therefore, this study was conducted to identify the most important determinants of the types of healthcare utilization, and to decompose the inequity determinants in order to quantify their contribution to healthcare utilization inequity as a guide for health policy makers.

Methods

This cross-sectional study was based on the national Healthcare Utilization Survey in Markazi province, one of the central provinces in Iran, which was conducted over a 2-week period in 2008 (16 February–1 March). Sampling units were 758 households that were selected through systematic sampling based on the sampling schedule of the Iranian household framework that exists in the Health Promotion and Network Development Centre of the Ministry of Health and Medical Education (MHME).[16] After interviewing the households selected for the study, data were gathered from 2711 individuals using a pre-coded and pre-tested questionnaire.[16] This questionnaire had been used previously in the 2002 Healthcare Utilization Survey in Iran,[17] and the method has been described elsewhere.[15] Subjects aged <15 years were excluded from the study; therefore, 2131 individuals were included in the analysis. The outcome variable in this study was use of outpatient healthcare services (GP, specialist and HW) in the 2 weeks preceding the interview. The research protocol was approved by the Ethics Committee of MHME, and each participant gave their informed consent.

Determinants of inequity

Principal component analysis (PCA) was used to create the household economic index (HEI); this is a valid method for the creation of socio-economic status in developing countries.[18,19] Ownership of 25 asset variables was used for PCA; these included separate kitchen, bathroom, toilet, fully healthy toilet, using the kitchen stove, safe heating and cooling devices, having living facilities [such as freezer, refrigerator, television (black and white, colour or LCD), mobile telephone, washing machine and dishwasher, microwave, vacuum cleaner], computer, Internet access at home, motorcycle, car, own villa and own house. The first component of PCA explained 21.6% of the total variance and was used as the economic status of the households. After sorting the scores for the first component of PCA, HEI was created. The data were analyzed according to the type of healthcare service utilized. In addition, the participants who had sought health care were categorized into three groups based on the type of health care they had accessed: GP care, specialist care, or HW care as well as family physician care. As family physicians provide free or inexpensive care and work as regular primary care providers,[12] the latter category was defined as 'HW care'. The inequity determinants for the three groups were determined separately. Each group was compared with subjects who needed outpatient care but did not seek it. Robust estimator of logit link function in the generalized estimation equation model with the exchangeable correlation matrix was used in order to adjust the standard error of estimates for the cluster effect of household correlated data,[20] and also to compute odds ratios (OR) and 95% confidence intervals (CI). Statistical analysis was conducted using STATA Version 9.0, and $P < 0.05$ was taken to indicate statistical significance.

Decomposition analysis

It is proposed that the linear regression model must be applied to the regression determinants in order to identify the regression coefficients in decomposition analysis.[21] The regression equation is:

$$y_i = \alpha + \sum \beta_k x_{ki} + \varepsilon_i \quad (1)$$

where y is the health variable, x_{ki} is the health determinant, and ε is the disturbance term. However, in the present study, the outcome variable was a binary variable (i.e. use of care or no use of care), and logistic regression is more appropriate for binary outcomes. Also, as the concentration index (C) calculation is related to regression coefficients of the determinants obtained from the regression model, the GEE regression model was used to adjust the correlated effect of the subjects in each cluster.[20] Therefore, in the first formula, y is the Ln odds of the