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# A multi-centre European study of factors affecting the discharge destination of older people admitted to hospital: analysis of in-hospital data from the ACMEplus project

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## Abstract

**Objectives:** to examine the relationship between seven predictor variables (recorded on Day 3 of hospital admission) and discharge destination in non-elective medical patients aged 65+ years.

**Design:** prospective cohort.

**Setting:** eight centres in six European countries.

**Predictor variables:** age, gender, living alone, physical function (three categories based on Barthel Index), cognition (Katzman's orientation–memory–concentration test), main body system affected (based on International Classification of Diseases), number of geriatric giants (GGs) involved in the referral (a GG being a problem with falling, mobility, continence or cognition).

**Main outcome measures:** discharge destination (by Day 90) in three categories: 'HOMESAME' (return to previous residence), 'INSTIN90' (discharge to alternative residence or still in hospital at 90 days), 'DEADINHO' (death in hospital),

**Results:** in 1,626 patients, discharge destination was HOMESAME in 84.7%, DEADINHO in 8.9% and INSTIN90 in 6.4%. Mean duration of stay was 17.7 days, median 12. Univariate analyses showed a statistically significant relationship between all seven predictor variables and discharge destination. Physical function was the best single predictor with a seven-fold difference in adverse outcome rates between the best and worst categories. On multiple logistic regression, significant predictor variables were as follows. (i) For DEADINHO: physical function, cognition, gender; (ii) for INSTIN90: physical function, living alone, GGs, age, gender. Multiple linear regression identified physical function, GGs and living alone as predictors of log<sub>e</sub> length of stay.

**Conclusion:** case-mix systems to compare risk-adjusted hospital outcome in older medical patients need to incorporate information about physical function, cognition and presenting problems in addition to diagnosis.

**Keywords:** activities of daily living, aged, 80 and over, hospitals, outcome assessment (health care), risk-adjustment, elderly

## Introduction

Studies comparing outcomes of patients in different healthcare settings are important stimuli for improving quality of care, but for comparisons to be meaningful, adjustments need to be made based on patient risk [1]. Because of the increasing numbers of older people in the general population [2], and a rising incidence of emergency hospitalisation with age [3, 4], a methodology that allowed risk-adjustment of hospital outcomes in older patients admitted non-electively would be of particular value. Additional reasons for focusing on non-elective rather than elective admissions are that only a small proportion of older medical admissions are elective, and that the outcome of such admissions tends to be pre-determined not by individual case-mix, but by the type of procedure or investigation being performed.

Case-mix measures such as Diagnosis-Related Groups, which use discharge diagnoses and operative procedures as risk-adjusters, have limited ability to 'explain' variations in hospital outcome in older medical patients [5], probably because they fail to take into account physical and cognitive function [6]. Case-mix items collected and recorded soon after admission have the added advantage that they are not subject to subsequent complications or treatment effects [7] and that they are free from biases that might be introduced at the end of an admission when retrospective coding is being performed by a person who knows whether the outcome was favourable or not. For these reasons, the ACME<sub>plus</sub> project has been designed to produce a brief, standardised case-mix and outcome system for use in people aged ≥65 years entering hospital non-electively for medical reasons. As a first step, the present report analyses the basic statistical relationships between seven predictor variables, collected on Day 3 of the admission, and discharge destination. Subsequent publications will incorporate these risk factors into a prototype 'ACME<sub>plus</sub> instrument' which could be used to compare units admitting older medical patients.

## Methods

After ethical approval, eight centres collected data on patients aged ≥65 years, admitted non-electively to hospital for medical problems. The centres were Aberdeen, Birmingham and Sheffield (UK), Ancona (Italy), Athens (Greece), Barcelona (Spain), Bialystok (Poland) and Turku (Finland). Elective admissions, transfers from other hospitals and terminally ill patients were excluded. Mean age was 78.7 years (median 78) and 941 (57.9%) were women.

For Phase 2 of the ACME<sub>plus</sub> study, the data of which form the basis of the present report, we used a standardised questionnaire, the contents of which had been decided a few months earlier in a consensus conference of all the partners. This Phase 2 questionnaire was a shortened version of a Phase 1 questionnaire, devised at an earlier consensus conference on the basis of a systematic review [6] and previous clinical experience [8, 9]. The commonest reason for dropping an item from the questionnaire between Phase 1 and

Phase 2 was that statistical analysis at the end of Phase 1 had indicated that the item had less predictive value than other variables which were easier to collect: examples included patients' own estimation of their physical status pre- and post-admission. Other reasons for dropping items included practical difficulties encountered during Phase 1 data collection, and difficulties with consistency of data recording for some items revealed by an inter-rater reliability study. For example, it proved very difficult to quantify levels of social support, particularly as formal support systems differed greatly from country to country.

### Predictor variables

Seven main predictor variables were included in the Phase 2 dataset described. Researchers trained in health services research or nursing, or doctors in training (Athens only) collected data on Day 3 of the admission (the admission day being defined as Day 1), gathering information from the hospital notes, a health professional in the team looking after the patient, and a brief patient interview. The seven variables were as follows.

- (i) Age.
- (ii) Gender.
- (iii) Whether living alone.
- (iv) Whether any 'geriatric giant' (GG) [10] problems were judged 'to have contributed to the admission'. Individual GG items (mobility, falls, incontinence, confusion [10]) were coded simply as being present or absent, based on an examination of referral letters (if available) and the admission notes. It should be noted that it was possible for conditions such as long-standing incontinence or cognitive impairment to be present in a patient (and to be coded as such in variables (v) and (vi) below) without being part of the reason for admission.
- (v) Day 3 physical function estimated by a health professional using the Barthel Index (as modified by Collin *et al.* [11, 12]) to score 10 activities of daily living. For presentational purposes [9] we have divided the total Barthel score into three categories, 0–9, 10–15 and 16–20, low scores indicating poorer function.
- (vi) Day 3 cognition assessed by brief patient interview using the six-item orientation–memory–concentration test of Katzman *et al.* [13]. Being free of culturally sensitive items, this test is particularly useful for international studies, and was previously adopted by the European-wide EASY<sub>care</sub> project [14], which had also carried out translations. The Katzman test yields a score from 0 to 28. In the present study, scores of 0–7 were classed as normal or minimally impaired, 8–17 as moderately impaired, and 18–28 as severely impaired [13]. 'Failure to answer' was added as a fourth category.
- (vii) The 'main body system affected' on Day 3, as a broad indicator of diagnosis. Based on the experience of data collection in Phase 1 of the ACME<sub>plus</sub> project, a detailed Day 3 classification of primary and secondary diagnoses was not attempted in the Phase 2 dataset, because the diagnosis was often tentative at that stage and patients often had multiple diagnoses [15]. However,

Table 1. Association between Day 3 predictor variables and in-hospital outcome

Assessment variable	Discharge destination <sup>a</sup>							Chi-squared	d.f	P
	HOMESAME			INSTIN90		DEADINHO				
	n	n	%	n	%	n	%			
All variables	1,626	1378	84.7	104	6.4	144	8.9			
Physical function (Barthel) day 3										
0–9	371	235	63.3	48	12.9	88	23.7	214.8	4	<0.0001
10–15	435	362	83.2	41	9.4	32	7.4			
16–20	820	781	95.2	15	1.8	24	2.9			
Cognition (Katzman score) day 3										
Scores missing	181	113	62.4	20	11.4	48	26.5	132.7	6	<0.0001
18–28 (severe abnormality)	309	236	76.4	34	11.0	39	12.6			
8–17 (moderate abnormality)	416	368	88.5	26	6.3	22	5.3			
0–7	720	661	91.8	24	3.3	35	4.9			
Main body system affected, Day 3										
Not yet determined	95	70	73.7	16	16.8	9	9.5	58.1	14	<0.0001
Genitourinary	67	51	76.1	5	7.5	11	16.4			
Neurological	195	149	76.4	20	10.3	26	13.3			
Musculoskeletal	94	76	80.9	11	11.7	7	7.4			
Respiratory	266	220	82.7	20	7.5	26	9.8			
Digestive	123	106	86.2	6	4.9	11	8.9			
Cardiovascular	438	399	91.1	13	3.0	26	5.9			
Miscellaneous other	348	307	88.2	13	3.7	28	8.0			
Geriatric giant (GG) on admission										
Two or more	325	237	72.9	49	15.1	39	12.0	73.3	4	<0.0001
One	464	386	83.2	34	7.3	44	9.5			
None	837	755	90.2	21	2.5	61	7.3			
Age group										
85 and over	418	320	76.6	51	12.2	47	11.2	57.3	8	<0.0001
80–84	312	256	82.1	21	6.7	35	11.2			
75–79	353	302	85.6	23	6.5	28	7.9			
70–74	319	294	92.2	5	1.6	21	6.3			
65–69	224	206	92.0	4	1.8	15	6.3			
Living alone?										
Not applicable (group living)	92	70	76.1	7	7.6	15	16.3	39.2	4	<0.0001
Living alone	577	476	82.5	62	10.7	39	6.8			
Not living alone	957	832	86.9	35	3.7	90	9.4			
Gender										
Male	685	562	82.0	44	6.4	79	11.5	10.6	2	0.005
Female	941	816	86.7	60	6.4	65	6.9			

<sup>a</sup>HOMESAME = discharged to same residence as from which admitted, INSTIN90 = discharged to different residence or still in hospital at 90 days, DEADINHO = death in hospital.

rather than ignore diagnosis altogether [16], we coded the main body system affected, using headings from the tenth revision of the International Classification of Diseases. For presentational purposes the 21-category classification we devised has been reduced to eight categories in Table 1.

### Outcome variables

After the initial Day 3 assessment, the researcher contacted the ward at weekly intervals throughout the admission, up to a limit of 90 days. While we recorded duration of stay as a secondary outcome measure, like Challiner *et al.* [17] we used the discharge destination of the current admission as our primary outcome measure. The three categories of discharge destination (with 90 days being taken as a truncation point) were: HOMESAME (return to previous residence, including institutional care if that was the usual residence),

INSTIN90 (discharge to different residence or still in hospital at 90 days) and DEADINHO (death in hospital).

### Statistical methods

SPSS Version 12 and S-PLUS 6.1 were used. In Table 1, chi-squared analyses gave an indication of overall statistical association. In Table 2, the outcome variables of logistic regression were (i) INSTIN90 versus all other outcomes and (ii) DEADINHO versus all other outcomes. Logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs), while Pseudo-R<sup>2</sup> [18–20] gave an indication of the amount of outcome variation ‘explained’ by the predictors, with an adjustment [21] for multiple predictors. Multiple linear regression was used to identify predictors of length of stay. Where patients who had been enrolled in the study underwent active treatment in more than one unit (e.g. assessment in an admissions ward fol-

**Table 2.** Logistic regression analyses showing association between Day 3 predictors and discharge destination

Assessment variable	Dependent variable of logistic regression model:					
	INSTIN90			DEADINHO		
	A. Variables entered individually	B. All variables entered into model together	Wald, <i>P</i>	A. Variables entered individually	B. All variables entered into model together	Wald, <i>P</i>
Physical function day 3						
0–9	OR (95% CI)	OR (95% CI)	47.7 <0.001	OR (95% CI)	OR (95% CI)	107.2 <0.001
10–15	8.0 (4.4–14.4)	5.8 (2.9–11.7)		10.3 (6.4–16.5)	7.3 (4.1–13.1)	48.3 <0.001
16–20 [reference category]	5.6 (3.1–10.2)	3.3 (1.7–6.3)		2.6 (1.5–4.5)	2.6 (1.4–4.5)	
Cognition day 3	1.00	1.00		1.00	1.00	
Scores missing			26.3 <0.001			80.4 <0.001
18–28 (severe abnormality)	3.6 (1.9–6.7)	1.5 (0.7–3.2)		7.1 (4.4–11.3)	2.3 (1.3–4.1)	14.2 <0.003
8–17 (moderate abnormality)	3.6 (2.1–6.2)	1.6 (0.8–2.9)		2.8 (1.8–4.6)	1.2 (0.7–2.1)	
0–7 [reference category]	1.9 (1.1–3.4)	1.3 (0.7–2.3)		1.1 (0.6–1.9)	0.7 (0.4–1.3)	
Main body system affected	1.00	1.00		1.00	1.00	
Not yet determined			35.6 <0.001			14.5 0.044
Genitourinary	5.2 (2.4–11.3)	2.6 (1.1–6.2)		1.2 (0.5–2.6)	1.3 (0.6–3.1)	3.4 0.848
Neurological	2.1 (0.7–6.0)	1.1 (0.3–3.3)		2.2 (1.1–4.7)	1.7 (0.8–3.9)	
Musculoskeletal	2.9 (1.4–6.1)	2.1 (1.0–4.6)		1.8 (1.0–3.1)	1.1 (0.6–2.0)	
Respiratory	3.4 (1.5–7.9)	1.9 (0.7–4.7)		0.9 (0.4–2.2)	1.1 (0.4–2.8)	
Digestive	2.1 (1.0–4.3)	2.5 (1.1–5.3)		1.2 (0.7–2.2)	1.2 (0.7–2.2)	
Cardiovascular	1.3 (0.5–3.6)	1.6 (0.6–4.6)		1.1 (0.5–2.3)	1.2 (0.6–2.8)	
Miscellaneous [reference category]	0.8 (0.4–1.7)	1.0 (0.4–2.2)		0.7 (0.4–1.3)	0.9 (0.5–1.6)	
Geriatric giant (GG) on admission	1.00	1.00		1.00	1.00	
Two or more GGs			51.8 <0.001			6.7 0.036
One GG	6.9 (4.1–11.7)	3.0 (1.6–5.5)		1.7 (1.1–2.7)	0.9 (0.5–1.4)	0.8 0.679
None [reference category]	3.1 (1.8–5.4)	1.9 (1.1–3.6)		1.3 (0.9–2.0)	1.1 (0.7–1.7)	
	1.00	1.00		1.00	1.00	

Table 2. continued

[illegible]

Columns labelled (A) are based on 14 analyses with the seven predictor variables being entered one at a time against the binary outcomes of (i) INSTIN90 versus other outcomes and (ii) DEADINHO versus other outcomes. Columns labelled (B) are based on two multiple logistic regression analyses (all seven of the predictor variables entered simultaneously for outcome variables (i) and (ii)).

ORs require comparison with a reference category, and for most of the variables in Table 2, the subgroup with the ‘best’ function has been used for this. The exception is the ‘main body system’ variable where we have used the ‘miscellaneous’ category as the reference. In constructing columns (B), an alternative to performing two multiple logistic regression analyses, would have been to perform a single multinomial analysis [22] with HOME, SAME, INSTN90, and DEADINHO as the outcome categories. However, the pattern of statistical associations in a multinomial analysis proved to be similar to that shown above, as so the more familiar logistic regression with binary outcome variables has been chosen for this table.

Note that much of the predictive effect of the cognition variable arises from the 'scores missing' subgroup of patients who were often too ill and/or cognitively impaired to answer the Katzman questions.

The multiple logistic regression models containing all 7 predictor variables (see columns B) had an adjusted pseudo- $R^2$  of 0.186 when INSTIN90 was the outcome and 0.137 when DEADINHO was the outcome. Addition of an eight-category 'centre' variable increased the adjusted  $R^2$  values to 0.214 and 0.148 respectively.



lowed by rehabilitation in another), time spent in both units was added together when calculating length of stay.

## Results

Data are from 1,626 patients aged  $\geq 65$  years assessed in Phase 2 of the ACMEplus project. The most favourable discharge destination, HOMESAME, occurred in 1,378 (84.7%). The two unfavourable discharge destinations, INSTIN90 and DEADINHO, occurred in 104 (6.4%) and 144 (8.9%) respectively. Mean duration of stay (stays of  $\geq 90$  days truncated at 90 days) was 17.8 days (median 12). Patients who died in hospital had a mean/median stay of 20.0/14 days while survivors had a mean/median stay of 17.5/12 days.

### Predictor variables and discharge destination

Univariate relationships between the seven predictors and discharge destination are reported in Table 1. Chi-squared analyses were all highly significant, but with a patient sample of 1,626, small differences in outcome can produce statistical significance. Poor physical function on Day 3 was the predictor with the strongest association with adverse outcome, with a seven-fold difference in adverse outcome rates between patients in the 'best' and 'worst' physical function groups. Detailed inspection of data from Table 1 suggests that the number of GGs was a stronger predictor of INSTIN90 than it was of DEADINHO, while male gender was a better predictor of DEADINHO than it was of INSTIN90.

Table 2 looks more closely at the differences in outcome for the seven predictors by calculating ORs and CIs for, firstly, INSTIN90 versus all other outcomes and, secondly, DEADINHO versus all other outcomes. Columns labelled A are based on 14 univariate logistic regression analyses while columns labelled B are based on two multiple logistic regression analyses. Judging by the ORs, physical function was a good predictor of adverse outcome in columns A and B for both INSTIN90 and DEADINHO. Table 2 shows that ORs for a particular variable are usually smaller in column B than they are in column A. Where this discrepancy is large, it suggests that much of the apparent predictive ability of that variable arises from its association with other predictors [22]. It is rare for an OR in column B to be greater than the corresponding OR in column A, but this is seen in regard to gender and INSTIN90 with an increase from 1.0 in column A to 1.8 in column B. For some predictors (main body system, GGs, age group and living alone) the disparity in ORs between columns A and B is greatest for the DEADINHO outcome, while in the case of cognition it is greatest for INSTIN90.

The Wald statistic gives an indication of the relative importance of predictor variables, but needs to be interpreted with care [22]. Multiple logistic regression using Wald criteria identified physical function, GGs, age, living alone and gender as predictors of INSTIN90 (Table 2, first column B) while physical function, cognition and gender emerged as predictors of DEADINHO (Table 2, second column B). The addition of a 'centre' variable (reflecting the eight participating sites) to the seven-predictor model produced only a modest improvement in pseudo- $R^2$  (see legend, Table 2).

By consensus, the ACMEplus researchers adopted discharge destination rather than length of stay as the main outcome measure. However, length of stay was also recorded. When all seven predictor variables were entered together into a multiple regression model against length of stay (truncated at 90 days and logarithmically transformed), statistically significant predictors were physical function, GGs and living alone. The addition of the eight-category 'centre' variable to this model increased the adjusted  $R^2$  value substantially, from 0.121 to 0.184.

## Discussion

We aimed to identify those clinical risk factors, collected soon after hospital admission, which were most strongly correlated with discharge destination in non-elective medical patients aged  $\geq 65$  years. How do our findings compare with those of past studies? To allow easy comparison, Table 3 gives a broad summary of the findings of our earlier systematic review [6]. It indicates that, as in the present study, physical function and cognition were the predictors most often correlated with mortality, discharge destination and length of stay in past studies. While diagnosis and/or presenting problems were less consistently correlated with discharge destination and length of stay in previous studies, our own data suggests that the number of GG problems might have a role in predicting length of stay, but further work on the reliability and predictive ability of the individual GG items is required. In past studies and the present study, age had a moderate association with discharge destination, a minor association with length of stay, but little association with hospital mortality. Gender was not a consistent predictor of outcome in Table 3, but male sex emerged as an adverse factor in our multivariate analyses in Table 2. The systematic review [6] was completed in 2000 at the onset of the ACMEplus study, but a subsequent study in rehabilitation patients has also identified physical function and cognition as the best predictors of discharge destination [17].

Is the statistical association we found between our seven predictor variables and discharge destination strong enough to warrant the inclusion of these variables in a

**Table 3.** Summary of statistical relationships reported in 14 previous studies of risk factors and hospital outcome in patients age 60 years or over (based on data contained in systematic review of Campbell *et al.* [6])

Risk factor domain	Outcome measure		
	Mortality	Discharge destination	Length of stay
Physical function	+++	+++	+++
Cognitive function	++	+++	+++
Diagnosis/presentation	++	++	++
Age	–	++	+
Gender	+	–	+

+++ statistically significant relationship found in  $>2/3$  of the analyses.

++ statistically significant relationship found in  $1/3$  to  $2/3$  of the analyses.

+ statistically significant relationship found in  $<1/3$  of the analyses.

– statistically significant relationship found in none of the analyses.

prototype case-mix measure? While the levels of pseudo- $R^2$  attained in our logistic regression models will appear modest to those more familiar with using  $R^2$  in linear regression, well-fitting logistic (as opposed to linear) regression models may have  $R^2$  values as low as 0.1 [23–25], and our  $R^2$  values are comparable with those quoted for ‘severity-of-illness’ risk-adjusters in hip fracture [26] and high-risk medical patients [27].

How much of the inter-centre variation in outcome was ‘explained’ by our predictor variables? When discharge destination was taken as the outcome variable, the improvement in  $R^2$  when the ‘centre’ variable was added to models was small (adjusted  $R^2$  value increasing by about a thirteenth for DEADINHO and a seventh for INSTIN90). This suggests a potentially useful role for the seven predictors as risk-adjusters when discharge destination is the outcome of interest in different units. However, in the case of length of stay, the addition of ‘centre’ to a model containing three predictors (physical function, GGs and living alone) increased the adjusted  $R^2$  by over 50%, indicating that much of the inter-centre variation in length of stay was not being captured by the other variables.

Did we collect our predictor variables at the optimum time? To identify risk-adjustment factors that are relatively free from the confounding effects of treatment, data collection should occur soon after admission [7]. Our choice of Day 3 as the best time to collect predictor variables was in line with earlier studies [6], having the advantage of being early in the admission, while avoiding episodes of acute clinical instability which occurred soon after arrival. This means that patients who died or were discharged prior to Day 3 were not included in our dataset. However, this is not to say that prognostic systems based on patient status during the first few hours of admission are unimportant, and we would envisage our Day 3 assessments being complementary to, rather than in competition with, such systems [15, 24, 25, 28, 29].

How long would it take to collect the seven items in day-to-day clinical practice? The answer to this question depends on the quality of medical records, and the type of data routinely collected. Face-to-face contact with the patient to collect the six Katzman items usually takes less than 5 minutes, with 5 minutes being required to gather Barthel data from a member of staff and 5–10 minutes to retrieve the other data items from the notes.

A limitation of our study was the use of a simple diagnostic classification based on the main body system affected, and we will evaluate the feasibility of an expanded Day 3 diagnostic classification in the future. However, the eight-category classification presented in Tables 1 and 2 performed as well as the 21- 17- and 14-category alternatives we explored.

What are the policy implications of our study? Firstly, guidelines usually advocate prompt specialist evaluation of older hospital patients, especially when there is a high risk of institutionalisation [30]. Our results confirm that, in older medical patients, physical function, cognition, living alone and the presence of GGs are stronger predictors of institutionalisation than age, and suggest that these variables should be incorporated into any needs-based system of referral. Secondly, prospective payment based on diagnostic

groups is increasingly being used to commission acute hospital services within Europe. If the aim is to predict hospital outcome in older medical patients, it would be wise to incorporate information about physical function, cognition and GGs in addition. Thirdly, when hospital-related death rates of older people are used as outcome measures in audits, adjustment should be made for physical and cognitive function.

## Conclusions

When discharge destination is the outcome of interest in older people admitted urgently to hospital with medical problems, a brief assessment on Day 3, using a small number of data items, should be useful as the basis of a system for risk-adjusted outcome. Day 3 functional status is likely to be more important in this respect than a Day 3 diagnostic classification. Our study has also indicated that presenting problems of the GG type should receive more attention in the future. Subsequent publications will combine the main Day 3 risk predictors into an ‘ACMEplus instrument’ which could be used by healthcare workers to compare their results with those of colleagues elsewhere, probably in the form of periodic audits.

## Key points

- Previous research has shown that case-mix systems based on diagnostic data recorded at the end of a hospital admission have limited ability to explain variations in hospital outcome in older patients admitted with medical problems.
- If the aim is to produce risk-adjusted outcomes that can be used as a stimulus for improving quality of care, earlier work suggests that data should be collected soon after admission and that measures of physical and cognitive function should be incorporated.
- In the present study, the importance of physical and cognitive function on Day 3 in predicting discharge destination has been quantified through a prospective European-wide project that is much larger in size and scope than earlier studies.
- Diagnosis was less important than physical or mental function in determining outcome, but the data suggested that the predictive ability of presenting problems of the GG type needs to be further explored.
- The study shows the potential for a small set of clinical variables, collected on Day 3 of a non-elective medical admission, to be used as the basis for a case-mix system for comparing risk-adjusted outcomes in older hospital patients.

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## Conflicts of interest

None.

## Contributors

In addition to the named authors, the ACMEplus project team consists of: Cari Almazan, Sergio Arino, Cristian Balducci, Ahmed Abdel Hafiz, Anna Hernandez-Cortes, Janusz Lewko, Maria Gabriella Melchiorre, Montse Moharra, Francesca Polverini, Costis Prouskas, Ramon Pujol, Sabrina Quattrini, Tapio Rajala and Judy Triantafillou.

All authors and other named members of the ACMEplus Project Team were involved in the Consensus conferences that determined the direction of the project and the choice of variables to be retained in the final questionnaire. All also had input to the publication and approved its final form. Non-UK members of the ACMEplus Project Team performed translation and back-translation of questionnaires where required. D.G.S. designed the study. S.E.C. drafted the paper, and D.G.S. led the revision of the paper assisted principally by S.E.C., W.R.P., M.E. and I.P. Data analysis was undertaken by S.E.C., D.G.S. and J.L. with guidance from DNS Ltd.

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# Sexuality in older adults: behaviours and preferences

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## Abstract

**Background:** while much has been written about adult sexuality, relatively little is available about the sexuality of older people. Available literature often does not discuss specific sexual behaviours and includes predominantly married, better-educated, mostly young old.

**Objective:** the purpose of this study was to assess a sample of lower-income older adults, about whom there is limited information, to describe a full range of sexual behaviours and to identify the degree to which they are satisfied with their sexual activities.

**Methods:** subjects were 179 people (60 and older) who were residents of subsidised independent-living facilities, recruited during a lecture or in public areas in the building. Thirteen of 179 were excluded due to age. Most were white (82%), living alone (83%) and female (63%).

**Results:** overall, the majority reported to have had physical and sexual experiences in the past year such as touching/holding hands (60.5%), embracing/hugging (61.7%) and kissing (57%) daily to at least once a month; mutual stroking, masturbation and intercourse were experienced 'not at all' by 82% or more. For all activities except masturbation, participants wanted to participate in sexual activities more often than they did. The most important barrier to sexual activity was lack of a partner. Self-reported health was related to sexual activities wanted, with age also related to some preferences.

**Conclusions:** most of the elderly surveyed want to maintain a sexual relationship which includes touching and kissing, and they would like to have more sexual experiences than they have accessible. Further studies are needed.

**Keywords:** aged, sexual behaviour, sex factors, ageing, elderly

## Introduction

While much has been written about adolescent and adult sexuality, relatively little is available that highlights the nature of sexuality in older age groups. Sexuality may include touching, caressing, fantasy, masturbation, physical closeness and the warmth generated by emotionality [1].

The effect of the ageing process on sexuality and sexual function depends upon the mental and physical health status of an individual [1].

Studies have shown that the frequency of intimacy and intercourse declines with age; however, satisfaction with sexuality may not be affected [2]. Normal physiological changes such as decreased vaginal secretions and flattening