Author's response to reviews

Title: Variations in levels of care between nursing home patients in a public health care system

Authors:

Øystein Døhl (oystein.dohl@ntnu.no)
Helge Garåsen (helge.garasen@trondheim.kommune.no)
Jorid Kalseth (jorid.kalseth@sintef.no)
Jon Magnussen (jon.magnussen@ntnu.no)

Version: 2  Date: 20 December 2013

Author's response to reviews: see over
Authors’ response to reviews.

Title: Variations in levels of care between nursing home patients in a public health care system

Authors:
Øystein Døhl oystein.dohl@ntnu.no
Helge Garåsen helge.garasen@trondheim.kommune.no
Jorid Kalseth jorid.kalseth@sintef.no
Jon Magnussen jon.magnussen@ntnu.no

Version: 2.

Authors’ response to reviews:
Trondheim 20.12.2013
Editorial board
BMC Health Service Research.

Dear Sir

Thank you for constructive comments to improve our article. A revised version is attached, below is our specific responses to the comments from the reviewers.

Reviewer number 1:

Abstract:
“I would like to have seen a little more information in methods section here, including the number of patients and care institutions as well as a description of care as hours of contact.”

Response: The abstract is expanded in line with the comment.
Methods:

a. “Institutions: I would have liked a little more information on the range of residents per institution and the difference in residents between nursing homes (NH) and sheltered dwellings (SD).”

Response: Table 1 is expanded to include median, minimum, maximum and quartiles. We have added some information about the differences between nursing homes and sheltered housing in the section “Nursing home characteristics”.

b. “I think the fact that levels of care is being defined as time spent with patient is important to be stated clearly.”

Response: We have now underscored this point both in the method section in the abstract. We have also added “…only» direct time…” on page 7, second sentence in the “The time study” section.

b. “The recording of the time schedules is very important and a little more detail on the training of the recorders would be helpful; also do the authors know whether this was successful … as another interpretation of the results is that people recorded things differently in different settings?”

Response: We have added a more detailed description of the training of the personnel in the “The time study” section.

c. “Why were personal care and assistance with meals separated out for special attention? Surely medical care would have been more important for NH residents.”

Response: Personal care and assistance with meals was separated out because they covered respectively 48% and 27% of the total direct care. Medical care
only covered 8% of the total direct care. We have done a similar analysis on medical care. The main result from this analysis is that individuals with diabetes received more medical care than others. The decision to leave the analysis of medical care of the results section, was also based on the already rather complex table 3.

d. “Analytic strategy: very appropriate, though I wonder if the stratifying by NH/SD rather than including a dummy variable would have been a better approach.”

Response: A very good point and we considered using a stratified analysis. A problem with this approach is that the limited number of sheltered housing units. Our data consists of 10 units and a total of 124 patients. Thus it is difficult to make precise estimates for this group. We have redone the analysis by excluding the sheltered housing units. The ICC increased marginally from 24.0% to 25.5% in model 1, and from 22.1% to 25.3% in model 2. The confidence intervals of the estimates generally were wider. Also, the scale effect became insignificant. This is probably due to the effect of the smallest nursing home (sheltered housing) disappeared. Our view is that including the sheltered housing by a dummy variable strengthens the analysis.

Discussion

a. “Nomenclature: the discussion section talks about NH residence but presumably this includes both types of institution; perhaps a more generic overarching term would be helpful?”

Response: This is now clarified in the «nursing home characteristics» section.

b. “Many of the findings are intuitively correct (though rarely empirically substantiated), and are appropriately discussed; one thing which I may have
missed was a discussion of the rather surprising finding of more contact time in privately run homes.”

Response: This point is expanded in the discussion section.

c. "Another alternative for the inverse relationship between care and some levels of disability may be differential levels of movement restriction including differing levels of medication.”

Response: We agree, and have taken the liberty of including this comment in the discussion section.
Reviewer number 2

Major revisions:

1. “The authors should be clearer in distinguishing between average or aggregate care time delivered by facilities and the care time received by individual residents. The Background paragraph in the abstract, for example, makes it appear as if the central research issue is variation in care time between facilities. The Results paragraph in the abstract is difficult to decipher without this distinction between facility and resident levels. What is “total individual care”? Does “ADL” refer to individual resident ADLs or average ADL dependency in the facility? Although I take these examples from the abstract, the confusion between levels of analysis and their interpretation is a problem throughout the manuscript.”

Response: We have tried throughout the paper to make the distinction between average care on a nursing home level, and the marginal effects on individual care caused by changes in ADL/IADL. In addition “average ADL” is now replaced with “average case-mix” to avoid mixing individual level ADL with average case-mix in the nursing homes.

2. ”The authors should describe global budgeting in more detail. Is each facility given a uniform budget based only on the number of residents it cares for, or do other considerations affect the global budgets?”

Response: A more detailed description of the global budget model is added in section two under “Institutional setting and study area”.

“It appears from the figure (poorly labeled and described) that facilities differ substantially in their average hours of care per resident per week. What accounts for this variation – global budgets or internal allocations to direct care or other areas? Municipal budgeting processes and internal management decisions, which are unmeasured variables, may help account for the unexplained inter-facility variation in care time.”
Response: We have changed figure 1. The figure shows mean direct time as well as 95% confidence intervals for each nursing home.

The large variation between facilities remains unexplained after this study. We have tried to expand the discussion along the lines suggested by the referee.

“Also, where does the resident’s private payment fit into the global budgets? Do private payments represent additional resources beyond the municipal budget?”

Response: A more detailed description of how the residents’ payment goes into the global budget is added in in the last section under “Institutional setting and study area”

“Unmeasured external factors should be described and discussed in the manuscript.”

Response: We have included a brief discussion of what we consider to be the two most important unmeasured external factor; management skills and the functionality of the buildings.

3. “Do Norwegian facilities perform post-acute care or rehabilitation? If yes, were these resources left out of the study? If not, then the authors should note the difference in the types of residents and facilities in their samples.”

Response: Yes, but these individuals are not included in the analysis. This is now clarified in the end of the first section under “Nursing home characteristics”.

4. “The methods section and Table 1 should have more information about the nursing homes. For example, what were the mean and median per resident care times, minimum and maximum, and interquartile range? What about inter-facility variation in number of direct care staff and skill mix?”

Response: A revised version of table 1 is added.
5. “Did the 2 staff members in each facility register (record) care time provide by all staff on the shift or just for themselves? If only themselves then this would be a study limitation with some (much?) time unaccounted for in the study.”

Response: We have added a more detailed description of the training of the personnel in the “The time study” section. Here we have specified that direct care provided by all the staff was registered.

6. “The authors might address the issue of capacity vs. opportunity to perform IADLs or ADLs.”

Response: We have added text at the end of the first section under “Disability data” to clarify that capacity and not opportunity is measured.

Minor revisions:

7. “Explain the difference between the traditional NH and extra sheltered housing facilities. Do they differ mainly in payment mechanism or are they organized and staffed differently?”

Response: A more detailed description of the differences and similarities are added in the first section under “Nursing home characteristics”.

8. “Point out that the choice of a sample from one municipality may simplify the study (page 5) but it also limits generalizability.”

Response: We have added a section at the end of the “Discussion”

9. “Consider using the terms ADL dependency and IADL dependency; the terms ADL and IADL used alone are ambiguous.”

Response: We agree that ADL/IADL dependency or disability is a more precise term than ADL/IADL. We have added disability in the first section of paper. From the
“Results” and the latter part we still use ADL and IADL. We were concerned about the readability when the term is repeated several places. We have added a specification at the start of the “Results”- “Individual level variables” section.

10. “Page 8, end of first paragraph “… score three (two?) or higher …”

Response: We have tried to clarify this in the first section under “Disability data”.

11. “Add to the discussion section. Did study results lead to new case-mix based budgeting system? Does the new system include IADLs and does it recognize interactions between resident ADL, IADL, and cognitive impairment?”

Answer: A new budgeting system was introduced as a result of the time study. We have tried to clarify this in the introduction.

Discretionary Revisions:

12. “The description of main and interaction effects on pages 12-13 is complicated. The higher-level interpretation of findings in the discussion section makes the interactions more understandable. Could some of that interpretation be woven into the presentation of findings?”

Response: We have chosen to retain the description.
Reviewer number 3

Major revisions:

1. “Restriction: “To avoid confusing different levels of care with different prioritization between local authorities we have limited our analyses to nursing homes in one municipality; the city of Trondheim with 180,000 inhabitants” is in a way justified for logistic reasons, but then one of the key determinants (explanation factors) may be missed. This should be developed more in the discussion.”

Response: We have added a section at the end of the “Discussion”

2. “Another missing factor is the availability of nursing home beds in the area and to what extent this may influence the results (as for example: the number of beds per 1000 persons 80+ in an area). In a country there may be a very big variation of available nursing home beds. To what extent is the area representative of e.g. Norway.”

Response: The availability in Trondheim compared to national level is added in the first section under “Institutional setting and study area”.

3. “Staff skill mix is characterized by two variables; the proportion of employees with health related college/university degree and the proportion of employees with a health related upper secondary education. This means that is there is no quantified staff ratio (or similar, showing the number of staff in relation to the number of residents) for the different nursing homes (for example the number of aides per resident around the clock), which is a great disadvantage since used care time depends on the available resources at different settings.

Or…?? In the result section I read this: “Direct care constituted about 60 percent of the available staff hours” meaning that there is information on the number of staff issue?? On the individual nursing home level?”
Response: We have tried to clarify this in the description of skill mix. Skill mix measured as *shares* is included to test whether the skill/quality of the personnel is associated with variations between nursing homes. We read the referee’s point as a question of whether not the *ratio* of personnel to users is likely to affect the level of care. However, as now better described in the budget model, there is little variation between nursing homes in this ratio. We were also concerned about of the possible endogeneity of staffing ratios.

4. “p 12, top: “A more resource demanding case mix on nursing home level seems to decrease the amount of individual care given. A tenth of a unit increase in the average nursing home ADL-score decreases the average amount of direct individual care for patients with about three percent. “

This seems strange, shouldn’t it be the opposite unless the number of staff is so limited that there is no space for increase in care time when needed resulting in this paradoxal result)?? On the hand 40% of care time seems to be for something else not captured in this study. Please clarify.”

Response: This relates to the budget model. With a budget that is unrelated to case-mix, an increase in case-mix will imply less time available for the other users. We have tried to clarify this in the second section under “Discussion”.

5. “The comments of the results of model 3 in table 3 are rather detailed and somewhat confusing (and over interpreted in my view, it is many ups and downs which does not seems to be logical from a clinical viewpoint). How do the per cent comments in the text correspond to the figures in the columns of table 3 (and model 3)?

   Example 1: text: “For the average patient the marginal effect of one point increase in ADL was 27 percent”. Where can I find that in table 3? 1-0.73=0.27??

   Example 2: text: Those with dementia/Alzheimer and stroke got respectively 7 and 9 percent more personal care. Those with stroke got 10 percent less assistance with meals.
In table 3 under model 3 I can read under column personal care for dementia/Alzheimer and stroke respectively: 0.06 and 0.09 (6 and 9%?) and meals for stroke: 0.10 (10%?).

Please clarify.”

Response: We agree that the results are not easy to grasp. The main reason for this is the interaction effect. We believe that the interaction effect, especially between cognitive impairment and ADL, is an important finding in our study. We have tried to clarify the connection between the values in table 3 and the text in the “Results”.

Also note that Kennedy’s approximation, which is used for categorical variables, are the values in the brackets in table 3. In the “Analytical methods” we point out that the interpretation of the Kennedy’s approximation is percentage increase in the depended variable for a change in the categorical variable.

Minor revisions:

1. “Please clarify the rationale for a cut off of 3 hours/week for informal care”

   Response: These were the data available to us. This is now clarified in the text.

2. “Factor analysis should be as an appendix in the net version and not as a request.”

   Response: The factor analysis is added as an appendix.

Editorial Requests

Ethics statement: “Please move your ethics statement to the 'Methods' section of the manuscript.”

Response: The ethics statement is moved to the Methods section.
Sincerely yours,
Øystein Døhl

Author of Correspondence
PhD Candidate
Department of Public Health and General Practice
Faculty of medicine
The Norwegian University of Science and Technology (NTNU)
NO 7491 Trondheim, Norway
E-mail: oystein.dohl@ntnu.no
Phone number +47 952 63 851