

## Current Comments

# Geriatric outpatient healthcare: hierarchical demand structuring

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### Abstract

In Brazil, the rapid growth of the elderly population has been causing a great impact on the healthcare system, with increased costs and service utilization. The inefficiency of traditional models for geriatric healthcare has made it essential to change the healthcare concepts for this population. This can take place through the development of new healthcare models that include the means to identify, assess and treat elderly patients with a variety of morbid and functional conditions, and which can be applied diverse healthcare scenarios. An outpatient model is proposed, with two stages that differ in the depth and coverage of their actions. These stages are organized as increasing levels of complexity and are capable of selecting subgroups of individuals that, because of their risk characteristics, should follow different paths through the healthcare structure. This paper discusses the first stage of this model, which involves risk identification among large groups of elderly people, by means of structuring a hierarchical flow of actions and using assessment tools of adequate sensitivity and specificity. Individuals aged 65 years or over who are detected through walk-in outpatient consultation, home visits or telephone interview are classified using a rapid screening risk evaluation instrument composed of eight items. Depending upon the level of risk presented, the individual will either be referred to another level of functional evaluation (medium-high and high risk levels), or to normal clinical care and old people's community centers (low and medium risk levels). The second stage will be the subject of a subsequent paper.

## INTRODUCTION

Aging is a challenge around the world today, affecting both rich and poor countries. The aging process of the world's population originated from the socio-economic transformations experienced by different countries last century. Nonetheless, significant modifications in demographic variables were only produced around the end of the twentieth century.<sup>11,15,25</sup>

Following patterns seen in other countries, in Brazil the decline in fertility and increase in life expectancy have, over the last 30 years, resulted in an absolute and relative increase in the elderly population. By the year 2020, it is estimated that Brazil will have a population

of 32 million people aged 60 years or over. The growth in this segment of the population will give Brazil the sixth highest aging rate in the world.<sup>10,15,25</sup>

The rapid growth in the elderly population in Brazil is causing a significant impact throughout society, and especially on healthcare systems. However, the infrastructure needed for responding to the demands of this age group, with regard to quantitatively and qualitatively adequate installations, specific programs and human resources, is still precarious. Accompanying the demographic transformations, Brazil has experienced important alterations in its conditions of morbidity and mortality, known as an epidemiological transition.<sup>23</sup> This has caused

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chronic-degenerative diseases to occupy the top positions today, in the ranking of disease occurrence and causes of death.

The objective of the present work is to describe a model for geriatric healthcare based on the systematic application of tools for evaluating the risks of becoming ill and losing functional capacity. The model works by stratifying the target population into categories with differing likelihood of morbidity and mortality, and thereby allowing interventions to be segmented as a function of these risk categories. An outpatient model is proposed, with two stages that differ in the depth and coverage of their actions. These stages are organized as increasing levels of complexity and are capable of selecting sub-groups of individuals that, because of their risk characteristics, should follow different paths through the healthcare structure. This paper discusses the first stage of this model, which involves risk identification among large groups of elderly people, by means of structuring a hierarchical flow of actions and using assessment tools of adequate sensitivity and specificity.

## COSTS OF AGING

As part of the global crisis in the healthcare system, geriatric healthcare presents the significant bottleneck of highly repressed demand for specialized outpatient attendance. This creates growing difficulty in correctly identifying which elderly people are at risk of becoming ill and dying prematurely. In addition, only a small number of healthcare professionals are qualified to treat the elderly, and this has decisively contributed towards the difficulties in adequately dealing with such patients.

The majority of Brazilian institutions for teaching in the field of healthcare have not yet woken up to the present process of demographic transition and its medical-social consequences. They do not offer adequate gerontological content in their undergraduate courses. Consequently, the shortage of technical and human resources for facing up to the explosion in the population group over the coming decades is increasing.

The healthcare system is not structured to meet the growing demand from this age group. It is known that the elderly make greater use of healthcare services, their hospitalization rates are much higher and their average hospital bed occupancy is much longer than

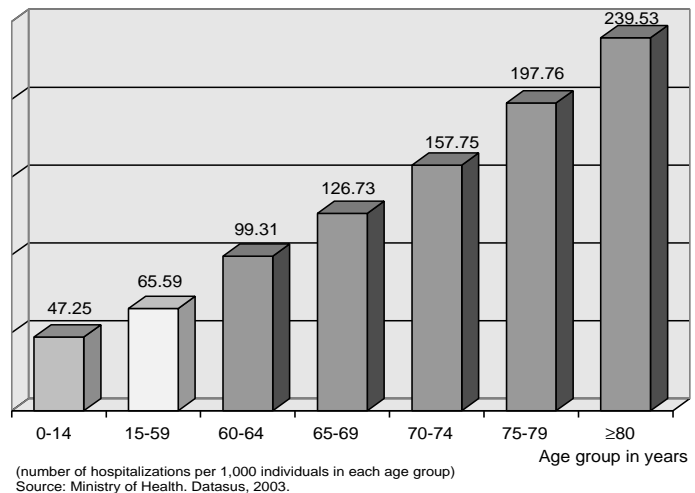


Figure 1 - Hospitalization coefficient by age groups. Brazil, 2002.

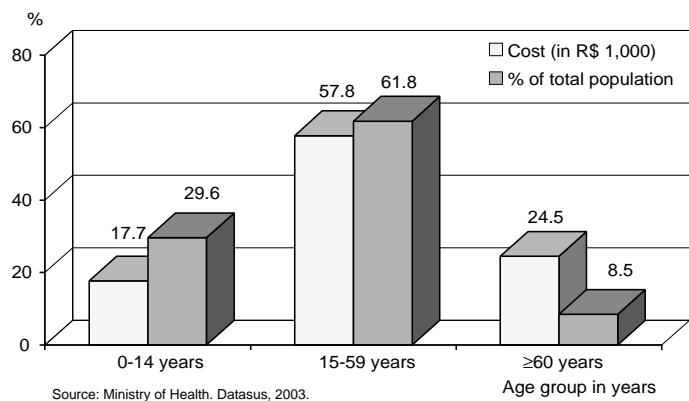


Figure 2 - Cost of SUS authorizations for hospitalization compared with proportion of the population. Brazil, 2002.

for any other age group.<sup>10</sup> The lack of home-based or outpatient services means that the first attendance takes place in hospitals, at an advanced stage, thereby increasing the costs and decreasing the chances of a favorable prognosis. In other words, they consume more resources than needed, and raise the costs without necessarily obtaining the expected results in terms of recovery of health and improvement of quality of life.<sup>27</sup>

As examples, the resources invested in hospitalization are highlighted here. According to data furnished by the Brazilian National Health System (*Sistema Único de Saúde*, SUS) in 2002, 18.6% of the total number of hospitalizations registered through the SUS authorization form were for individuals aged 60 years or over, for a elderly population of just 8.5%. In comparison, 20.9% of the hospitalizations were for children aged zero to 14 years, for a population of 29.6%, and 60.5% of the hospitalizations were for the age group of 15 to 59 years (61.8% of the total population). Other indicators also show the same trend, i.e. greater pressure from the elderly popula-

**Table 1** - Comparison between utilization indicators and hospitalization cost, by age group. Brazil, 2002.

Age group (years)	Mean length of hospital stay (days)	Hospitalization index* (days)	Mean cost (R\$)	Cost index** (R\$)
0-14	5.8	0.23	391.06	18.48
15-59	5.8	0.40	440.75	28.91
60 and over	7.6	1.11	605.37	88.90

Source: Ministry of Health. Datasus, 2003

\* Number of days of hospitalization consumed per individual per year

\*\* Hospitalization cost per individual per year

tion on various aspects of hospitalization costs (Table 1, Figures 1 and 2).

It can also be highlighted that, in 2002, around 23% of the total number of hospitalizations were due to childbirth and puerperium, which are predominantly in the age group of 15 to 59 years. Most of these are not due to illnesses, and they inflate the number of hospitalizations in this age group.

No matter which indicators are examined, the costs and service utilization are always greater for the elderly. A study by Gordilho et al<sup>10</sup> also found these trends. From analysis of some historical series, it can be seen that, while some indicators improve within other age groups, such patterns are not reflected among the elderly. These historical series, made available by the SUS Department of Information and Computing (Datusus), show the evolution through time of the indicators described above. Over a five-year analysis period, the elderly are characterized as major consumers within the healthcare sector. The demand pressure from this segment is therefore not of recent origin.

## HEALTHY AND FRAIL ELDERLY PEOPLE

The immense majority of elderly people are in good health, in relation to their age. Veras,<sup>28</sup> in a study conducted in Rio de Janeiro, found that 82.5% of the elderly people did not report severe loss in functional capacity. This finding is coherent with results from other studies that utilized similar methodology.<sup>7,25,26</sup>

However, the generalization of this characterization is deceptive, since the elderly do not form a homogenous population, with regard to their use of healthcare services. A substantial proportion of the utilization is due to demand generated by a relatively small subgroup.

It is therefore necessary to formulate new concepts for attending to the health of the elderly population, to be able to encompass the different health conditions of this age group, while respecting their special and particular characteristics. The classical models of promotion, prevention, attendance and rehabilita-

tion cannot be mechanically transposed to groups of elderly individuals, without making some important and significant adaptations.

Outpatient and home-based care, intermediate types of support and the hospital structure are fundamental for reestablishing health. The understanding that healthcare actions aimed at healthy old people must be prioritized, in conjunction with qualified programs for those who are already ill, is a healthcare concept accepted by many health administrators but not implemented very much so far.

Change in the healthcare attendance concepts for the elderly population is essential, since the traditional models centered on hospital attendance and/or sheltered housing have now been shown to be inefficient. The insistence on maintaining the present model, far from solving the problem, has ended up making it worse.

On the other hand, in constructing this new model, it is essential to take into consideration the differences in the state of individual elderly people's health. If, on the one hand, around 80% of the elderly population can be considered healthy, studies have shown that between 10 and 25% of this population have clinical conditions that identify them as frail individuals who require intensive care, at high cost. It is this diversity of risks and use of the healthcare systems that, in the United States, has the result that 5% to 10% of old people are responsible for 60% to 70% of the total expenditure on healthcare for the elderly population.<sup>4,9</sup>

Frailty, as a clinical syndrome, must be seen as a set of manifestations, such as weight loss, weakness, fatigue, inactivity, reduction in food intake, sarcopenia, balance and walking problems, precarious physical condition, osteopenia and others. Together, these are highly predictive of a variety of adverse events, such as hospitalization, acute diseases, falls, fractures and high mortality.<sup>9</sup>

Thus, there needs to be special focus on the frail elderly, and a healthcare attendance model for the elderly must be sought that incorporates among its objectives the identification, evaluation and treatment of

this segment, and which can be applied to a wide variety of types of attendance. From the public health point of view, this type of practice has arisen on the basis of a new concept of healthcare that is more appropriate for providing the tools to put into operation a healthcare policy for the elderly.<sup>8,10,12,18</sup>

## NEW HEALTHCARE MODEL FOR THE ELDERLY

With the growing demand from the oldest age group, the healthcare services network must become adapted to the present demographic and epidemiological profile, thereby expanding the offer of specialized geriatric care, with a strong focus on rehabilitation. The basic attendance network must be capable of identifying elderly people who have become frail, i.e. those at greatest risk of developing functional incapacity. It must also efficiently follow up those at lower risk, in parallel with developing actions and activities for health education and promotion.

An efficient healthcare model for the elderly therefore needs to be constructed by starting from its own logic, which includes activities organized within a hierarchically structured flow. Such activities, although they may be performed independently, are interrelated.

This set of actions is formed by a flow of activities for health promotion and the prevention, monitoring and treatment of diseases, along with referrals to geriatric evaluation and rehabilitation centers.

This model incorporates up-to-date technologies relating to the identification, evaluation and treatment of the elderly, thus reflecting the changes in the care concepts for the elderly population.

The model proposed has an outpatient nature, with two stages that differ in the depth and coverage of their actions. These stages are organized as increasing levels of complexity and are capable of selecting subgroups of individuals that, because of their risk characteristics, should follow different paths through

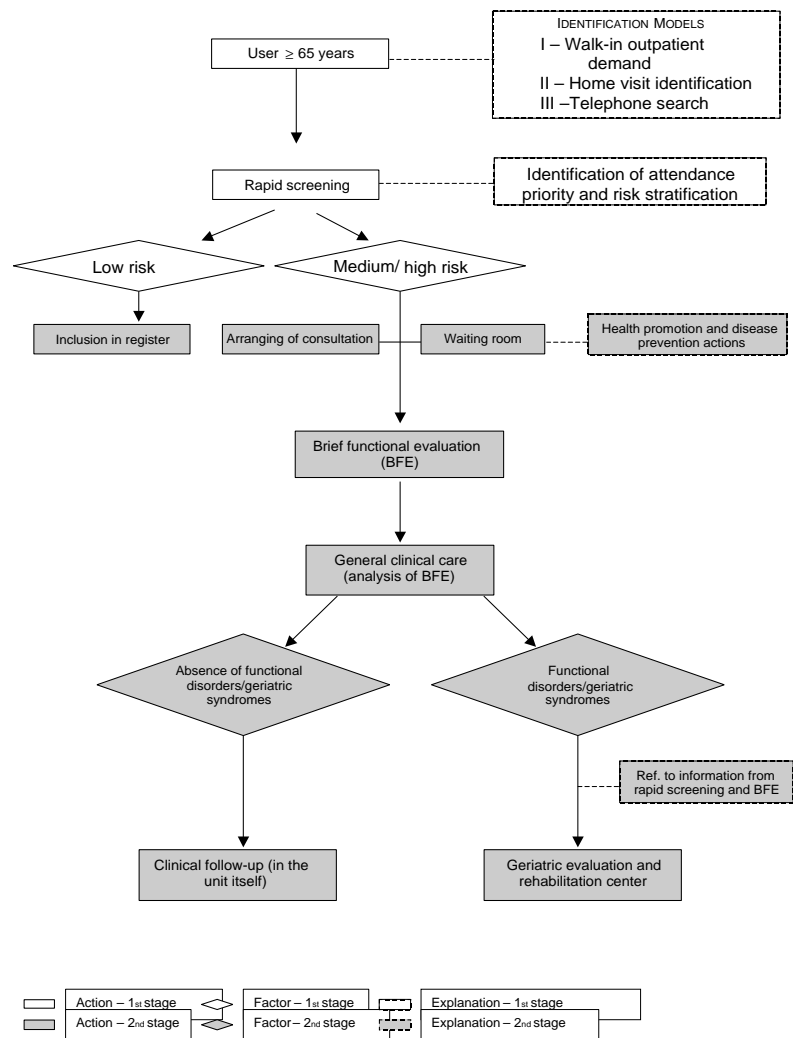


Figure 3 - Integrated healthcare flow for the elderly.

the healthcare structure.

The first stage, which is discussed in detail in the present study, involves risk identification among large groups of elderly people. The second stage, which will only be outlined here, will be presented in details subsequently, in a specific article that will discuss actions aimed at evaluating, diagnosing, planning and carrying out therapeutic interventions among the individuals selected during the preceding stage (Figure 3).\*

The aging of the population is not limited to a certain stratum within the population. Thus, the model must not be restricted to any given sector, and should be applicable both to the public and the private healthcare sectors. Likewise, a flow of activities and procedures that is considered ideal is proposed, which would function as a set of organized and hierarchically structured actions. However, this does not mean that the

\*Hospital care is not considered in the proposal presented in these articles.

stages would not work in isolation, and they may be adapted according to the needs of the services.

In thinking of a different type of healthcare for the elderly population, it needs to be considered that it should be possible to use it within different scenarios, in different attendance models, and that it is sufficiently flexible for its characteristics to be adapted without losing its own identity. Thus, outpatient attendance for the elderly may, within the public healthcare system, be given within the more traditional and hegemonic models, or the more innovative models, such as the Family Health Care Program, which, by giving priority to the home, forms an excellent strategy for identifying elderly people who have become frail.<sup>17</sup>

With the objective of covering a large proportion of the elderly and becoming viable within the different healthcare service structures that exist in Brazil, three possibilities are envisaged for elderly people to enter this new attendance structure. In the first of these, the elderly can be identified when they go to a healthcare unit with some specific requirement. The second form of access is by means of home visits, by the community healthcare agents, within the Family Healthcare strategy. Finally, the third possibility aims to adapt to the needs of healthcare operators in the private sector, which have call center services already structured and implemented, such that patients can be reached by telephone.

## FIRST STAGE – IDENTIFICATION AND RAPID SCREENING

### Elderly populations and the probability of rehospitalization

In 1993, Boulton et al<sup>1</sup> studied the probability of re-admission to hospital (Pra) in half of a multi-stage probabilistic sample (old people aged 70 years or over). Among the variables analyzed, eight were shown to be predictive of multiple hospitalization, when subsequently applied to the other half of the sample,<sup>1</sup> among users of public systems,<sup>21</sup> or among users of private healthcare plans.<sup>22</sup> Furthermore, the test-retest reliability of the Pra was high when the questionnaire was again sent out by mail, three weeks later.<sup>3</sup>

In the same way, individuals who were considered to be at high risk (Pra > 0.40) were benefited by rehabilitation interventions in special geriatric units, in comparison with those that did not receive such care.<sup>2,5</sup> These interventions were done at reasonable cost and produced satisfaction among the patients.<sup>4</sup>

Thus, it can be stated that the work by Boulton et al<sup>1</sup> has suggested a brief instrument for measuring the probability of rehospitalization, and that this method has been shown to represent a proxy for states of clinical frailty. It is thus suggested that this method is suitable for use as part of the risk evaluations among elderly populations.

### Elderly people and risk tracking

The set of variables utilized by Boulton et al<sup>1</sup> therefore appears to have appropriate characteristics for the identification stage, considering that: 1) it has already been tested on elderly populations within the healthcare system that had different origins; 2) it can be applied quickly (two to three minutes); 3) it classifies the individuals assessed into risk categories; 4) it allows different levels of intervention to be organized via objective criteria; 5) it enables attendance priority determination; 6) it can easily be standardized; 7) it can easily be understood when training interviewers; and 8) it can be applied face-to-face with the interviewee, or by telephone or letter.

After direct translation from the English language, the eight variables, which here are called Rapid Screening,<sup>\*</sup> were tested on an outpatient population, albeit in a preliminary manner, particularly in order to assess some of their operational characteristics.<sup>28-30</sup>

Regardless of the very preliminary nature of these studies, some aspects of these clearly indicated that this instrument was appropriate for the intended objectives, thus suggesting that they should be used in other “gateways” to the system, such as the three identification methods listed (Figure 3).

In these different environments, rapid screening could be applied to all elderly individuals using these sectors of the healthcare system. Rapid screening allows for great flexibility, given that the interviewers can be nursing auxiliaries, community healthcare agents or telephonists who have been trained in the outpatient methods for Family Healthcare and telephone search, respectively.

In the integrated healthcare flow for the elderly (Figure 3), for any of the three identification methods, a consultation will be arranged if the degree of risk warrants this. At this consultation, another stage of the functional evaluation will be carried out. Low-risk users will become part of a control file, available for subsequent contact, or will be referred for a variety of activities at an old people's center.<sup>6,14,24</sup>

\* A copy of the Rapid Screening questionnaire can be obtained from the first author of the present article.

In defining the cutoff points for the instrument, Boulton et al<sup>1</sup> took into consideration the specificity and sensitivity found. They suggested a limit of 0.5 for dividing between high and low-risk groups, so as to optimize the relationship between the numbers of individuals selected and the expected results to be controlled for. On the other hand, for referrals of old people to evaluation and geriatric rehabilitation units, they utilized a cutoff point of 0.40.<sup>5</sup>

However, in the model presented here, which is strongly centered on the organization that covers the demand, it is proposed as a working hypothesis that four cutoff points be utilized for organizing the multiple healthcare demands of the elderly population, so as to identify elderly people who have become frail or are at risk of becoming frail, and to create differentiated risk categories. Thus, this enables clear separation between individuals at greater risk and therefore in need of immediate intervention, and those with conditions that allow appointments to be made for intervention on a later date. Such ranking allows care priorities to be established and the use of diagnostic and rehabilitation resources to be optimized.

The questionnaire is capable of identifying individuals with serious diseases and those at risk of developing serious diseases. The scores obtained from different individuals, when placed in order, define those that are at higher or lower risk. Such progression in the ranked scores can be assumed, considering that as the probability increases (numerical value), the risk also increases. The proposed limits are described in Table 2. In this scheme, priority care is given to old people who present high risk, while putting the other attendance on a scale such that those identified as being at higher risk will be seen before those at lower risk.

This concern is even more relevant if we recall that, in certain operational environments such as the outpatient services of the public network, the demand for consultations exceeds the offer. There is a need to create priority criteria that are linked to the nature of the demand and not to the simple and non-functioning rule of "first come first served". Thus, this instrument will also function as an organizer for the services and, moreover, will furnish information for greater efficiency in the attendance rooms.

## SECOND STAGE – BRIEF FUNCTIONAL EVALUATION

After applying the rapid screening, the arranging of consultations will, as already described, proceed according to the priorities established from the risk

**Table 2** - Risk strata relating to becoming frail: classification proposal.

Level	Pra	Risk stratification
Risk 0	<0.300	Low
Risk 1	0.300 to 0.399	Medium
Risk 2	0.400 to 0.499	Medium-high
Risk 3	≥0.500	High

Pra: probability of readmission to hospital

criteria. While patients await the consultation, in the waiting room, characterization activities will be conducted, with emphasis on matters that are relevant and pertinent to health promotion and disease prevention.

As part of the therapeutic process, activities in the waiting room form an excellent mechanism for health education, and can greatly assist in getting users involved in healthcare actions that are indicated for maintaining the individual's autonomy and independence. At the same time, such activities make use of users' precious space and time, while waiting for attendance by the professionals who make up the team.

It can be said that the waiting room activities are informal. Their principal objective relates to the democratization of information, slanted towards health promotion and disease prevention. These types of outpatient activities can be done by any member of the healthcare team. They consist of a space for exchanging experiences and learning about relevant topics that are capable of assisting users to become aware of the aging process and its repercussions on their health.

These topics should preferably be those inherent to the aging process, with emphasis on geriatric syndromes and health problems that are more common within this age stratum, such as diabetes, hypertension and osteoporosis, among others. In addition to this, topics suggested by the users themselves can and should be selected.

Before the medical consultation, the elderly individual is attended by a healthcare professional with adequate prior training, for a functional performance evaluation by means of a tracking instrument for evaluating functional capacity, named brief functional evaluation (BFE) (Figure 3).

The BFE is an instrument made up of 11 items, each evaluating one specific area. The items are eyesight, hearing, arm and leg function, urinary continence, nutrition, mental state, emotional disturbances, activities of daily life, home environment and social support network.<sup>13,16</sup> The BFE consists of a set of questions and performance tests that, when assessed against other

realities, have been shown to be highly sensitive for detecting disorders in the pertinent areas.<sup>19,20</sup>

In Brazil, after direct translation from the original, the BFE has been utilized for tracking functional disorders in geriatric outpatient services of university hospitals.<sup>16</sup>

In the present model, the BFE will be analyzed by a clinical doctor who, after training, will be qualified to identify whether the elderly individual can be followed up in this healthcare unit, or whether, because of the significant functional disorders and/or geriatric syndromes identified, the individual should be referred to specialized or local centers where there are professionals qualified in geriatric evaluation and rehabilitation. Specific procedures will be performed in these locations, habitually systematized for full geriatric evaluation.

When no functional disorders or alterations are identified, the follow-up can be done by the clinic, with special attention to modifications in this initial condition. Correct identification of individuals who are at lower risk allows there to be adequate follow-up for those who have become more frail and will gain more benefit from attendance given by specialists, considering that there are still insufficient such specialists in relation to the growing numbers of old people.

## FINAL CONSIDERATIONS

The country's great backwardness in its social agenda and, as a byproduct, in its healthcare agenda, and in particular the agenda for tasks aimed at producing models and structures for geriatric care, makes this need urgent and compelling. Nonetheless, quality

must not be neglected in drawing up such models, in such a way that, while taking advantage of existing experiences, rigorous evaluation of these within Brazilian realities and the seeking of alternatives to the existing models must not be neglected.

The strength of the proposal presented here lies generically in its deep understanding of the heterogeneity that characterizes the elderly population, the high cost of healthcare procedures destined for this population and the diversity of the expenditure on subgroups of this population. On the other hand, its value also lies in the certainty that, without a preventive approach that associates epidemiological reflection with systematic planning of healthcare actions, there is no possible way out from the funding crisis of the sector.

More specifically, the positive quality of the present work is its attempt to identify standardized instruments that could be utilized systematically and be organized so as to produce risk series of increasing complexity. On the other hand, the coverage of the proposed actions will allow the health problems of a large proportion of the elderly population to be taken into account.

Although the eight variables identified by Boulton et al<sup>1</sup> as significantly related to the probability of multiple hospitalizations and, by inference, to the probability of clinical frailty have a face value that establishes them among aging specialists, they should not in the first instance enjoy universal application. There is a need for similar efforts to be made in Brazil for evaluating a greater number of characteristics within the country's realities, so as to verify the adequacy of the method for the objectives of functional and morbidity categorization among our aged population.

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