DISABILITY-BASED CASEMIX FOR ELDERLY PEOPLE IN INTEGRATED CARE SERVICES

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Abstract

Objective: To develop a disability-based casemix for elderly people in an integrated service delivery system.

Methods: Disability profiles were determined by submitting the 29 items of the SMAF to cluster analysis and standardized validation procedures. The data came from a stratified multistage sampling of 1977 elderly people with disabilities living in different environments (own home, intermediate facilities and long-term care institutions) and regions (metropolitan, urban and rural). Standardized instruments were used to measure disabilities, the care and services required and received by each subject, and costs (health care, infrastructure, functioning, administrative support).

Results: 14 ISO-SMAF profiles were generated. From the first to the last profile, we observed a decreasing mean level of autonomy from 9.33 (s.d. = 3.58) to 73.77 (s.d.= 3.61) on the SMAF scale (/87). The first two groups showed disabilities mainly on IADL while group 14 showed a significant loss of autonomy on all dimensions of the SMAF. Between these extremes, we observed a gradual progression of disabilities in IADL and ADL accompanied by greater disability either in mobility functions or mental functions.

Discussion: This is a simple and quick system, accessible to management at all levels, to allocate care and services and direct elderly clients with regard to their care needs.

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<u>Introduction</u>

In many countries, the percentage of elderly individuals is increasing, and hence there is a demand for useful and simple ways of visualizing the elderly with disabilities, which may suggest how services might be economically and effectively allocated (Lefebre & Soderstrom, 2000). To develop such a method, decisions have to be made regarding the different types of care and services which should be provided for this clientele (Bélanger, Bolduc, & Trahan, 1991; Trahan 1997). Thus, there is a need for a clinical management system that provides uniform, standardized data for decision-making and is sensitive to the availability and suitability of alternative services in a given area. However, as healthcare delivery systems started to rapidly change, merge, and integrate, it became crucial to provide pertinent information in a process of integrated care (Hollander, 1996). This information should also make it possible to allocate human, material, and financial resources according to the needs of a specific population rather than according to norms or indirect indicators (Berthiaume, 1996). Consequently, it is essential to obtain an indicator based on the actual needs of this population. To develop such an indicator, one of the strategies adopted was to define and classify the clientele for a service (such as a nursing home) into groups of individuals who possess common characteristics, need approximately the same mix and level of services, and require similar resources. From this we get the term casemix (Dilts, Khamalak, & Plotkin, 1995; Maddox & Kapodia, 1996). The number of individuals in each of these groups can then be used to estimate the resources required for each region (Jolliffe, Jones & Morgan, 1982) and also to measure costs for reimbursement purposes, such as RUG (Resource Utilization Group) type systems which are used in the context of long-term care (LTC) in the U.S., or the AGGIR system (Autonomie,

Gérontologie, Groupes Iso-Ressources) in France (Fries, Schneider, Foley, Gavazzi, Burke, & Cornelius, 1994; Carpenter, Main, & Turner, 1995; Coutton, 2000).

However, although these systems – especially the RUG III – are in widespread use, they were developed to meet the specific characteristics of the health care system involved, which gives rise to various questions regarding their development, for example, the choice of sample, analysis method, measurement of resources, or classification variables used (Hornbrook, 1989; Dubuc, Hébert, Desrosiers, & Buteau, 2001). Not only do the patient population and nature of care differ substantially between U.S. nursing homes and similar settings in other countries, the RUG IIIs were not developed in the context of an integrated care system which could respond to the needs of the elderly with disabilities in all types of resources (own home, intermediate facilities, LTC institutions).

Currently, the measurement of functional autonomy is used as a basis to establish admissibility to long-term services in many countries and is considered essential in geriatric evaluation (Lagergren, 1993; Berdea, 1996; Morris, Sherwood, May, & Bernstein, 1987). The Functional Autonomy Measurement System (SMAF: Système de mesure de l'autonomie fonctionnelle) is an instrument that evaluates not only activities of daily living, mobility, and communication, but also mental functions and instrumental activities of daily living (Hébert, Guilbault, Desrosiers, & Dubuc, 2001a). With the goal of applying an information system that meets the needs of health professionals and managers in continuous LTC settings, a study was conducted to develop a casemix based on the functional autonomy profile – ISO-SMAF user profile – associated not just with the utilization of resources – ISO-SMAF resources profile – but also with the cost of these resources – ISO-SMAF cost profile. In developing ISO-SMAF user profiles, our objective was to generate a casemix with a

limited number of categories that discriminate between the types of resources required and can be applied in any setting that provides long-term care in an integrated service delivery system. It must also be of practical day-to-day use for individual care providers and minimize the evaluation time needed for data gathering. Finally, it must improve management of clinical, operational, and financial LTC resources for seniors.

Methodology

Database

The data used for the development of this casemix were obtained from a previous study (Hébert et al., 2001b). A stratified multistage sampling strategy was applied to 1977 elderly people over 65 with disabilities (defined as a score over 4 on the SMAF disability scale) living in different environments (own home, intermediate facilities, LTC institutions) and regions (metropolitan, urban and rural). The subjects were evaluated by trained research nurses who used uniform, standardized and well-validated instruments to measure disabilities, and the care and services required and received by each subject. The cost estimation (Canadian dollars per day) included costs associated with care, functioning, infrastructure and administrative support.

Instruments and methods

The 29 items of the **SMAF** were used as the principal variables for the classification. This instrument was developed from a functional concept of health and the World Health Organization's classification of impairments, disabilities, and handicaps (Hébert, 1982). It evaluates 29 functions

covering activities of daily living (ADL) (7 items), mobility (6 items), communication (3 items), mental functions (5 items), and instrumental activities of daily living (IADL) (8 items). Each function is rated on a 5-point scale ranging from 0 (autonomy), 0.5 (difficulty), 1 (need for stimulation or supervision), 2 (assistance), to 3 (total assistance or dependence), according to precise criteria derived from information obtained through interviews with and observation of the subject or by interviewing a third party (Hébert, Carrier, & Bilodeau, 1988a). Summing the ratings assigned to each function gives a total score out of 87. This instrument has undergone several tests for validity (Hébert, Carrier, & Bilodeau, 1988b; Hébert & Bilodeau, 1986). Inter-rater reliability showed mean Cohen's weighted Kappas of 0.75 and intraclass correlation coefficients for the total SMAF scores of 0.95 for test-retest and 0.96 for inter-rater reliability (Desrosiers, Bravo, Hébert, & Dubuc, 1995).

The **Modified CTMSP** is a modified version of the CTMSP (Classification par type en milieux de soins prolongés [Classification by type in long-term care settings]) (Tilquin & Fournier, 1985) for use in epidemiological surveys. This instrument assesses the number of hours per day of care required and actually received by a subject. Care includes nursing (skilled and unskilled), supervision and transportation for medical purposes. This instrument assesses people's needs using a two-step procedure. First, using a standardized form, the nurse collects information about health status, medication, treatments, need for diagnostic procedures or observations, respiration, nutrition, hydration, mobility, environmental adaptations, sensory problems, urinary and intestinal functions, functional autonomy, affective status and behavior, need for supervision, need for help with instrumental activities of daily living, and transportation for medical purposes. The nurse also collects information on the resources actually received by the subject. Then, using a standardized procedure, a team determines the number of hours of care per day required and provided in terms of nursing care (skilled and unskilled), support for instrumental tasks, and supervision. The number

of hours of care per day is adjusted to consider indirect activities (e.g., staff communications, chart notes), caregivers' travel time (for services at home) and the time for unproductive activities (e.g., coffee-breaks). The test-retest and inter-rater reliability coefficients of the determination of hours of care per day have been established at 0.91 and 0.95. The intra-team and inter-team reliability is also very good, with coefficients of 0.91 and 0.92 respectively (Dubuc, Desrosiers, Bravo, & Hébert, 1996).

The cost assessment includes care received (provided by formal and informal caregivers), infrastructure (building and furniture), functioning (cooking, laundry, housekeeping, etc.) and administrative support. The sources of information varied according to the living situation and type of expense (questionnaire to the subjects and to financial officers, standard costs of living obtained from Statistics Canada, and annual financial reports). In institutions, allocation methods were applied to calculate the specific part of the cost related to the different activities for the relevant subjects. The care costs were estimated by multiplying the number of hours of care received by the average salary of the caregivers (skilled or unskilled). Since the total social costs were considered, not just the public and private expenses, a replacement cost was used to establish the value of care provided by the family and volunteers (Hébert et al., 2001b).

Data processing and analysis

The different autonomy ISO-SMAF user profiles were determined using cluster analysis (Dilts et al., 1995; McLachlan, 1992) which aims to classify a large number of people into small, mutually exclusive groups in which members have the same characteristics. In light of the different recommendations expressed by several authors, a standardized procedure was followed

(Aldenderfer & Blashfield, 1984; Everitt, 1993; Punj & Stewart, 1983). As previously cited, the 29 items of the SMAF were used to develop the classification. The data were not reduced by principal components analysis since we considered it important to preserve the respective weight of each of the items of the SMAF. Moreover, they were the variables that were the simplest to use and to interpret, and this number of variables could be analyzed easily by the statistical software currently available. The sample did not contain missing data, and extreme values were not removed from the analysis since they reflected a reality we wanted to capture. Furthermore, the variables were not standardized since they had an identical scale. Several solutions were analyzed using different methods described below. Steps were carried out to examine the stability and validity of the various solutions such as a cross-validation procedure, the definition of each profile, the use of stopping rules and, finally, significance tests on independent variables which were not used for classification such as hours of care required and the cost of care received.

Specifically, the methodology illustrated in Figure 1 was applied. In accordance with the procedure recommended by Punj and Stewart (1983), the 1977 subjects were randomly divided into two sub-samples of data, D1 and D2. Sample D1 was used to form the groups and sample D2 was used for internal validation. Initially, the Ward method was used to specify the centroids necessary as starting values for the next K-means method. The similarity of subjects was measured by a distance measure called the Euclidean distance. The K-means method is a non-hierarchical approach to automated classification used when it is expected that the groups will not be nested in each other. This method passes through the data several times (iterative method) and allows relocation of subjects later in the process. Thus it can compensate for an initially poor partition, unlike the hierarchical method where it is not possible to go back to classify a subject. A cross-validation of sample D2, using a solution with constraints and another without constraints for 5

groups, was applied. The methodology was applied systematically to the solutions varying from 5 to 15 groups. The solution with constraints classifies all the cases of sample D2 based on the results of the analysis of sample D1, while no restriction is imposed with the solution without constraints. A Kappa agreement coefficient, used as an objective measurement of the stability of a solution, was then calculated between the two solutions obtained from D2. The minimum threshold of 0.61 was used as the criterion for retaining or rejecting a solution. According to Landis and Koch (1977), an agreement coefficient within the interval of 0.61-0.80 could be interpreted as *very good*. When Kappa coefficients above 0.61 were obtained, the data of samples D1 and D2 were combined and submitted to the Ward method analysis and the *k*-means iterative partition. A cluster method using the *average linkage* method was also used to verify whether the solutions obtained differed much from the preceding ones. The *k*-means method was also applied with and without the option of *running means*. When this option is used, the centroids are recalculated after each allocation, while without this option, the procedure recalculates the centroids only after passing completely through all the data. In addition, two stopping rules, which make it possible to determine the right number of groups in a sample, such as the Calinski and Harabasz criterion (C) and Marriot (V), were applied to help select a solution (Milligan & Cooper, 1985). The cross-validation procedure constituted one of the elements to be considered for the choice of the number of groups informing us as to the most stable solutions. No solution was chosen at this point in time.

[FIGURE 1-ABOUT HERE]

As a further check, external validation requires a demonstration that the casemix is useful in some broader sense. In our case, it refers to its ability to predict a patient's required hours of nursing care (Hernandez & O'Brien-Pallas, 1996). Variation in resource use between profiles was calculated by

analysis of variance with the ISO-SMAF user profile as the independant variable, and the resources required (total hours of skilled and unskilled nursing care) as the dependant variable. The extent to which the variation in total cost (care, infrastructure, functioning, administrative support) is explained by the ISO-SMAF user profile was determined by the same procedure. Also, significant differences between groups were tested with the t-test or Wilcoxon rank sum test. When conducting 2-by-2 comparisons, the alpha level was lowered using the Bonferroni method. When all the analyses were completed, a description of the ISO-SMAF user profiles of different solutions (from 5 to 15 groups) was drawn, according to the 29 items, and each group was described with regard to the hours of nursing care and assistance required per day and the cost of services per day. All these results were then given to a committee of experts with clinical experience in gerontology and research experience to determine the clinical meaningfulness of the profiles generated and validate them. This committee was made up of a geriatrics specialist, three nurses, an occupational therapist, a social worker, a statistician and a researcher in the field of administration specializing in information systems. A technique combining the Delphi method with the nominal group technique was used to allow members to choose the most satisfying solution. The analyses were carried out with the software SPSS Inc., version 8.0.

Results

The different analysis methods had a tendency to produce approximately the same types of profiles for each solution (for n=5 to 15 groups), but with a different increase in the level of autonomy. For example, the utilization of the *k*-means method with the option of running means tended to regroup the subjects into groups showing lower mean levels of autonomy, while without this option, the subjects were divided up more evenly into groups situated between the two

extremes of loss of autonomy. Moreover, the utilization of the *average linkage* favoured a 5-group solution. However, although this solution also had an excellent Kappa coefficient of 0.94 obtained from the cross-validation, it was not retained by the committee of experts because it was not useful clinically. This solution enables 5 groups of subjects to be distinguished, each group corresponding to levels of care currently found in the public LTC network, i.e. own home, foster families, pavilions, light care nursing homes (around 2-1/2 hours of care/day) and heavier care nursing homes (around 4 hours of care/day). However, although it is quite simple, it does not provide precise information about the type of services required nor about distinctions between different clienteles (for example, people in LTC facilities who have irreversible dementia and demonstrate behaviors such as searching, withdrawing, or wandering, compared to individuals who do not demonstrate cognitive problems and wish to exert their autonomy and be recognized as competent to act). Other solutions, while showing more modest statistical results, were withdrawn for the same reasons.

Examining the results of the cross-validation, three solutions with a Kappa correlation coefficient $\leq$ 0.61 were discarded because of their instability. Finally, four solutions were examined more closely by the committee and the one containing 14 profiles generated by the combination of the Ward method and the *K*-means method without the option of running means was chosen. This decision was based on many considerations such as the good Kappa coefficient (K= 0.67), the objectives of the classification, the different conditions associated with the desired system, the theoretical concept, practical judgement, clinical judgement and, finally, common sense. The 14 profiles also have a reasonable proportion of subjects in each group (5 to 12%) and are homogeneous in terms of their clinical attributes.

Figure 2 presents a diagram of the profiles which emerged from the 14 groups according to their results on the 5 dimensions of the SMAF scale: ADL, mobility, communication functions, mental functions, and IADL. While the results are synthesized in accordance with the 5 dimensions of the SMAF to facilitate presentation, the information is available for the 29 items of the SMAF. The level of functional autonomy is illustrated by a code. For the total SMAF score (/87), from the first to the last group we see an decreasing mean level of autonomy from 9.33 (s.d. = 3.58) to 73.77 (s.d.= 3.61). Each one of the 14 groups corresponds to an ISO-SMAF profile and these profiles can be grouped into five broad categories. The first illustrates the subjects with the first three profiles who show disabilities mainly in instrumental activities of daily living, in the form of difficulty (profile 1), need for supervision (profile 2) and need for help (profile 3). The first profile is made up of a greater proportion of women (81.2%) for whom the disability was demonstrated by difficulties doing certain activities such as grocery shopping and using transportation, while the second profile is made up of a higher proportion of men (54.7%) who showed significant disabilities in activities such as housekeeping and cooking. At the other extreme, in the fifth category are the subjects with profiles 13 and 14 who show the lowest level of autonomy with dependency in ADL activities. The fourteenth profile represents people near the end of their life who are no longer able to communicate and show very severe cognitive impairment. However, these people do not have behavioral problems or, if they do exist, they are minor (e.g. complaining). Between these extremes, we can observe a progression of disabilities in domestic activities and activities of daily living accompanied, for the most part, by a greater disability either in mobility functions or mental functions. These disabilities also appear gradually across the groups. Thus, the second category (profiles 4, 6, and 9) consist of people with greater disabilities in terms of mobility while their mental functions are retained. The people with the fourth profile are not dependant in ADL, profile 6 are the people who present difficulty in ADL, and the ninth profile contains subjects who need help in

both mobility and ADL. The third category includes people with predominant alterations in cognitive functions (profiles 5, 7, 8 and 10) while locomotive abilities are relatively intact. The individuals with profile 5 have moderate cognitive problems whereas profile 7 exhibits severe problems in cognitive functions with minor behavioral problems (stubbornness, whimpering, apathy). Profile 8 is characterized by people who show equivalent severe problems in cognitive functions but also require stimulation, guidance or supervision in ADL and mobility functions. The subjects with profile 10 need help with ADL, walk independently, but manifest severe problems in cognitive functions linked to major behavioral problems (wandering, aggressiveness towards self or others). Finally, the fourth category (profiles 11 and 12) includes people who exhibit substantial disabilities in mobility functions as well as mental functions. Subjects with profile 11 present occasional incontinence but maintain bowel function, contrary to those with profile 12 who are frequently or always incontinent and demonstrate major behavioral problems (wander, aggressive towards self or others). Although the SMAF score varies significantly across the fourteen groups, we observe an equivalent level of autonomy in groups 11 and 12. Moreover, subjects with profiles 11 and 12 require roughly the same total nursing care time and generate equivalent costs. However, as mentioned above, they exhibit different needs in specific aspects, namely incontinence and behavioral problems. In short, these results suggest that reasonable clinical discrimination has been achieved between the fourteen profiles.

[FIGURE 2-ABOUT HERE]

Table 1 illustrates the comparisons of total nursing care time per day and total cost per day between the fourteen groups. First, the ISO-SMAF profiles explained 82% of the variance in nursing care time. The median time required from ISO-SMAF profile 1 to ISO-SMAF profile 14

ranged respectively from 0.39 (IQR= 0.24) to 4.05 (IQR = 0.98) hours of care per day. The cost

information on each patient was used to derive a median cost for each of the fourteen ISO-SMAF

profiles when the value of the family's and volunteer's involvement was estimated by the cost paid

for the same service from a private agency. From ISO-SMAF profile 1 to 14, the median cost

ranges from $36.46 (IQR= 13.76) to $205.87 (IQR = 44.30) (1995 Canadian dollars). The

interquartile range is quite large according to the actual overlap in the clientele disability profile

between different settings (own home, intermediate facilities and nursing homes), but the cost

information is also available by setting. Overall, the fourteen profiles explain 57% of the variance in

total costs when value of the family's and volunteer's involvement is estimated by the cost paid for

the same service from a private agency.

[TABLE1-ABOUT HERE]

Discussion

This article reports the development of a clinical management system composed of 14 ISO-SMAF

profiles having significance for the clinician in LTC since a subject with a defined profile is identified

by the care provider as requiring approximately the same type of care as others with the same

profile. This is the main contribution of this study since the information is care provider-driven

before being payor-focused. In agreement with Cheah and Chee (1999), we believe that the

development of a casemix system must be based on effective clinical practice rather than purely

financial considerations. Furthermore, the instrument used to derive this casemix is easy and quick

to administer. First, at the clinical level, the nurse or other provider in any setting is able to quickly

administer the SMAF instrument (about 20 minutes). The SMAF instrument should be completed

for all elders upon admission to home care or institutions and on a scheduled basis thereafter to develop an interdisciplinary care plan for the elderly and for the distribution of care in each of the environments, which can be updated regularly. The information needed to assign patients to profiles is directly based on the completion of this tool, can be collected routinely and is easily accessible from patients' records. A computer program can then classify the resident into one of the 14 profiles by assigning the individual to the group where he/she is closest to its centroid using the Euclidean distance measure. Thus, any facility can have the ISO-SMAF user profile of its residents at its disposal without performing independent assessments.

Furthermore, in a case where the elder needs to be directed or redirected to an environment, the ISO-SMAF user profile can be compared to the ISO-SMAF resource profile which represents the package of services provided by each of the establishments in the region. In addition, since costs vary widely between different settings, the ISO-SMAF cost profile will support the definition of their admissibility criteria more precisely in order to use individual and institutional resources more efficiently. Nonetheless, the final decision regarding placement will be based on the wishes of the elders and their families and on the provider's knowledge and judgement.

At the management level, the information generated by the ISO-SMAF user profiles enables planners to explore the consequences of different mixes of services and constraints within the local context. This can be useful for the development of new resources in cases where a survey of available resources reveals gaps. It is also possible to incorporate and analyze ISO-SMAF profiles, thereby rendering them accessible for decision-making, management, planning and the evaluation process at all levels (local, area, region, province, or state).

Moreover, many strengths of this study are related to the utilization of data generated by the principal study (Hébert et al., 2001b). Analysis of these data enabled us to determine, for each ISO-SMAF user profile, not only the number of care hours per day (nursing care, assistance, support and supervision services) received, but also the required care and services which were measured simultaneously, for each living environment. This allowed us to associate the different profiles generated with the required resources according to the subjects' characteristics, not structures. Likewise, the utilization of a large stratified sample ensured that individual variations in the population of interest were well represented and accurately reflected the characteristics of the population using the services. When a casemix is being developed, many authors have pointed out the importance of obtaining a sample of the variety of existing subjects in the targeted population, from the lightest level of care to the heaviest, rather than a representative sample of this population (Dilts et al., 1995; McLachlan, 1992; Hornbrook, 1989). With a representative sample, we can designate the most frequent cases but it is difficult to define the appropriate groups for the less frequent cases.

The ISO-SMAF profile system is also the first to highlight the underlying condition of elders who require different types of care or services for the same hours of care needed per day or for the same level of disability. Thus, our results provide initial evidence of the validity and clinical utility of the ISO-SMAF system in measuring the specific resources required and used in LTC settings and show how utilization of a multidimentional measure of autonomy such as the SMAF is essential. Several authors have mentioned that the choice of variables used to form groups is the decision which has the most influence on the resulting groups (Dilts et al., 1995; Everitt, 1993). Each subject should be described by the variables which best measure the domain of interest (Hair, 1998; Aldenderfer & Blashfield, 1984). Although the 29 items of SMAF are clearly not sufficient to

describe or explain the complex area of care, they have been found sufficient to predict the nursing care requirements with acceptable accuracy ($r^2 = 84\%$) and to provide some degree of objectivity in measuring elderly people's activities (Hébert et al., 2001). These results are consistent with several studies (Carpenter et al., 1995; Turner, Main, & Carpenter, 1995; Covinsky, Justice, Rosenthal, Palmer, & Landefold, 1997) that emphasize that the activities of daily living are major factors for the variations in resources and that they make up at least the majority of iso-resources groups available at present (Fries et al., 1994; Carpenter, Turner, & Fowler, 1997; Shaughnessy, Schlenker, & Hittle, 1995; Coutton, 2000). Among the other variables which appear to be pertinent are cognitive functions. There is a substantial percentage of people affected by cognitive problems in different living environments. It ranges from 20% at home to 71% in intermediate facilities and 81% in nursing homes. If we consider the fact that the correlation between cognitive problems and the hours of nursing care and assistance per day is 0.72 and that cognitive problems constitute an increase in costs varying from 10 to 68% according to the living environment, it was judicious to use an instrument which considers these variables in the development of a casemix (Dubuc, Buteau, & Hébert, 1997).

The potential of this system is considerable. For the moment, the ISO-SMAF profile system applies specifically in contexts where there is a greater proportion of clienteles requiring LTC. This situation tends to be modified in certain LTC environments, such that we find more and more clienteles displaying equal needs for short-term care. This is why the 29 items of the SMAF could form the central core of the system to which other clientele characteristics could be added to take into account the needs for short-term care or for more specialized care. For example, we could improve the system with a certain number of nursing diagnoses in order to identify more specialized needs in nursing care or rehabilitation (Jacobson, 1996; Coenen, Marek, & Lundeen, 1996). In addition,

the ISO-SMAF user profiles first attempt to pinpoint functional deficiencies in the context of current support needs. Thus, the system is now ready for further testing in practice, such as taking into account dynamic changes in functional status. Thus the ISO-SMAF resource profiles will include not only services available to compensate for the disability, but also intervention at different levels (primary, secondary, tertiary) and by different health care staff that may be effective in delaying, preventing or reversing functional decline. Furthermore, at the present time, the quality of nursing care is not considered within this system. Although the ISO-SMAF user profiles remain a work in progress, we consider that this separate issue must be considered in the near future. With a minimal standard of quality of care, nurse executives can be best positioned to argue persuasively for needed care resources when they first have discipline-specific management data that demonstrate nursing effectiveness to contribute to multidisciplinary care planning and coordination. In addition, this information can be useful in understanding the appropriate staffing or staff mix for a facility's case mix (Harrington & al.2000).

Beyond these issues, refinement in cost information is an essential step in the further development of the ISO-SMAF system before it can be incorporated into a payment system. The ISO-SMAF cost profiles, i.e., the costs associated with each ISO-SMAF user profile, can help the different settings to understand their cost behavior and reinforce the drive for more cost-efficient services. Furthermore, a spectrum of issues needs to be addressed to select an adequate payment level and provide appropriate incentives. In fact, strong and effective quality assurance and audit systems are needed to complete the design of this payment system.

As it stands now, the system responds to the majority of LTC needs and has the advantage of providing 14 profiles based on the SMAF measure that can be easily administered and updated. It

is also the first classification to take into account simultaneously all the clienteles that can be found in the range of LTC services, whether at home, in an intermediate environment, or in an institution. This information makes it possible to go beyond the institutional barriers and observe the network as a whole rather than in regards to a single aspect. Thus, it is possible to bring together a group of services from different authorities to respond to the needs of one person rather than adapting the needs of people to existing structures. This is a strong point when talking about an integrated service delivery network.

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