

ANALYZING CLIENT CHARACTERISTICS AND NEEDS IN HOME HEALTH CARE

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ABSTRACT

Purpose

The purpose of this study is to describe characteristics of the home health care population, including their needs for care, and the amount of care delivered.

Design

A quantitative retrospective analysis of electronic client records was performed. Data of 77,129 clients originated from a large nationally operating Dutch home health care organization (Buurtzorg). Clients lived throughout the country in both rural and urban locations. Data was collected from January 2008 until March 2015 by nurses and nurse assistants working in over 800 community based self-managing teams.

Methods

Electronic data was captured in point of care situations and was entered on a day to day basis by professionals, providing care to the clients. Items analyzed concerned age, gender, living unit, client type, client problem, nursing diagnosis, and signs and symptoms (as documented with the Omaha System), number and duration of care episodes, amount of time spent and number of visits.

Conclusions

Five actual problems that were documented most frequently for all clients were personal care, skin, medication regimen, circulation and neuro-musculo-skeletal function. There is a large between-client variation in the amount of care needed and the means are highly influenced by outliers. Sixteen relevant client profiles, based on six client types (frail elderly, dementing elderly, hospital discharged, palliative care clients, chronically ill clients and other) could be defined. The amount of care is highly dependent upon these client profiles. Categorization by these client profiles seems to be distinctive and relevant when analyzing needs in home health care, because the outcomes related to the amount of care differ per profile. Homogenous subsets of client profiles for each outcome could be defined. The most care intensive clients can be found in the profiles of dementing elderly and palliative care clients. Dementing elderly have the longest duration of care episode and the highest total number of hours of care. Palliative care clients need the highest number of hours of care per week and highest number of visits per week. The least care intensive clients can be found in the groups 'other' and 'discharged from hospital'. The prevalence of relevant client profiles is very different for the population that still receives care compared to the population with completed care episodes. Both groups have to be analyzed in order to provide reliable information about the population served.

Keywords

Home health care, community based care, self-managing teams, patient classification, nursing diagnosis, client characteristics, client needs, utilization of resources, Omaha System

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1 INTRODUCTION

Home health care is among the most common types of care delivered for a wide range of clients. Clients from all ages and with all sorts of conditions or problems need this type of care, which can range from care for physiological or psychosocial problems, to problems related to the client's environment. Examples of problem areas are respiration, bowel function, mental health, income or residence. The number of people in need for home health care is considerable and will rise. The ageing of the population is often mentioned as the main driver, but other factors need to be considered as well, which is highlighted in Figure 1.

FIGURE 1 NEED FOR HOME CARE (SOURCE: HOME CARE IN EUROPE. THE SOLID FACTS (WHO REGIONAL OFFICE FOR EUROPE, 2008))



In the Netherlands, over the past decade, every year around 3% of the Dutch adult population, received reimbursed home health care (CBS, 2015). This number (approximately 500,000 clients) includes clients receiving skilled nursing care, such as administering of medication or providing wound care, and it includes help with activities of daily living, such as bathing and getting dressed. Domestic services are not included in this number. The services reimbursed nationally amounted to € 3,1 billion

in 2013. In Europe, public spending on home care accounted for more than 30% of the resources spent on long-term care in many OECD countries, ranging from 0.2% of gross domestic product in Spain to 2.75% in Sweden (WHO Regional Office for Europe, 2008).

Data and knowledge about the population served, as well as the services needed and delivered are necessary in order to identify the best and most cost effective practices. The generation of these data in home health care, however, has its challenges. Home health care delivery is often driven by regulations and reimbursement rather than clinical reasoning or incentives. For example, what and how is being reimbursed, determines how care delivery is organised, and how much and what type of care is being delivered. In the Netherlands, this has led to fragmented home health care delivery, an increased use of lower educated staff and staff with a strict time limit. This affects what happens in actual practice and what is documented about the client situation and the services provided. With little time to document or fragmented knowledge of the client situation, documentation is likely to be compromised. Apart from this, data collection in home health care in itself is a challenge. One of the most reliable sources should be client records. In the Netherlands, these are often still paper based and contain free text. Where electronic records are used, free text is also abundant, rather than the use of standardised health terminology and predefined items. This affects data quality and options for analyses. Other issues are that data is often collected periodically in ICT systems other than the main electronic health record or by others than the professional delivering daily care to the client. From a nurse / client perspective however, health data from point of care situations collected on a day to day basis by the actual caregiver are indispensable.

The only way to provide quality information about home health care is to find datasources that are less affected by the issues above. This source was found in databases from a large national home care organisation 'Buurtzorg', serving around 30.000 clients each year (Gray, 2015; Huijbers, 2011 / 2015; Laloux & Wilber, 2014; Nandram, 2015; Schulmann & Leischenring, 2014). The organisation employs over 9000 nurses and nurse-assistants working in self-managing community based teams of 8-12 professionals without team managers. Nurses and nurse-assistants accept clients, plan workload and divide tasks as they see fit. Nurses may also provide personal care for example. Teams are free to deliver the type and amount of care needed, from a company vision of striving for care-independency of clients where possible. The company has used IT from its start in 2006 to simplify tasks, lessen bureaucracy, improve efficiency and to communicate.

Teams are also free to combine home health care tasks with district nursing, community nursing and public health tasks. It may be assumed that with this broad scope and practice, analysis of a client's situation is comprehensive and holistic and data about care delivery provides valuable information about the client population and need for care.

All frontline staff are responsible for nearly all data-entering about their clients into electronic health records. The company chose to professionalise the health records using standardised health terminology and a classification system: the Omaha System (Martin, 2005; Topaz, Golfenshtein, & Bowles, 2014). The Omaha System was integrated in the software to support daily nursing practice, professionalize documentation and enable knowledge discovery.

1.1 Client characteristics and client needs

Analyzing clients' characteristics and their need for care is possible in many ways. In this study the focus will be on two main components:

- characteristics of the client: demographics, client types, actual problems and signs and symptoms
- the amount of professional care actually delivered

Both components may vary in time. For example, a client situation can be characterized by many things at start of care and may improve with time resulting in less care delivered, and vice versa. Situations may also be stable in time with little change.

The health related characteristics that were analyzed in this study ranged from general to more specific. Six client types, such as 'palliative care client' and 'dementing elderly' represent the most general level. Forty-two problem areas that can affect a client's wellbeing, such as circulation and medication, are considered to be of the intermediate level. The third and most specific level consists of signs and symptoms further specifying these problem areas, such as 'edema' and 'inadequate system for taking medication'.

In order to describe the population sample on the amount of care delivered, care episodes, the hours of care and the number of visits were analyzed.

Categorizing by client types

When describing a population sample, items on which to categorize should be relevant for that population. If we were for example to describe all problem areas and amount of care spent for females versus males, it would not create a useful picture, because the home health care population is not defined by gender. In home health care many different categorizations are possible, such as long term care clients versus short term care clients, or a categorization by disease. This first option would be rather general, while the latter option would be extremely complex with hundreds of possible diseases, and combinations of diseases to analyze.

The home health care organization whose data are analyzed, chose to categorize clients in the electronic health records by client types that were considered common in home care:

- chronically ill clients
- frail elderly
- dementing elderly
- hospital discharged
- palliative care clients
- other

In this study this categorization by client types, and their combinations, will be used as a basis for analyses and comparing groups. These combinations will further be described as 'client profiles'.

Client profiles are unique mutually exclusive groups of clients based on their single or combined client type characteristic (-s).

Research Questions

The following research questions will be answered in this study:

1. What are the client demographics?
2. What is the prevalence of client types, problems and signs and symptoms?
3. What are relevant client profiles based on client types?
4. What is the amount of care delivered in terms of care episodes, time spent and number of visits?
5. Do client profiles differ significantly in the amount of care delivered?
6. Can homogenous subsets of clients with regard to the amount of care delivered be defined?

2 BACKGROUND

Several studies have addressed the subject of client characteristics and the need for care. Some focus on the relationship between characteristics (Glick, 1994; Helberg, 1993). Some studies focus on patients problems and time related outcomes (Brooten, Youngblut, Deatrick, Naylor, & York, 2003; Helberg, 1994; Marek, 1996; Payne, Thomas, Fitzpatrick, Abdel-Rahman, & Kayne, 1998). Other studies address client related predictors of nursing workload or use of services in a broader sense (Campbell, Taylor, Callaghan, & Shuldham, 1997; Cox, Wood, Montgomery, & Smith, 1990; Hammar, Rissanen, & Perala, 2008; Lee & Mills, 2000a; Morales-Asencio et al., 2009; Trisolini, Thomas, Cashman, & Payne, 1994). Studies do not always mention how data on characteristics were gathered. Some of these studies mention the use of standardized terminologies and classifications developed to name and classify concepts which can serve as characteristics. Other studies mention how certain events or facts are used to derive characteristics from. For example a client who receives a certain type of medication is then characterized or categorized as 'chronically ill'. Terms differ in the area of client categorization. Synonyms are for example segmentation, differentiation and profiling. The purposes differ as well. Frontline staff may simply use it in daily practice but there are also models to 'calculate' categories of clients for billing or reimbursement purposes. Examples are per capita payments, lump sum funding for certain groups of patients, or risk equalization methods, used to financially compensate for clients who need a lot of care or have high healthcare costs for other reasons.

2.1 Categorization by disease

Patient categorization by diseases has proven to be extremely complex with hundreds of possible diseases, and combinations of diseases to analyze. Alternatives such as Adjusted Clinical Groups to measuring multi morbidity have been developed, which characterize illnesses by their type and combinations of types over time (Starfield & Kinder, 2011; Weiner, Starfield, Steinwachs, & Mumford, 1991). Other studies also address these challenges and the many options around measuring and evaluating multi morbidity (de Groot, Beckerman, Lankhorst, & Bouter, 2003; Gijzen et al., 2001; Marengoni et al., 2011; Prados-Torres, Calderón-Larrañaga, Hanco-Saavedra, Poblador-Plou, & van den Akker, 2014; van den Akker, Buntinx, Metsemakers, Roos, & Knottnerus, 1998).

2.2 Patient classification and case-mix groupings

Most of the studies on predictors of use of resources are written in the light of cost control mechanisms: predicting nurse workload and staffing and prospective payment systems. This is when patient classification and case-mix groupings are used, such as Resource Utilization Groups for Home Care or Home Health Resource Groups and where instruments like OASIS are mentioned (Bjorkgren, Fries, & Shugarman, 2000; Choi, Jenkins, Cimino, White, & Bakken, 2005; Livesay, Hanson, Anderson, & Oelschlaeger, 2003). Even though some studies were carried out 25 years ago, the concerns around gathering health related data for payment systems are still relevant today. Certain findings suggest that those variables traditionally relied on for reimbursement qualification and as

components of patient-classification schemes may not be wholly adequate to explain resource use and patient outcome in the home health setting (Cox et al., 1990; Helberg, 1990). There are also concerns around validity and reliability of classification systems that were developed without using certain research methodologies (Williams & Crouch, 2006). These patient classifications are meant to predict the type and intensity of services needed, often from a cost control perspective. Terminology standards, as used in this study, aim no such thing.

2.3 Standardized nursing terminology

Standardized terminology or minimum datasets are necessary to assess and document client characteristics in a structured and standardized way. In nursing, different standards exist and can support both daily practice and research if used in electronic health records (ANA, 2008; Westra, Delaney, Konicek, & Keenan, 2008). The purpose is to support practice in naming, documenting and communicating clearly and to enable proper information management. Coded standardized nursing terminologies have proven great potential because they can be automated in any electronic health record and allow documentation of problems, interventions and outcomes in coded terms using validated comprehensive sets not limited to certain client types or conditions. They also have the proven potential of integrating standardized care plans into electronic health records (Monsen et al., 2011). The number of standardized nursing terminology publications increased primarily since 2000 (Tastan et al., 2014). Both small and large scale research using electronic health records based on terminologies have identified the prevalence of client characteristics (Juve-Udina, 2013; Lee & Mills, 2000b; Tastan et al., 2014; Westra et al., 2008).

2.4 Other findings

None of the studies mentioned above combined client characteristics, documented with nursing terminologies used to support professionals in their daily work, with multiple time related outcomes using a large population sample in home health care. None of the sites or organizations studied seemed to deliver care from a philosophy and type of organization comparable to Buurtzorg.

3 METHODS

3.1 Client characteristics

The electronic health records of Buurtzorg allowed documentation of many different kinds of client data, client characteristics being one of them. Four different groups were distinguished ranging from general to more specific:

- client demographics: age, gender, living unit (alone, with partner, with children, etc.)
- client types: chronically ill clients, dementing elderly, frail elderly, hospital discharged, palliative care clients, other
- client's problem areas and nursing diagnoses
- signs and symptoms indicating and specifying the actual problems

3.1.1 Client demographics

Age was calculated as the age the client had on first date of care delivered. Living unit is also referred to as residential status in other publications. This status is documented when a client starts an episode of care, but may change during a care episode. However, the living unit at time of reference date (see glossary) was the status that was analyzed. All clients with the status 'lives in a care facility' were excluded from the study.

3.1.2 Client types

A client can have one or more client type characteristics during one or more episodes of care. Due to the fact that the software did not provide these options until late 2010, not all records were completed with these characteristics. Since the focus of this study is categorization by client types, all clients with missing data on client type were excluded. This resulted in a sample of 77,129 records.

The most general level of characteristics, or 'client types', that health professionals could select were: chronically ill clients, frail elderly, dementing elderly, hospital discharged, palliative care clients and (as of November 2014) 'other'. Selection of these types was done based on client information and assessment. For ease of reading, types are abbreviated in tables with letters as shown in Table 1.

TABLE 1 CLIENT TYPES

Letter	Client type name
c	chronically ill clients
d	dementing elderly
f	frail elderly
h	hospital discharged
p	palliative care clients
o	other

Since a client can have one or more client type characteristics during one or more episodes of care, combinations are possible. All occurring combinations (profiles) were analyzed and 56 profiles were found. A profile can be 'palliative care client' only, or a combination. All profiles that occurred in less than 1% of cases were considered rare and analyzed as one 'rest' group (represented in further figures and tables as 'R').

3.1.3 Client's problem areas and nursing diagnoses

All possible 42 'Problems' of the Omaha System were available for documentation. Problems in the Omaha System are defined as "Unique client concerns, needs, strengths, issues, foci, or conditions that may affect any aspect of the client's wellbeing; nursing diagnoses stated from the client's perspective" (Martin, 2005). These areas could be marked as 'actual', 'potential', or 'health promotion' (see glossary for definitions). Only 'actual problems' were analyzed in this study. Table 16 in Appendix A (p.59) shows a complete list of all 42 Problems.

3.1.4 Client's signs and symptoms

In the Omaha System structure, the client Problem status 'actual' is characterized by the existence of one or more signs or symptoms indicating a deficit or impairment in this problem area. Each actual problem can be specified using a unique set of signs and symptoms. For all 42 problems together, a total of 376 signs and symptoms are available in the Omaha System and were available in the software. Table 17 and Table 18 in Appendix B (p.61) show all relevant signs and symptoms.

3.2 The amount of professional care

The amount of care delivered was measured with the following outcomes:

- number and duration of **care episodes**
- **time spent**
 - total hours spent
 - hours of care per week
- **number of visits**
 - total number of visits
 - number of visits per week

The services under study include skilled nursing care, medical social services such as counselling or help finding resources in the community, and help with social and emotional concerns related to illness. They also include help with daily living activities or home use of medical supplies or equipment. Hours spent on tasks that were not client specific were not included. Examples are work in the community or general meetings with general practitioners or local city councils.

3.2.1 Clients currently in care vs. clients with completed care episodes

When analyzing time related outcomes, a distinction has to be made between clients who still received care at the reference date (see glossary) and clients who had completed episodes. This has two reasons. Firstly, total duration of a care episode, total number of visits and total hours of time spent can only be calculated validly for clients who have completed care episodes. Table 2 (p.18) presents an overview of the outcomes of interest. The overview includes the number of clients for whom these outcomes could be calculated. Secondly, clients who need long term care may not 'finish' an episode of care and could very well receive care for several years. These clients form a specific group, which must be included in the analysis. Not making a distinction between clients still receiving care versus clients having a completed care episode would paint an incorrect picture of the prevalence of client types. For example, groups of clients who receive short term care will be more prevalent in the group with completed episodes. A total of 56,750 clients had completed episodes only, while 20,379 clients received care at the reference date. These will further be referred to as 'currently in care'.

3.2.2 Care episodes

A care episode was defined as starting with any care delivered with a minimum of 5 minutes, could last any number of days, and ended when during 30 days no further care was provided. If after 30 days another unit of 5 minutes or more of care was registered, it was counted as a new episode. All outcomes, except number of care episodes, were calculated for clients who had had one episode of care only (N=61,270). Total duration of care episode was calculated for clients with one episode only and who had completed that episode. Table 2 (p.18) presents an overview of the outcomes of interest.

3.2.3 Number of hours of care and number of visits

Number of hours of care consisted of all hours registered in the electronic health record. The minimum of time registration is 5 minutes.

A distinction was made between minutes of care that were registered by frontline staff and the final minutes of care for the client that were billed. The majority of minutes were registered by frontline staff, treating clients. Billed minutes are what is eventually billed for reimbursement after checks by administrative staff. Differences may occur between initially registered minutes by frontline staff and eventual minutes billed. If more time was registered than billed, the reimbursement rules are usually the cause, impeding full billing of time spent. If more hours were billed than registered by frontline staff, the extra hours were mostly delivered by third parties. In case more time was registered than billed, the registered hours were used for the analyses. In case more hours were billed than registered, the billed hours were used for the analyses.

The total number of hours of care, including hours delivered by third parties, were calculated for clients with only one care episode and who had completed that episode (see Table 2). A mean number of hours of care per week was calculated as the sum of hours of care, divided by the duration of the episode, whether it was completed or not.

The number of visits were counted as the number of times that minutes were registered in the client record. In this report this was translated into visits. Technically speaking, a professional could also

register client time not spent at the client's home, but elsewhere. This could be for consultation with colleagues or a general practitioner.

Total number of visits and mean number of visits per week could only be calculated for clients who had not received any care from third parties, because third party hours were not specified by number of visits. So for these clients, the true number of visits could not be calculated.

TABLE 2 SELECTED CASES AND CASES NOT CALCULATED

	I.	II.	III.	IV.	VI.	VII.	Valid (N)
Total number of care episodes	✓	✓	✓	✓	✓	✓	77,129 (100%)
Total duration of care episode	✗	✓	✓	✗	✓	✓	46,304 (60%)
Total number of hours of care	✗	✓	✓	✗	✓	✓	46,304 (60%)
Mean number of hours of care per week	✓	✓	✓	✗	✓	✓	61,270 (79,4%)
Total number of visits	✗	✓	✓	✗	✓	✗	35,771 (46,4%)
Mean number of visits per week	✓	✓	✓	✗	✓	✗	50,121 (65%)

I. IN CARE

II. COMPLETED CARE EPISODES

III. ONE CARE EPISODE ONLY

IV: MORE CARE EPISODES VI:

EXCLUDING 3RD PARTY VII:

INCLUDING 3RD PARTY

N = NUMBER OF CASES / CLIENTS

3.3 Sample & sampling method

Data were extracted from electronic health records. All clients served by Buurtzorg are registered in one software application (Ecare Services, 2013). Data were queried using Microsoft SQL Server 2012, and imported in IBM SPSS 22. No other filtering was done prior to export. Clients had given consent to use their anonymized data for reporting.

Client records were analyzed after the following exclusion criteria:

1. Clients served by non-regular teams (e.g. teams delivering care in hospice facilities, teams providing social care and counselling only, teams delivering domestic services, or 'project teams' financed through special project funding).
2. Clients with non-regular financing (e.g. privately paid, short term advice, hospital at home skilled nursing care, or otherwise reimbursed care).
3. Clients with missing data on one or more of the following items: birthdate, gender, data on minutes of time registered, client type (e.g. dementing elderly, frail elderly, other, etc.).

This resulted in a dataset of 77,129 clients.

The dataset was generated on 04-04-2015. A reference date of 01-03-2015 was used however, because some data, for example on time spent, is registered at a later time than on the actual date of care. This way, the data collected could be viewed as 'as complete as possible'. This means that any data on time actually spent and documented after this date was not included in analyses. The first date of care delivered for clients included in the study was 01-01-2008 (start date of current software).

3.4 Statistical analyses

All statistical analyses were performed using IBM SPSS 22. Several types of analyses were conducted.

- Descriptive statistics were used to analyze prevalence of characteristics.
- Log transformation was used for time- and visit-related outcomes because of highly skewed distributions, to reduce the impact of extreme outliers. All data were subsequently visually inspected and showed more closely to normal distributions.
- In situations where means were not an accurate representation of the data because of highly skewed distributions and relatively large standard deviations (SD), tables show the median (50%) and the interquartile range (IQR) for 25% and 75%, as well as the 95th percentile, as more accurate representation of the data.
- Analysis of variance (ANOVA) of log transformed data was done to test for significant differences between groups. This was performed on all continuous variables related to time and number of visits. In case of heterogeneity of variances the Welch test was performed.
- Post hoc tests were done to make pairwise comparisons between all different client profiles. Games-Howell post hoc test was chosen because of best performance with unequal sample sizes and unequal variances (Field, 2005). Homogenous subsets were defined. A subset was created by one or more profiles of which the log transformed means were found not to be statistically different from others. All means from log transformed data in the tables were replaced by the median of the profile, because log transformed data are not informative as to absolute values for the reader. Therefore the medians that are listed under each subset comprise a set of medians, of which in the same profile, the log transformed means are not significantly different from each other.
- Groups with categorical variables were compared using Chi-squared tests.

4 RESULTS

4.1 Client demographics of the population sample

Client demographics that were analyzed were age, gender and living unit. The mean age was 74.3 (SD 13) years. The minimum was 0 and the maximum 107 years of age (Figure 2).

The female / male ratio was 45,405 / 31,726 (58.9% / 41.1%).

The majority of clients lived with a partner only (46%) or lived alone (45%)(Figure 3).

FIGURE 2 AGE

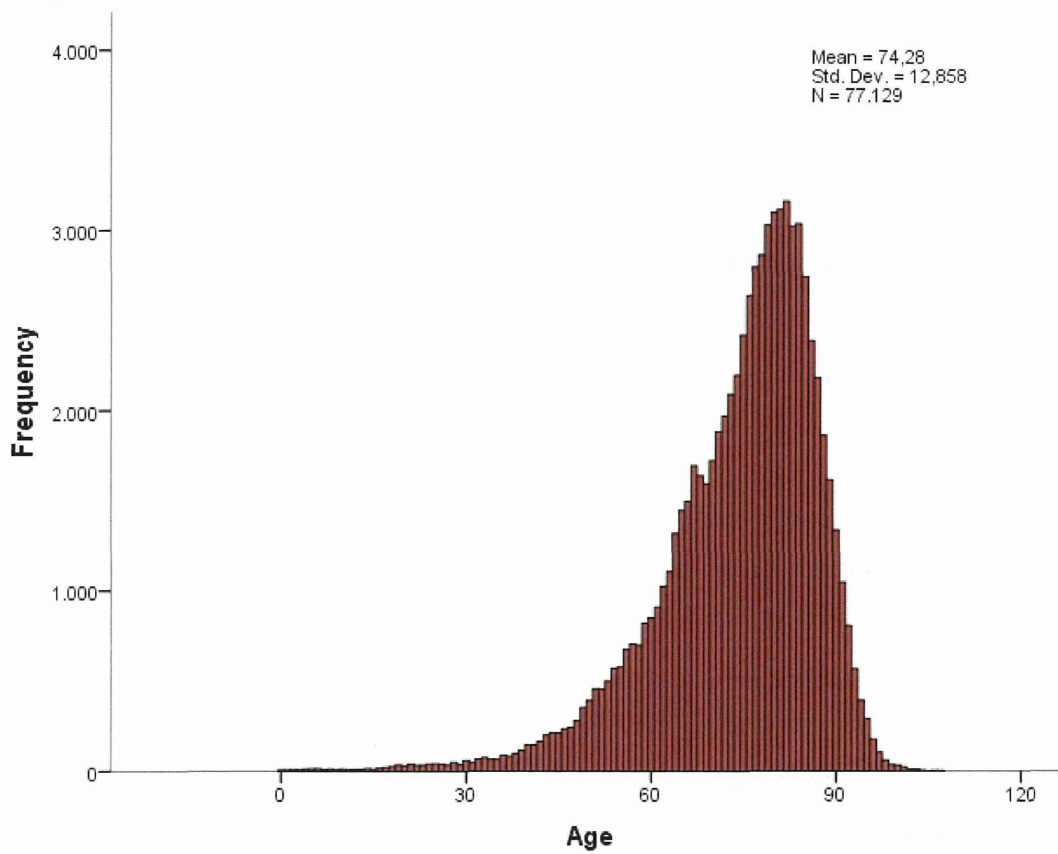
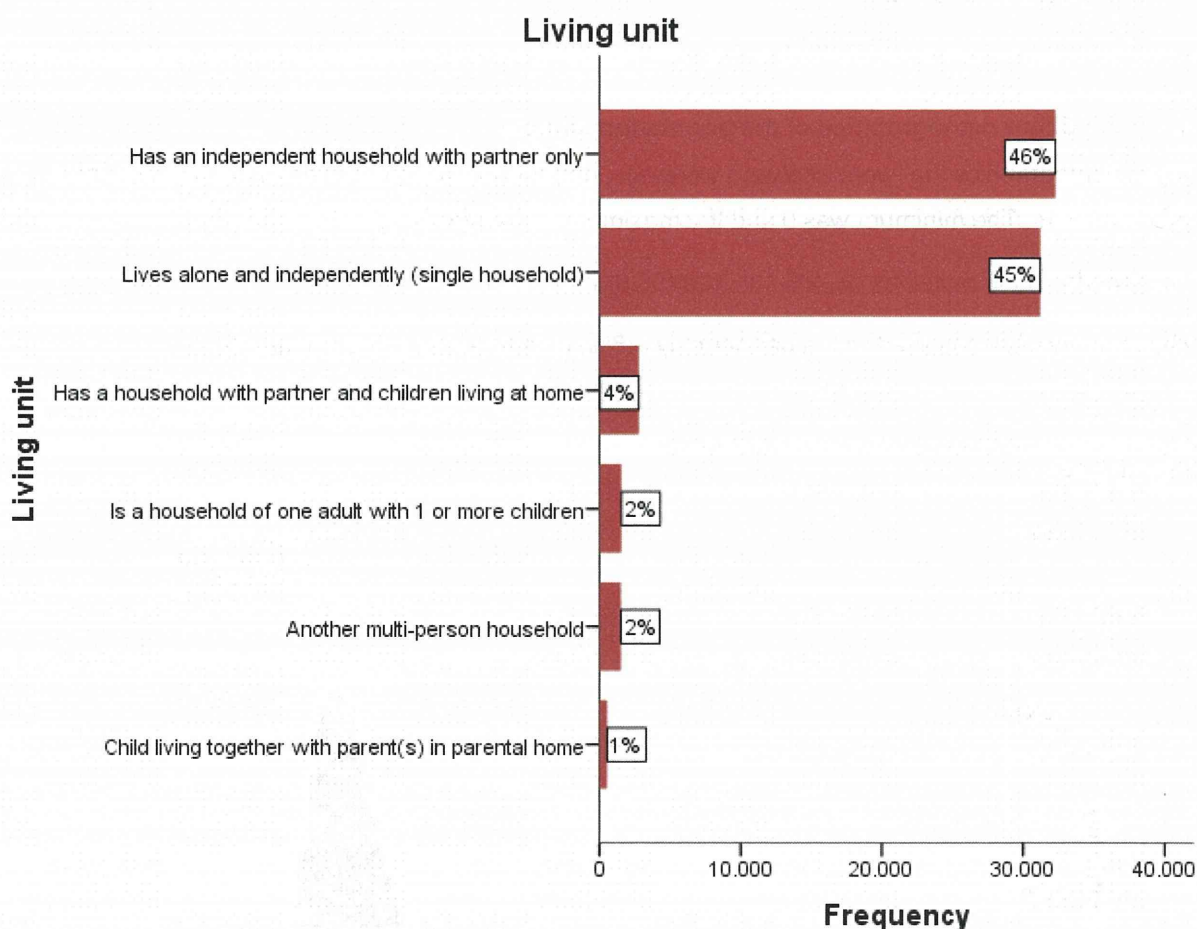


FIGURE 3 LIVING UNIT



4.2 Client types, actual problems and signs and symptoms

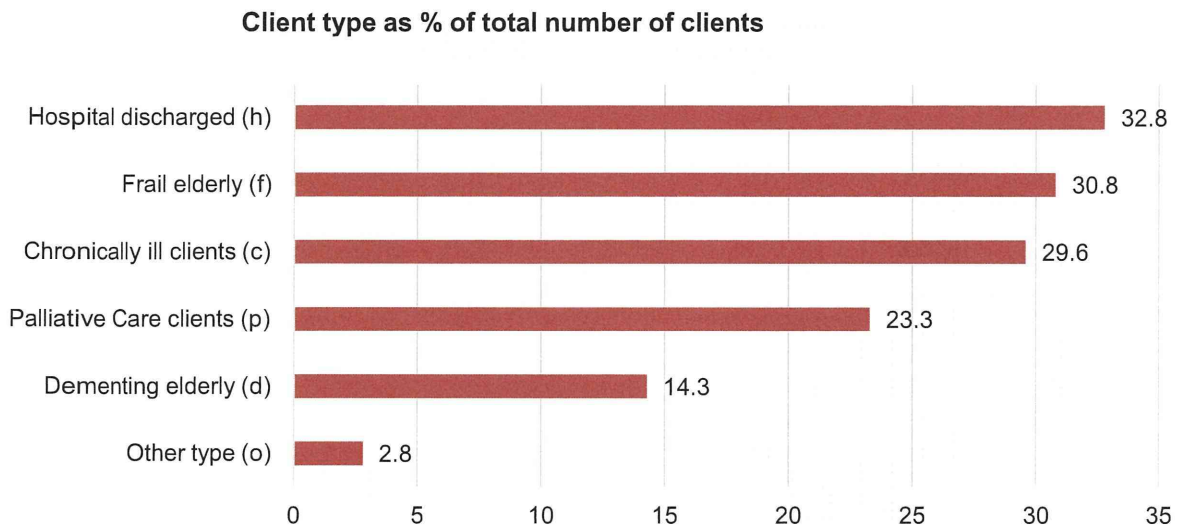
Health related characteristics that could be documented in the point of care software ranged from general to more specific. Three 'levels' of health related characteristics can be defined:

- Level 1 characteristics are client types: chronically ill clients, dementing elderly, frail elderly hospital discharged, palliative care clients, other
- Level 2 characteristics: client's actual problems and nursing diagnoses
- Level 3 characteristics: signs and symptoms, indicating and specifying actual problems

4.2.1 Client types

For 77,129 clients, a total of 103,031 client type characteristics were reported. Figure 4 shows the percentage of clients for whom the client type was defined. A client can have one or more client type characteristics during one or more episodes of care. Therefore, percentages in the bar chart (Figure 4), do not add up to 100%. For example: 32.8% of clients for whom a client type was selected had the client type 'discharged from hospital'.

FIGURE 4 CLIENT TYPES



4.2.2 Actual problems

All of the 42 available problems in the Omaha System were used for documenting. In Appendix A results are shown for all documented Actual Problems. For a sample of 42,519 clients actual problems could be analyzed. The number of problems per client ranged from 1 to 28. For 50% of clients 1 to 3 actual problems were documented (Figure 5 number of actual problems). A total number of 17,408 unique situations occurred. A situation could be 'having problem x only', or 'having problem x and y and z' or 'having problem a and z', etc. The most prevalent situation occurred in 2.5% of cases; these approximately 1000 clients had the same single problem or combination of problems. Theoretically each client within the data sample could have their own unique documented situation, resulting in a total of 42,519 unique situations. In that case, no two clients would have the same one problem, or the same combination of problems.

Problems were determined as 'common' for further analyses if they occurred for more than 25% of all clients. This led to a 'top 5' shown in Table 3. Problems were also analyzed for certain groups of clients based on client types. Appendix C shows the most common problems per group, or 'client profile'. Paragraph 4.3 (p. 25), explains more about these client profiles.

FIGURE 5 NUMBER OF ACTUAL PROBLEMS

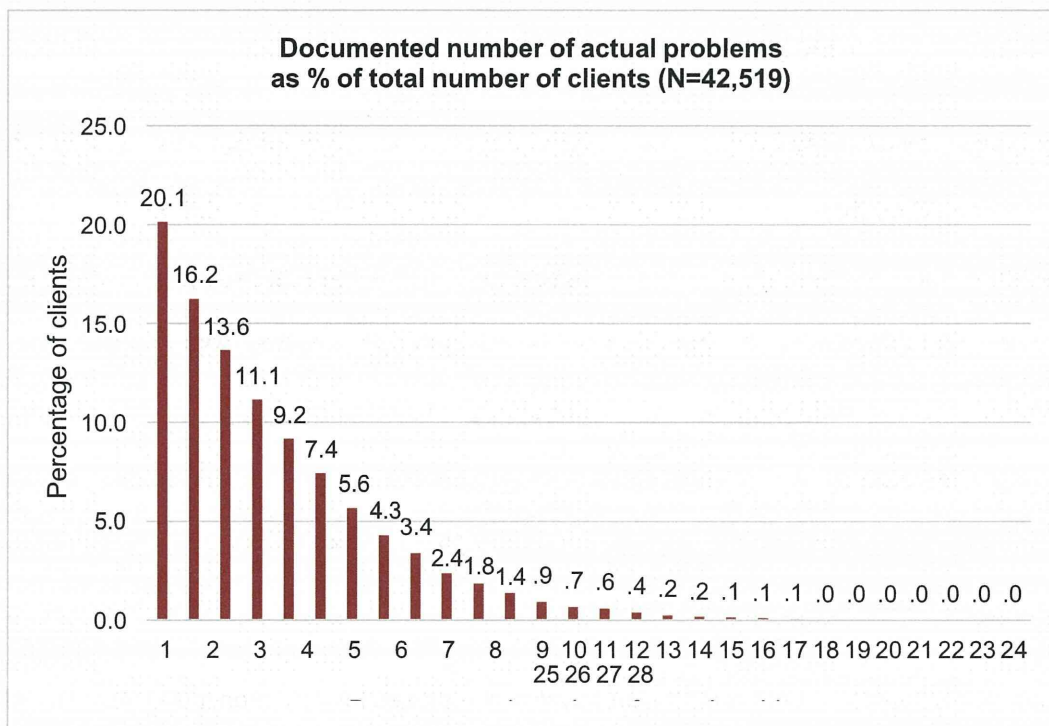


TABLE 3 PREVALENCE OF ACTUAL PROBLEMS, TOP 5

Actual Problems documented >25% for all clients	
	% all clients
Personal care	60.7%
Skin	40.8%
Medication regimen	40.0%
Circulation	33.2%
Neuro-musculo-skeletal function	25.0%

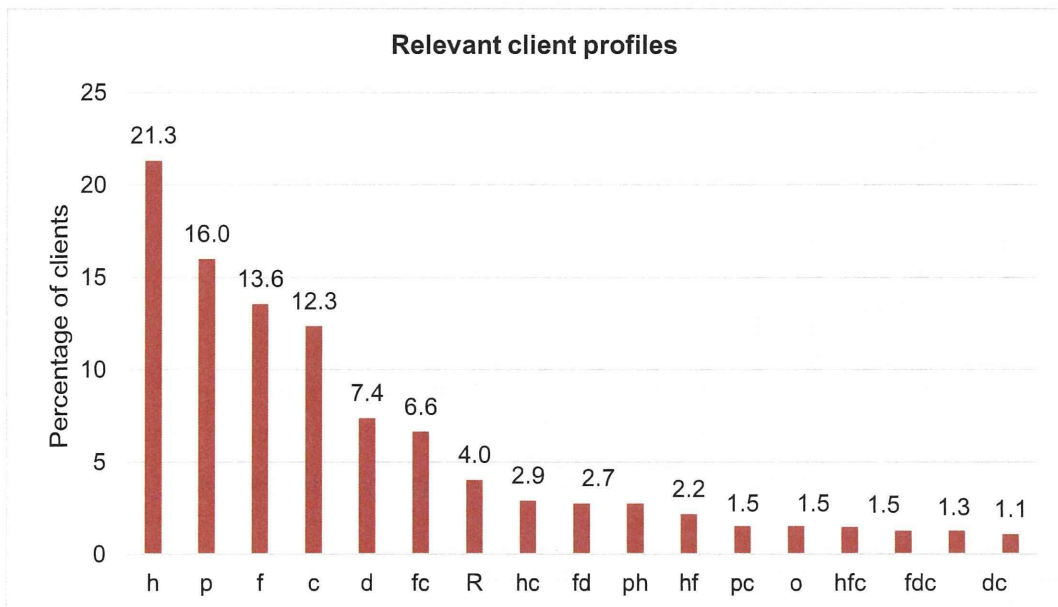
4.2.3 Signs and symptoms

Actual problems in the Omaha System are always specified by one or more unique signs or symptoms. Of the 376 possible signs and symptoms 364 were used for documentation. The number of signs per client ranged from one to 144. For 50% of the clients 1 to 6 signs or symptoms were documented. For an additional 25% of clients, 7 to 14 signs or symptoms were documented. A total of 31,899 unique situations occurred. A situation could be 'having sign x only', or 'having sign x and y and z' or 'having sign a and z', etc. The most prevalent situation occurred in 1.3 % of cases. An overview of the most documented signs and symptoms for the most documented actual problems is given in Appendix B.

4.3 Relevant client profiles based on client types

Since a client can have one or more client type characteristics during one or more episodes of care, combinations are possible. All occurring combinations were analyzed, such as: 'palliative care client and hospital discharged (ph)', or 'frail elderly and dementing elderly (fd)'. A total of 56 profiles were identified and a client can only have one unique profile. A profile can be 'palliative care client', or a combination. All profiles that occurred in less than 1% of cases were considered rare and were analyzed as one group (represented in further figures and tables as 'R'). All profiles occurring in more than 1% of cases were defined as 'relevant client profiles'. This resulted in 16 relevant client profiles and one profile 'R' as shown in Figure 6. For example: most clients, 21.3 %, had the profile 'hospital discharged', while 1.1 % of clients had the profile 'palliative care client and frail elderly'.

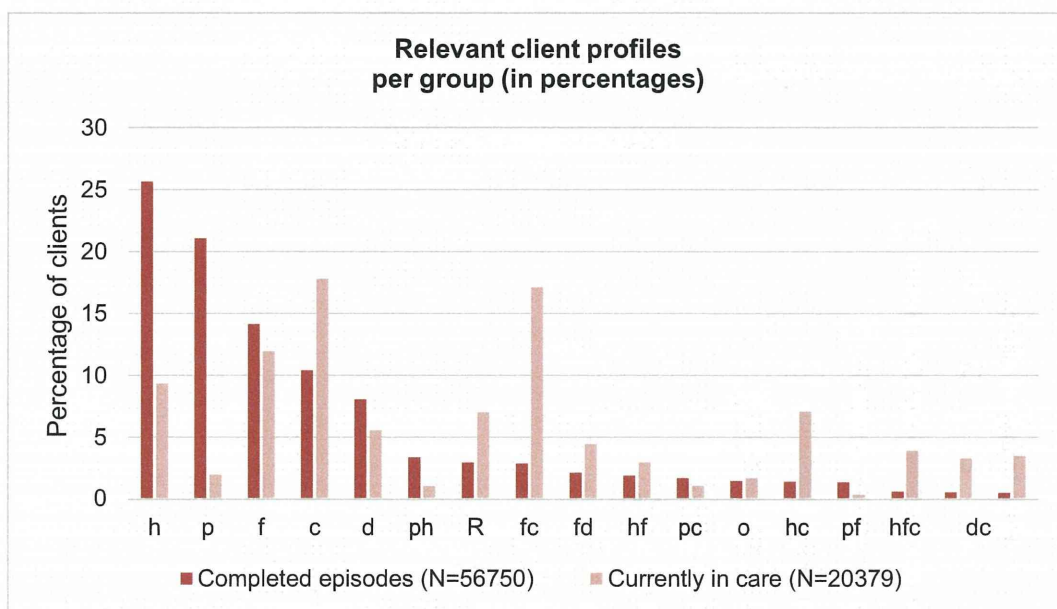
FIGURE 6 RELEVANT CLIENT PROFILES



c = chronically ill clients, d = dementing elderly, f = frail elderly, h = hospital discharged, o = other, p = palliative care clients, R = rare combinations

The prevalence of relevant client profiles should be analyzed separately for clients currently in care and clients with completed care episodes. An explanation was given in paragraph 3.2.1. Figure 7 shows that the prevalence of client profiles differs substantially for clients 'currently in care' versus clients with 'completed episodes'. Palliative care clients are approximately 10 times more prevalent in the group of clients who have completed episodes (21%) than in the group of clients who still receive care (2%). The opposite occurs for the combination 'chronically ill clients and frail elderly': they are up to 7 times more prevalent in the group of clients who are currently in care than in the group of clients who have completed episodes.

FIGURE 7 PREVALENCE OF PROFILES PER GROUP (IN CARE VS. COMPLETED EPISODES)



c = chronically ill clients, d = dementing elderly, f = frail elderly, h = hospital discharged, o = other, p = palliative care clients, R = rare combinations
 THE FIGURE SHOWS PERCENTAGES PER GROUP 'IN CARE' VS. 'COMPLETED EPISODES'. ALL DARK RED BARS ADD UP TO 100% AND ALL LIGHT COLOURED BARS ADD UP TO 100%.