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The Economic Burden of Heart Diseases in Latin America

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Abstract

Heart disease (HD) is currently the leading cause of death in the Latin American region and expected to remain so for future decades. HD imposes health care system and other costs to society through morbidity, premature mortality, caregiver costs and loss of productivity. The economic burden of heart disease in the Latin American region has not been previously quantified.

Objective: The study aim was to assess the economic burden of heart failure (HF), myocardial infarction (MI), atrial fibrillation (AF), and hypertension (HY) in Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Peru, Venezuela, and the cost effectiveness (CE) of structured telephone support (STS) and telemedicine (TM) for the treatment of HF.

Methods: The cost of four heart conditions by country was estimated using a prevalence approach for HF, AF and HTN, and an incidence approach for MI. This was done by estimating the number of people with HD in a base period (2015) and the costs associated with the condition in that period. The cost estimates included health system expenditures as well as other financial costs including productivity losses (absenteeism, lower workforce participation, premature mortality) and informal care costs. We also estimated transfer costs in order to better understand how costs were borne by government, individuals and society. Estimates were also made of the value of the loss of healthy life, measured in disability adjusted life years (DALYs) using global burden of disease disability weights. To estimate the number of cases of HD in the population, by age and gender, epidemiological data on prevalence or incidence rates were applied to population data. Data inputs were informed by a targeted literature review that provided country specific disease estimates and a data scan and amalgamation of Organisation for Economic Co-operation and Development, World Health Organization and regional estimates. Estimates were triangulated using semi-structured interviews with clinicians, insurers and health administrators.

Results: Accounting for co-morbidities, these HDs were found to affect approximately 89.6 million people in 2015 in selected countries (28% of the adult population). This leads to significant wellbeing loss, estimated at 6.8 million DALYs, and economic burden, estimated at totalling $30.9 billion USD in 2015. The cost effectiveness analysis suggests TM and STS are both cost effective treatment options for the management of patients with HF.

Conclusion: HD imposes a significant burden to the health system and society. Prevention and appropriate management of HD would result in significant benefits both in improved wellbeing and economic savings.

Introduction

- Heart conditions impose physical, social, financial, and health related quality of life limitations on individuals affected. These conditions result in an economic burden and impact on society due to expenditures on health care treatment, productivity losses from employment impacts, costs of providing formal and informal care, and lost wellbeing.[1,2]
- Common risk factors for heart disease are: tobacco intake; high cholesterol; obesity; high blood pressure; diabetes; alcohol intake; dietary factors; physical inactivity and depression.[3-6]

Objective

- The economic burden of heart disease in the Latin American region has not been previously quantified. This study assessed the economic burden of the four main heart conditions: HTN; HF; MI; and AF in Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Peru, and Venezuela. In addition, the cost-effectiveness of TM and STS for the management of HF was assessed for each country.

Methods

Burden of heart diseases

- The burden of heart disease in each country, which is a function of the number of people with the disease and associated costs in a base period (2015), was estimated using standard methodology which applies a prevalence approach for HF, AF and HTN, and an incidence approach for MI.

Figure 1.1 High level methodology
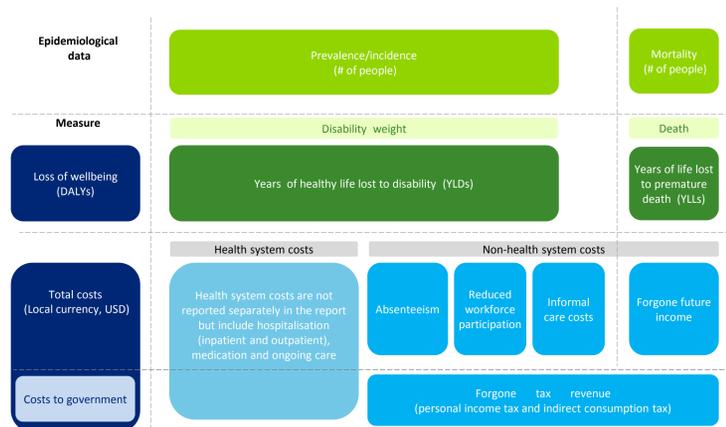
Cost-effectiveness of interventions

- The network meta-analysis and economic evaluation of home TM and STS programs after discharge in patients with HF, conducted by the National Institute for Health Research in 2017[7] was used as the basis for a cost effectiveness analysis.

Data sources

- The analysis was informed by a targeted literature review, data scan and modelling, with inputs and methods validated through a consultation process in each of the countries with representatives of hospitals, health organizations and societies.

References
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Results

Figure 2: The impact of heart conditions on selected countries, 2015

Mexico
Prevalence (% population): 20.46m (25.6%)
Health cost: USD 2.8bn
% of total health spending: 3.6%
Productivity losses (%/GDP): USD 3.3bn (0.3%)
Lost wellbeing ('000 / % DALYs): 1,625 (5.4%)

Colombia
Prevalence (% population): 5.63m (17.4%)
Health cost: USD 1.44bn
% of total health spending: 6.6%
Productivity losses (%/GDP): USD 0.97bn (0.3%)
Lost wellbeing ('000 / % DALYs): 564 (4.7%)

El Salvador
Prevalence (% population): 1.05m (27.3%)
Health cost: USD 0.16bn
% of total health spending: 8.5%
Productivity losses (%/GDP): USD 0.08bn (0.3%)
Lost wellbeing ('000 / % DALYs): 89 (5.0%)

Venezuela
Prevalence (% population): 6.53m (33.4%)
Health cost: USD 0.52bn
% of total health spending: 2.2%
Productivity losses (%/GDP): USD 1.15bn (0.2%)
Lost wellbeing ('000 / % DALYs): 547 (7.1%)

Panama
Prevalence (% population): 0.73m (29.0%)
Health cost: USD 0.13bn
% of total health spending: 3.4%
Productivity losses (%/GDP): USD 0.14bn (0.3%)
Lost wellbeing ('000 / % DALYs): 54 (5.9%)

Brazil
Prevalence (% population): 45.66m (32.0%)
Health cost: USD 10.90bn
% of total health spending: 5.5%
Productivity losses (%/GDP): USD 6.43bn (0.4%)
Lost wellbeing ('000 / % DALYs): 3,242 (5.9%)

Ecuador
Prevalence (% population): 1.40m (14.0%)
Health cost: USD 0.23bn
% of total health spending: 2.5%
Productivity losses (%/GDP): 0.39bn (0.4%)
Lost wellbeing ('000 / % DALYs): 137 (3.2%)

Peru
Prevalence (% population): 3.19m (16.0%)
Health cost: USD 0.24bn
% of total health spending: 2.1%
Productivity losses (%/GDP): USD 0.69bn (0.4%)
Lost wellbeing ('000 / % DALYs): 282 (4.0%)

Chile
Prevalence (% population): 4.94m (38.0%)
Health cost: USD 0.79bn
% of total health spending: 4.2%
Productivity losses (%/GDP): USD 0.56bn (0.2%)
Lost wellbeing ('000 / % DALYs): 269 (6.8%)

Four conditions

Prevalence of four heart conditions

- HTN has the highest prevalence of the four conditions in all countries. HTN was the main contributor to the variation in rates by country.

Financial costs on society

- Total financial costs as a result of the selected conditions were 30.9 billion USD.
- Health system costs took up 4.7% of all health spending for the nine countries.
- Productivity losses were the equivalent of 0.3% of the combined gross domestic product of the nine countries.
- MI imposes the greatest financial cost (12.6 billion USD), followed by HF (10.7 billion USD), HTN (5.3 billion USD) and, finally, AF (2.4 billion USD).
- Heart conditions impose a significant burden on society with most countries having non-health system costs greater than health system costs. Health system costs contribute to the majority of total financial costs of heart diseases in Brazil, Chile and Colombia.

Wellbeing loss of selected heart conditions

- The selected heart conditions impose a substantial wellbeing loss of 6.8 million DALYs, after adjusting for comorbidities, equivalent to 5.5% of all DALYs for the selected countries.

Heart failure

Impact of heart failure and cost effectiveness of interventions

- 6.5 million people in the Latin American region had HF in 2015 and the average age of an individual with HF in each country ranged from 61 in Venezuela to 65 in Chile.
- HF health system costs and productivity losses were usually the second most expensive of the four conditions studied.
- HF imposed the most significant care giver burden of all the conditions studied, ranging by country from 11 million USD in El Salvador to 741 million USD in Brazil with an average of 126 million USD.
- Income losses for those with HF ranged by country from 11 million USD in El Salvador to 1.1 billion USD in Brazil with an average of 453 million USD.
- HF productivity impacts resulted in government taxation forgone ranging by country from 3 million USD in El Salvador to 431 million USD in Brazil with an average of 112 million USD.
- In all cost-effectiveness analyses performed, both TM and STS were found to be cost-effective treatment options.

Table 1: The impact of heart failure on selected countries, 2015

	Brazil	Chile	Colombia	Ecuador	El Salvador	Mexico	Peru	Panama	Venezuela
Financial costs (USD millions)									
Health system costs	4458	204	275	58	26	481	57	23	88
Productivity losses	2361	185	353	170	26	1240	251	51	434
Total cost	6819	389	628	228	51	1721	308	73	522
Loss of wellbeing ('000)									
YLD	271	25	67	21	7	152	41	5	37
YLL	251	12	31	14	3	60	23	3	19
DALY	522	37	98	34	11	212	64	8	56
Population ('000)									
Prevalence	2,846	260	648	199	76	1,599	397	50	391
Mortality	23	1	3	1	0.4	7	2	0.3	2

Numbers may not sum due to rounding.

Conclusion

- Heart conditions impose substantial loss of wellbeing and financial costs in Latin America and should be a public health priority.
- Myocardial infarction imposed the greatest financial cost, followed by heart failure, hypertension and atrial fibrillation.
- Prevention or better management of heart conditions would result in significant benefits both in improved wellbeing and economic savings.
- Telemedicine and structured telephone support are cost effective mechanisms for achieving improvements in the management of heart failure.

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