Primary Health Care and the Management of the Ambulatory Care Sensitive Conditions of
Hypertension and Diabetes in Jamaica

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Abstract

Background: There are a range of chronic, acute and vaccine preventable ambulatory care sensitive conditions (ACSC) in the overburdened public health system in Jamaica. This study examines the performance of the primary health care (PHC) system for managing chronic non-communicable diseases by studying hypertension and diabetes.

Method: The study used a stratified random sample of 285 hypertensive and diabetic hospitalization cases from 2008 to 2009 in SERHA. Region wide hospitalization cases were reviewed to assess rates of ACSC; economic burden of ACSC was estimated using cost of illness approach and logistic regression analysis was done to estimate likelihood of ACSC in SERHA.

Results: Hospitalization was higher for diabetes than hypertension in 2010. The total economic burden for hospitalizations from diabetes and hypertension in Jamaica for 2010 was estimated at J$272.18 million. This amount represents 54.5% of direct medical cost and 1.2% of the recurrent budget for the regional health authorities for 2010-2011. Persons aged 61-80 are more likely to be classified as having ACSC than other age groups, ($X^2$ 97.8, p<000). Females show a higher probability of having Ambulatory Care Sensitive Conditions, ($X^2$ 17, p<000).

Conclusions: ACSC is a good performance indicator of PHC because it reveals the rate and prevalence of non-communicable diseases (NCDs), the mediating factors and the cost to PHC and the society. More research needs to be done on NCDs because effective outpatient care would reduce the complications of severe diseases and the financial and social costs of hospitalization.
Introduction

This study examines the performance of Jamaica’s primary health care system by looking at ambulatory care sensitive conditions (ACSC) in the public health sector with specific focus on hypertension and diabetes. ACSC are medical conditions for which good outpatient care can potentially prevent the need for hospitalization, or for which early intervention can prevent more complications or more severe diseases. There are three main sets of ACSC. These are chronic conditions, acute conditions and vaccine preventable conditions. Independent of disease prevalence, lower rates of ACSC is a function of the supply of physician, disease burden and the propensity of patients to seek medical care [1]. This paper isolates and investigates the chronic diseases of diabetes and hypertension.

The ACSC patients with medical insurance have a longer hospital stay than ACSC patients without medical insurance [2]. ACSC has a greater association with socioeconomic status than with the characteristics of primary care [3]. There are also racial disparities in diabetes care. Whites received 76.9% of the recommended care for diabetes compared to Blacks who received 70% of the recommended care [4]. With regards to ACSC, Blacks have a higher rate of preventable hospitalizations for nearly all conditions than Whites regardless of gender and age. Risk for preventable hospitalizations for hypertension and asthma were particularly great among Blacks [5]. People with a family history of hypertension are more likely to develop hypertension than people without a family history of the disease. People with a family history of hypertension who do not exercise are at even greater risk of becoming hypertensive [6].

People with hypertension tend to believe that they have a risk factor for myocardial infarction or stroke rather than a disease. These patients also believe that they can control their blood pressure because they know their bodies. The hypertensive patients with diabetes think
that their hypertension is less important than their diabetes and their hypertension have minimal impact on their daily activities. Those without diabetes were most likely to choose a treatment that is the middle ground between their doctor’s advice and their own understanding of hypertension [7].

It is important to understand ACSC in Jamaica, particularly the chronic diseases of hypertension and diabetes because their high prevalence rate in the country. The study of ACSC in the public health sector facilitates a measurement of the quality of and access to primary medical care in the country. The study answers the following questions: what is the rate of hospitalizations for hypertension and diabetes in Jamaica? What is the likelihood of hospitalization from hypertension and diabetes in South East Regional Health Authority (SERHA)? What is ‘first’ estimate of economic burden of these occurrences on the Jamaican Health Sector? How useful is ACSC as a performance indicator for the management of non-communicable diseases (NCDs) at the primary care level? How do age and gender influence the distribution of ACSC for hypertension and diabetes?

Method

A stratified random sample of 285 hospitalization cases were drawn from the Ministry of Health person oriented database between 2008 and 2009. The principal diagnosis (ICD 10 codes) was used to identify hypertensive and diabetic hospitalizations in the parishes of Kingston and St. Andrew, St. Catherine and St. Thomas that make up SERHA.

Analysis was done to compare individuals with an ACSC related hospitalization specifically hypertension and diabetes to patients with non-ACSC related hospitalization. Bivariate logistic regression analysis was conducted to consider the variables of age and gender. A societal perspective was used to estimate cost. The cost of illness (COI) approach was used to
estimate the economic cost of hospitalization from diabetes and hypertension in 2010. The cost data was taken directly from hospitals included in the sample. A variant of years of potential life lost (YPLL) was applied to estimate the cost of lost earnings due to illness in a single year. The time horizon was kept only to one year because of the importance of showing the point in time burden associated with ACSC conditions.

The cost function was estimated as follows: 

\[ T_c = f(x_c, y_c, z_c) \]

Where,

- \( T_c \) is total cost (societal)
- \( x_c \) is direct medical cost
- \( y_c \) is direct non medical cost
- \( z_c \) is indirect non medical cost

The total cost is defined as the sum of all cost terms included above and the direct medical cost captures identifiable through the National estimates of expenditure, specifically staff cost for medical personnel and cost for all laboratory tests, diagnostic tests and pharmaceuticals. The direct non-medical cost refers to all other costs incurred as a result of a hospitalization episode, this includes dietary, portering, security, administrative and other overheads and the indirect nonmedical cost is defined as the all expenses incurred that can be linked indirectly to a hospitalization. For convenience this paper adopts the WHO recommended approach of using Years of Productive Life Loss as an all encompassing proxy for wider indirect cost estimates. GDP per capita was applied to capture value of life. This then informed the estimates of what indirect non medical cost could be both for the person hospitalized and also for the caregiver support..
The logistic regression model used was bivariate with independent variables age and gender. The dependent variable was hospitalizations in SERHA. The null hypothesis for age is that persons with ACSC and non-ACSC do not differ in age. The alternative hypothesis is that persons aged 61-80 have higher propensity for ACSC than younger persons. The null hypothesis for gender is that persons with ACSC are equally distributed by gender (there is no difference). The alternative hypothesis is that females show a higher propensity to exhibit an ACSC than males.

Results

The rate of ACSC for hypertension in SERHA was estimated at 177 per 100,000 hospitalizations, diabetes rates were higher at 325 per 100,000 hospitalizations, after controlling for co-morbidity rates. Overall approximately 1 in every 50 hospitalization in SERHA was an ACSC- diabetes or hypertension specific condition. The economic burden for hospitalization from diabetes in Jamaica for 2010 was estimated at J$ 157.94 million of which 61% represents direct medical costs. The economic burden for hospitalization from hypertension in Jamaica for 2010 was estimated at J$114.24M of which is 46% represents direct medical costs. The total economic burden for hospitalizations from diabetes or hypertension in Jamaica for 2010 was estimated at J$272.18 million. This amount represents 54.5% represents direct medical cost and 1.2% of the recurrent budget for the regional health authorities for 2010-2011.

The null hypotheses for age and gender were rejected. The older you get is the more likely you are to be hospitalized with an ACSC condition ($X^2=97.8\ p<000$). The younger age groups are less likely to have diabetes and hypertension by a factor of 0.3. Females show a higher probability of having ACSC than males because the odds of a female increased by a factor of 2.399 ($X^2=17\ p<000$).
Discussion

This study looked at the ambulatory care sensitive conditions of hypertension and diabetes in Jamaica to understand the public health system. The two ACSCs, hypertension and diabetes appear to occur frequently and so warrant further investigation. Of the economic burden of hospitalization for hypertension in 2010 61% was direct medical cost and this is 20% higher than the direct medical cost for the treatment of diabetes in that year. This shows the relative fiscal burden placed on the Government of Jamaica which oversees a general tax funded public healthcare system. The total economic burden because of hospitalization for these two ACSCs is J$272.18 million. More effective outpatient care is needed to treat these conditions and reduce hospitalizations because the total economic burden of hospitalization for diabetes and hypertension in 2010 is just over 1% of total recurrent budget for all four Regional Health Authorities in Jamaica. Effective outpatient care would reduce the likelihood of premature complications of severe diseases and the financial and social cost of hospitalization for hypertension and diabetes in the society. In fact it is posited that through a more effective and efficient primary care network, fiscal space can be created while simultaneously reducing the overall loss to the economy.

The total economic burden for hypertension and diabetes is 1.2% of the recurrent budget for the Regional Health Authorities for 2010-2011 which means that given the single year point in time calculation, the total economic burden is a much higher proportion of the recurrent budget if one begins to incorporate the lifetime cost of these hospitalizations, and equally as important, when calculations expand to other ACSC related to chronic conditions. There is a high likelihood of hospitalization for ACSC diabetes or hypertension in the parishes of Kingston and St. Andrew, St. Catherine and St. Thomas. Greater investment in the public health care
system would result in less money spent on avoidable hospitalizations and the total savings would be net of the investment required to improve the effectiveness of primary health care in Jamaica. The importance of improving outpatient care in the public health system is underscored by the fact that hypertension and diabetes are just two of the many illnesses that comprises ACSC. More research is needed to understand the economic burden of these other ACSCs on primary health care.

The positive relationship between aging and the likelihood of hospitalizations for ACSCs, particularly diabetes and hypertension means that older people would benefit more from the improvements in outpatient care in the public health system. The benefits to younger people would accrue over time. Improvements in primary health care would reduce the likelihood that younger people would be hospitalized for ACSC hypertension and diabetes when they get older. Less money would be spent over time on avoidable hospitalizations thereby reducing the disease burden.

The gender difference in hospitalizations for ACSC hypertension and diabetes, where significantly more females were hospitalized than males, may be due to greater positive health seeking behavior among females. Therefore, fewer males are diagnosed with ACSC hypertension and diabetes. An alternative explanation suggests that more women than men are educating themselves at the post-secondary level thereby making greater socioeconomic advances than men in the society. These women are more health literate and have greater financial means than men to engage in positive health seeking behavior. Improvements in outpatient care in the public health system for ACSC would benefit women more than men. More research is needed to understand why significantly more women than men were hospitalized for ACSC hypertension and diabetes.
The study of ACSC is a good indicator of the performance of the public health system because it reveals the rate and prevalence of ACSC related hypertension and diabetes in Jamaica, the differences based on age and gender, and the cost to the public health system and the society. This study is the first of its kind in Jamaica and the Caribbean to use the study of ACSC related hypertension and diabetes to assess the public health system. However, there are several limitations to the study. The patient administrative database used in the study is not relational. The sample size was small so generalization cannot be made and the costing exercise was macro in nature. Other non-communicable diseases (NCDs) that were classified as ACSC were excluded from the study. Future research should include the other illnesses that comprise ACSC, the gender and age differences in ACSC as well as other mediating factors. Future research should also include primary data such as patient physician relationship because the use of this data would allow for a more comprehensive understanding of other factors associated with ACSC. Future research should also look at a comprehensive estimation of the cost for ASCS conditions relating to non-communicable diseases. These studies should be done over a longer time period to estimate the average lifetime burden of ACSC in Jamaica. Some of these studies should use models that include income bands and geographical zones based on the prevalence of ACSC.

With accumulated research, the use of ACSC as an indicator of the effectiveness of the primary care system to adequately manage NCDs should grow in acceptance at the policy level. This acceptance should lead to a broader adoption of ACSC analysis in the performance of the public health care system and a greater appreciation of the importance of the primary care network. ACSC provides the empirical basis to inform relevant policy interventions so interventions to control NCDs should be developed. Any indicator of effectiveness must be
supported by the relevant mechanisms by which it is measured and monitored. ACSC should only be used as an indicator because it does not diagnose problems and it only points in the directions where further investigations are needed.

Conclusion

ACSC is a good index of primary health care performance in Jamaica. Diabetes and hypertension were prevalent with diabetes having a higher rate of prevalence in 2010. Hospitalization because of ACSC diabetes and hypertension in 2010 created an economic burden estimated at J$272.18 million. Hospitalization for hypertension, diabetes and other ACSC are preventable. Development of effective outpatient care in Jamaica would reduce the financial and social cost of hospitalization that is avoidable. More research is needed on the range of preventable ACSC hospitalizations and the range of mediating factors in the process. This data can guide health policy to reduce the complications of severe diseases and the disease burden by improving outpatient care in the public health system.
References


