

# THE INCREASING LEVEL OF CARE OF NURSING HOMES CLIENTS : MORE DEPENDENT CLIENTS OR HIGHER STANDARDS OF CARE

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## Abstract

Since 1984, Quebec uses a tool, called PLAISIR [1], for assessing the need of the clients of all its nursing homes (NH). PLAISIR allows to collect multidimensional data on NH clients, in particular, to measure the number of hours of nursing care **required** in the average per client-day. We will call this number, the **average level of care**. In this paper, we are interested in the increase in the average level of care throughout time. We measure this increase and show that it results from two phenomena : first, an increase in the dependency of the clients; second, a change in staff definition of standards of care.

## 1. INTRODUCTION

We have already described PLAISIR tool elsewhere [1][2]. Briefly, PLAISIR allows for collecting the following data : age, sex, date of admission, three main diagnoses (ICD); levels of handicap according to five dimensions of the ICIDH [3] (physical independence in A.D.L., mobility, orientation, occupation and social integration); levels of psychological and sensory impairments (twelve scales); **nursing actions** required to fill basic, relational and technical needs. For each action, one collects : its schedule and the intensity of aid required. The account of nursing actions is realized retrospectively on the last seven days. From this account, and from a weighting of nursing actions in terms of the **time required**, in the average, to perform them once (PRN system [4]), it is possible to measure the client level of care.

## 2. MEASURING THE INCREASE IN NH'S CLIENTS HEAVINESS

We are interested in the rate of increase of NH clients heaviness. To measure this rate, we use the difference between the average levels of care of NH clients in 1984-85 and 1989-90. This difference may be explained by at least two independent phenomena; first, it may reflect a change in **client's dependency** : clients are demanding more hours of care because they are more disabled; second, it may reflect a change in the way professionals define clients needs : clients appear demanding more hours of care because of an increase in **staff standards of care** : action which were not formerly regarded as required are now, or actions which were formerly regarded as required at

frequency x, are now regarded as required at frequency y, with  $y > x$ . So, if we observe, let's say, a 30 percents increase in the average level of care of NH clients over a five years period, we would like to be able to say that higher dependency of clients is responsible for example, for two thirds of that increase when higher staff standards are responsible for one third.

To do that, we use the MAC 11 dependency score which is built on two of the handicap scales of the ICIDH : dependance in A.D.L. and mobility. It has been shown [5] that Kendall correlation coefficient of the clients level of care with their score on MAC 11 eleven classes scale, was 0.77. A regression of the level of care on MAC 11 has shown that MAC 11 explained 77.7% of the level of care variance.

As said before, PLAISIR allows for collecting the score of each client on the A.D.L. and mobility scales of the ICIDH. Thus PLAISIR allows for classifying clients on MAC 11 as well as for measuring their level of care.

We make the assumption that changes in staff definition of standards of care affect only their determination of which nursing actions are required and at which frequency, and not their assessment of the clients levels of ADL and mobility handicaps, thus not clients' MAC 11 level.

Table I : Weighting of MAC 11 (hours of care per client-day)

class	1	2	3	4	5	6	7	8	9	10	11
hours	0.43	0.51	0.66	0.77	1.03	1.36	1.71	2.21	2.50	3.03	3.70

We weight each class of MAC 11 with the mean level of care of clients pertaining to this class in 84-85. This means that the levels of care in MAC 11 correspond to 84-85 standards of care (Table I). Then, we classify 89-90 clients in MAC 11 and use MAC 11 weighting (as defined above) to predict their level of care in 89-90 on the basis of 84-85 standards, which we will compare to their level of care actually observed in 89-90. The difference between observed and predicted levels of care in 89-90 is due to variations in staff's standards of care definition, while the difference between levels of care observed in 84-85 and predicted in 89-90 is explained by the increase in clients dependency.

### 3. DATA AND DESIGN

We will use the data collected with PLAISIR in 186 nursing homes from four regions of Quebec, on 16912 clients in 84-85 and on 17069 clients in 89-90. The difference of 157 clients may be explained by a small variation in the level of occupancy of these institutions. It may be shown that these nursing homes are representative of Quebec's nursing homes.

Nursing homes use PLAISIR when they want. Then, although, our data correspond to two observations in the average 4.6 years (more precisely 55.6 months) distant, for some institutions, the distance between the two observations may be as great as 72 months, and for others as small as 34 months. Nevertheless, these are exceptions and most observations (83 %) are distant from 48 to 65 months.

Of course, most clients present in the institutions at the time of the first observation were no longer there at the time of the second. We were able to match 6734 clients (40 %) from the two observations. We call this group SURVIVORS and note it SURVIVORS 1 at the time of the first observation (time 1); and SURVIVORS 2 at time 2. The others clients of the first observation were REPLACED (this is the name we give them) and we call SUBSTITUTES, those who have replaced them as observed at time 2. BLOC 1 and BLOC 2 designate the overall groups of clients respectively at times 1 and 2. Finally, NEO 1 and NEO 2

designate the groups of clients admitted in the year preceeding each observation. The size of these differents groups are the following :

SURVIVORS 1 (S1) :	6734	SURVIVORS 2 (S2) :	6734
REPLACED (R) :	10178	SUBSTITUTES (S) :	10335
BLOC 1 (B1) :	16912	BLOC 2 (B2) :	17069
NEO 1 (N1) :	3091	NEO 2 (N2) :	3437

The comparaison of SURVIVORS 1 and 2 allow to measure "in muros" increase in heaviness. The comparaison of REPLACED with SUBSTITUTES measures decrease in heaviness resulting from the replacement of very disabled by less disabled clients. The consideration of NEO 1 and NEO 2 allow to appreciate if the rate of heaviness decrease by substitution goes up or down.

#### 4. RESULTS

Table II gives the main heaviness indicators. Note that the indicator "ADL (9)" gives the percentage of clients at level 9 (the last level) of the physical independance for ADL handicap scale while "ADL (7, 8, 9)" gives the percentage of clients at level 7, 8 and 9 of the same scale. The meaning of "Mobility (9)" and "Mobility (6, 7, 8, 9)" is similar, in the case of the mobility handicap scale. Table II shows that the NH clients population is feminizing, getting older, staying longer, admitted later when one compares 1984 with 1989 data. But these are at most indirect indicators of heaviness. Let us now consider more direct indicators as hours of care per client-day on the one hand, and physical independance for ADL, and mobility handicap on the other. All indicators (except "ADL (9)") show an increase in heaviness in de clients groups B1\B2, S1\S2, R\S and N1\N2. The increase is of course the most obvious in the "in muros" group : S1\S2 for which even "ADL (9)" goes strongly up. The picture is mixed for the R\S groups where "ADL (9)" and "Mobility (9)" testify of a decrease in heaviness, the S population counting less extremely handicapped individuals then the R population. But this is true only for the extremes; when one considers together levels 7, 8 and 9 for ADL and levels 6 to 9 for Mobility, one observes an increase in S with respect to R in the percentage of these very (if not extremely) handicapped persons. This tendency is even stronger with the level of care which goes from 2.11 to 2.28 hours of care per client-day. So over this 4.6 years period, it seems that there was no decrease in heaviness by replacement.

But, as said before, the increase in the level of care may reflect not only the increase in dependency (as reflected by handicap indicators) but also changes in standards of care. To measure this last effect, we have estimated 89-90 levels of care using MAC 11 weighted on the basis of 84-85 observations. Results are presented in Table III. This table shows in all groups of clients an increase of the level of care of about 10 % (from 9.5 to 11.4 %) due to higher standards of care. For two groups R\S and N1\N2, this increase explains almost all the increase in the level of care; in the N1\N2 groups, the increase of the level of care due to the increase in clients dependency is only 3.1 % which is very small over a 4-6 years period. And in the groups R\S, one even observes a decrease of 1.4 %.

So most of the increase observed in the overall population (B1\B2) is due to the increase in the "intra muros" population : 47.4 % in 4.6 years (10.3 %/year), even if S2 represents only 40 % of B2. The increase observed in the overall population is 21.2 % (4.6 %/year) which may be splitted almost equally between increase due to higher dependency and increase due to higher standards. So, for a government willing to reflect in funding only the increase in client dependancy, the rate of increase of the budget care component should have been 2.4 % per year.

Table II :  
Main heaviness indicators for each clients group

	B1	B2	S1	S2	R	S	N1	N2
Sex (% women)	71.8	73.1	76.5	76.5	68.7	70.9	66.4	68.5
Age	78.8	79.8	75.6	80.2	80.9	79.5	77.6	78.6
Length of stay (years)	4.5	5.0	5.0	9.6	4.2	1.9	0.4	0.5
Age at admission time	74.3	74.8	70.6	70.6	76.7	77.5	77.2	78.2
Level of care (hours per day)	$\mu$ 1.89	2.29	1.56	2.30	2.11	2.28	1.93	2.21
	$\sigma$ 1.34	1.28	1.23	1.33	1.37	1.24	1.32	1.22
ADL (9)	21.9	20.2	14.8	24.4	26.6	17.4	18.3	13.3
(7, 8, 9)	70.7	81.3	62.7	80.1	76.1	82.2	73.3	80.7
Mobility (9)	29.8	34.8	20.2	37.5	36.1	33.0	28.1	29.8
(6, 7, 8, 9)	81.4	89.7	74.2	86.9	86.1	91.6	85.8	92.2

Table III :  
Decomposition of the increase in the level of care

	(1)	(2)	(3)	(4)	(5)	(6)
	Observed at t1	Estimated by MAC 11 at t2	Observed at t2	$\frac{(2)-(1)}{(1)}$	$\frac{(3)-(2)}{(1)}$	$\frac{(3)-(1)}{(1)}$
B1 --> B2	1.89	2.10	2.29	11.1 %	10.1 %	21.2 %
S1 --> S2	1.56	2.13	2.30	36.5 %	10.9 %	47.4 %
R --> S	2.11	2.08	2.28	-1.4 %	9.5 %	8.1 %
N1 --> N2	1.93	1.99	2.21	3.1 %	11.4 %	14.5 %

## 5. REFERENCES

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