Complaints Against Nursing Homes: Comparing Two Sources of Complaint Information and Predictors of Complaints

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Purpose of the Study: Two consumer-derived measures of nursing home quality that have been underutilized by researchers are consumer complaints to the state certification agency between inspections and complaints to the Long-Term Care Ombudsman Program. This article describes these complaints, considers facility-level predictors of complaints, and examines how complaints to the 2 entities are related. Design and Methods: This article uses North Carolina complaint data from the state certification agency and Ombudsman from 2002 to 2006. First, we outline the similarities and differences in the 2 complaint sources by considering descriptive statistics and examining the structure of the 2 agencies. Second, we examine the relationship between complaints and facility characteristics that have been predictive of traditional quality measures. Finally, we examine the relationships between the 2 types of complaints. Results: We find that complaints to the 2 agencies exhibit distinct differences in substantiation rates, although the top complaint category for both agencies is quality of care. Having a higher proportion of Medicaid residents is generally not predictive of complaint volume, whereas having a higher proportion of Medicare residents is associated with higher complaint levels. Implications: We find a lack of association between complaints to the 2 agencies when examining specific matched categories of complaints in many cases, suggesting that the 2 entities are not duplicating efforts in these categories.

Key Words: Consumer-directed care, Long-term care, Quality of care, Nursing homes

Meaningful measurement of nursing home quality continues to be debated by researchers (Castle & Ferguson, 2010). The most common data sources for the construction of quality measures are data from the Centers for Medicare and Medicaid Services (CMS). These include information from the survey and certification process and resident-level measures from the Minimum Data Set, both of which are generated from state certification agencies and the nursing home facilities themselves. Included among these traditional measures of quality are inspection-oriented deficiencies, staffing levels, and the presence of certain resident-level quality indicators.

Another potential source of quality information are data on complaints against nursing homes, which can occur at any time and result from consumer action. There are two key agencies that receive and investigate nursing home complaints: the state certification agency (which is also responsible for the annual inspection) and the state Long-Term Care Ombudsman Program. Both sources of consumer-reported complaints have been underutilized by researchers. Although Stevenson (2005, 2006) studied complaints to state certification agencies and Allen, Klein, and Gruman (2003)
considered complaints to the Connecticut Ombudsman, no work has considered both sources of complaints simultaneously.

The roles of the state certification agency and the Ombudsman in receiving and handling complaints are very different. This article uses these complaints in three key ways. First, given that the two types of complaints may capture different dimensions of quality, it is instructive to consider a number of different aspects of both types of complaints, using the same set of nursing homes over the same time period. Second, using quarterly complaint data for 2002–2006 from the North Carolina (NC) Ombudsman and from the NC Division of Health Service Regulation (the state certification agency), complaints in a quarter will be modeled as a function of traditional facility-level predictors of nursing home quality. Little research has considered characteristics of nursing homes that predict consumer complaints to the Ombudsman or to the state certification agency, and no study has examined the effects of these facility characteristics for both types of complaints using the same nursing homes. Third, we will examine the association between the two types of complaints and subsets of each type of complaint.

Literature Review

Traditional Nursing Home Quality Measures

Historically, measures of nursing home quality have included facility-level measures of staffing and inspection deficiencies cited during the approximately annual survey process. These data are gathered from nursing homes during the annual certification survey by state certification agencies, are transmitted to the federal CMS, and become part of the Online Survey Certification and Reporting (OSCAR) system. Although these traditional measures of quality continue to be considered by researchers, more recent work has also focused on other quality measures. (See Castle & Ferguson, 2010 for an insightful review of nursing home quality identification and measurement.)

Facility-Level Predictors of Traditional Quality Measures

Given that little research has been done using complaints against the nursing home as a measure of quality, we turn to the literature on facility-level predictors of traditional quality measures to provide guidance regarding the anticipated effect of these same facility-level characteristics on complaints. The key facility-level predictors of quality we examine are proprietary status, chain inclusion, the payer mix, and facility size.

Consideration of the effect of profit status on quality has often revealed that for-profit facilities produce lower quality care (Castle, 2000; Grabowski, 2001; Harrington, Woolhandler, Mullan, Carillo, & Himmelstein, 2001). Hillmer, Wodchis, Gill, Anderson, and Rochon (2005) examined empirical research on profit status from 1990 to 2002; this review suggests that for-profit homes had lower quality in terms of deficiencies and other measures. However, the potential for omitted variables that are correlated with ownership type and predictive of quality exists, where such a relationship would bias the coefficient on ownership type in a model of quality. To circumvent the omitted variable problem, Grabowski and Stevenson (2008) analyzed nursing homes that changed proprietary status. They found evidence that not-for-profit facilities converting to for-profit status are generally declining in performance and facilities converting from for-profit to not-for-profit status are improving in performance with both of these trends continuing after conversion. This suggests little causal effect of ownership change on quality of care in nursing homes.

Being a part of a chain has generally been associated with lower quality of care in nursing homes, but the results are mixed. For instance, Harrington and colleagues (2001) concluded chain ownership predicted higher deficiency rates and a higher rate of severe deficiencies, whereas Graber and Sloane (1995) found no effect of chain affiliation on deficiencies for physical restraint use in NC nursing homes. A larger proportion of Medicaid residents has been associated with an increase in all deficiencies (Gertler, 1989; Nyman, 1988) and quality of care deficiencies (Harrington, Zimmerman, Karson, Robinson, & Beutel, 2000; Harrington et al. 2001).

Finally, the evidence on the effect of facility size on quality suggests a negative relationship. Rantz and colleagues (2004) showed that smaller facilities have better resident outcomes, and Harrington and colleagues (2000) showed that smaller facilities were less likely to have quality care deficiencies and had a lower total number of deficiencies.

Consumer Complaints as Quality Indicators

Recently, there has been a call to find additional sources of quality measurement that include the
perspective of the nursing home consumer (R. A. Kane, 2003; R. Kane & Kane, 2001). However, gathering consumer satisfaction data directly from the nursing home population is difficult due to expense, cognitive limitations of residents, and accessibility of researchers to this population.

In 1985, in one of the first national studies to consider residents’ perspectives, the National Citizens Coalition for Nursing Home Reform (NCCHNR) surveyed residents and found that the residents’ notions of quality were not necessarily reflected within regulatory processes (NCCHNR, 1985). Since then, the nursing home survey process has expanded to encompass resident viewpoints by including individual resident interviews and meetings with the facility’s residents’ council by state surveyors. This change, while important, only captures consumer concerns approximately annually.

Another avenue nursing home residents have for expressing opinions regarding concerns about quality is the complaint investigation process by each state-level certification agency. Unlike annual certification surveys, complaint investigation surveys may be triggered anytime a complaint that is within the scope of CMS regulations is received by the state, outside of the normal annual survey timeframe. Interestingly, very little research has been done using these complaint data. Stevenson (2006) argued that the motivation and determination needed to file a complaint with the state, and the consideration of the possible negative costs such as retaliation against the complainant may make these complaints more representative of consumer perspectives and provide a more dynamic “real-time” perspective of quality than an annual survey measure of quality. Both Stevenson (2005, 2006) and Grabowski (2005) have suggested that the use of nursing home consumer complaints should be considered as an additional signal of facility quality.

Another source of information that is grounded in the consumer’s perspective is complaints to the Ombudsman. Nelson, Huber, and Walter (1995) suggested that the Ombudsman complaints may be a more accurate reflection of nursing home problems than CMS survey results because the Ombudsman are in contact with the residents in nursing homes on an on-going basis. In 1978, federal legislation through the Older Americans Act (OAA) created the Long-Term Care Ombudsman Program. The intention of the program is to improve nursing home residents’ chances for fair consideration, due process, and choice (Persson, 2002) and thereby improve the living conditions and quality of life of nursing home residents. Under the OAA, these programs are directed to provide advocacy on individual, facility, community, and governmental levels by complaint mediation, on-going direct contact with residents and families, staff education, and working on laws, regulations and governmental policies which effect long-term care facility residents (Administration on Aging [AoA], 2000). Overall, the program has been viewed as being very effective in terms of mediating and resolving consumer complaints within long-term care and acting as advocates for this population within the policy arena (Estes, Zulman, Goldberg, & Ogawa, 2004; Harris-Wehling, Feasley, & Estes, 1995). Despite the presence of the Ombudsman within each state and the numerous complaints the program receives directly from nursing home consumers, complaint data are seldom studied for several reasons. The categorization of quality complaints and databases used to track them vary widely across states (Huber, Borders, Netting, & Kautz, 2000). In some states, the complaint data system is not designed to produce data beyond reports sent directly to the AoA. Also, the Ombudsmen are also often concerned about confidentiality issues surrounding releasing complaint-level data to researchers.

Most studies on the Ombudsman Program have examined program effectiveness (Estes et al., 2004; Keith, 2001; Nelson et al., 1995), structural organization (Huber, Netting, & Kautz, 1996), and complaint-reporting systems used within the program (Huber, Borders, Badrak, Netting, & Nelson, 2001). Limited research has addressed using the Ombudsman complaint data as a possible quality assessment tool (Allen et al., 2003).

**Background on the NC Division of Health Service Regulation and the Long-Term Care Ombudsman Program**

Both the state certification agencies and the Ombudsman have the nursing home resident as their focus when considering complaints regarding facilities, but they differ on a number of other dimensions. Certification agencies try to ensure a minimum standard of care based upon federal regulations and guidelines. The Ombudsman seeks to be a resident advocate, assisting and empowering residents in resolving complaints. Although both processes strive to be resident centered, there are
differences between the two due to federal and state regulations that may have an effect on the types and numbers of complaints called into each program and the ability to substantiate specific complaints.

**Program Accessibility**

The North Carolina Division of Health Service Regulation (NCDHRS) follows survey protocol and guidelines set forth by CMS, where nursing homes are inspected through a survey process every 9–15 months. Between certification surveys, complaints may also be investigated. These complaints may be made by the resident, family, staff, or general public and are received by DHSR by phone, fax, or e-mail. The complaint process is often difficult to navigate, particularly by residents with limited functioning and a lack of resources.

In contrast, the NC Ombudsman follows guidelines set forth through the AoA and policies established by the NC Division of Aging and Adult Services. The Regional Ombudsmen in NC are located within the 17 Area Agencies on Aging (AAA) throughout the state and serve residents in both nursing homes and adult care facilities. Currently, there are 36 Regional Ombudsmen, each with 1–6 Ombudsmen covering 3–10 counties, depending upon the local AAA budgetary ability and priorities. The Ombudsman has a representative from the program in each nursing home at least quarterly, even when no complaint allegations are present. This representative may be the Regional Ombudsman or members of the County Community Advisory Committees, the volunteer component of the North Carolina Long-Term Care Ombudsman Program (State of North Carolina, 1977). The program’s presence in the facility may be in the form of a friendly visit, where the representatives introduce themselves and converse with residents; a training visit, where education is provided for residents or staff on topics such as residents’ rights; or a complaint/mediation visit, where the program representative is attempting to assist in complaint resolution. Due to the availability of the Ombudsman Program within the facility, both residents and staff become comfortable with the representatives and have greater opportunity to file a complaint without the barriers associated with contacting the DHSR.

**Access to Information**

The DHSR and the Ombudsman differ in access to information and specific areas within facilities. The DHSR has the authority to access resident medical records for complaint validation without prior discussion with the resident or their legal representative. This allows them to look at records for a resident or a sample of residents to substantiate a complaint and determine the breadth of a problem. The DHSR may also access areas of the facility that are generally off-limits to the general public to assist in their complaint investigation, including internal facility incident reports, the kitchen, the medication room and carts, and the janitorial closets.

In contrast, the Ombudsman is limited in their access to such information. To access medical records, the Ombudsman must have a court order or permission from the resident or the resident’s legal representative. The Ombudsman must also comply with Health Department regulations, which prohibit access to some areas, such as the kitchen. Due to these differences, the two programs may validate complaint allegations in different ways; the DHSR may rely more heavily on document review for “proof” of a complaint, where the Ombudsman may consider interviews with staff and residents more significant. In addition, the DHSR only considers complaints that fall within the purview of the federal regulations for nursing homes set forth by CMS. In comparison, the Ombudsman does not have a specific scope in which the complaints must fit.

**Complaint Actions**

The programs also differ on the actions taken on substantiated complaints. The DHSR cites the facility with a deficient practice under one or more specific regulatory categories. The facility is then required to develop and implement a plan of correction for each specific deficiency, and the DHSR follows up to ensure plan implementation. The Ombudsman has greater flexibility in addressing complaints. They may work to resolve the complaint by mediation between the complainant and the administration or staff, provide staff training and education to address the issue, or work directly with the facility ownership to address corporate policy.

**Relationship Between NC DHSR and Long-Term Care Ombudsman Program**

Due to the differences stated above, it is necessary for the programs to work together to help to ensure residents’ concerns are addressed.
This is done on several levels. Through federal guidelines, the DHSR contacts the Ombudsman upon entry into a facility for the annual survey. The Ombudsman may then share areas of concern and complaints they have received regarding the facility. They may also suggest potential residents for the survey sample, closed record review, or interviews. The Ombudsman may also contact family members of residents to encourage them to talk with the DHSR survey team about any concerns. Often the Ombudsman will attend the resident meetings held by the survey team during the survey process. If residents are familiar with the Ombudsman, his or her presence helps to encourage candor by the residents. In addition, it also allows the Ombudsman to hear current concerns, which may need follow-up. The Ombudsman may also attend the exit interview of the survey process, where the survey team discusses and explains all the deficiencies that have been found during the survey period to the management team of the facility.

The Ombudsman often refers unresolved complaints and complaints which the Ombudsman may not have full authority to investigate, such as those which require access to medical records, to the DHSR. At times, the Ombudsman will assist residents and families in navigating the DHSR complaint process, encouraging them to file a complaint without the Ombudsman Program’s direct involvement. Conversely, the DHSR may refer individuals to the Ombudsman when the complainant has a concern, which is outside the scope of CMS regulations.

**Design and Methods**

**Data**

*Long-Term Care Ombudsman Program Complaints.*—Data from complaints to the Ombudsman in NC from fourth quarter 2002 through third quarter 2006 for 379 nursing homes are used in our analysis. Although the Ombudsman handles complaints on all skilled nursing homes in the state, we limit our analysis to complaints against freestanding facilities that are certified by CMS. Hospital-based facilities face a different inspection process governed by the Joint Commission on Accreditation of Healthcare Organizations, and there are more complaint reporting options available to consumers of hospital-based skilled nursing facility services. We also eliminate complaints to the few nursing homes that did not accept Medicare or Medicaid and, thus, were not subject to the same inspection and reporting processes as Medicare/Medicaid-certified facilities.

The Ombudsman complaint data indicate the quarter and year of each complaint filed; whether the complaint was substantiated, unsubstantiated, or withdrawn; the complaint category; and by whom the complaint was investigated. A list of complaint codes from the NC Ombudsman database is available from the authors upon request. Although we present descriptive statistics on Ombudsman complaints investigated by the DHSR, these complaints are likely to show up in the OSCAR complaint database. Therefore, we exclude these complaints from the subsequent analyses of Ombudsman complaints to avoid double counting.

**DHSR Complaints and Facility Measures From OSCAR.**—We consider complaints against NC nursing homes filed with DHSR that appear in the OSCAR database over the same period for which we have Ombudsman complaint data. The OSCAR database contains information on all Medicare- and Medicaid-certified nursing homes. In NC, the DHSR is required to investigate all nursing home complaints filed with the DHSR that fall under their regulatory purview and submit data to OSCAR about those complaints. The OSCAR database includes information regarding the timing of the complaint and whether the complaint was substantiated by DHSR investigators. When a complaint is substantiated, it often results in a deficiency citation, where information about the type of deficiency and scope and severity of the deficiency is recorded. In this analysis, we group DHSR complaints from OSCAR with deficiencies into the nine categories used for publicly reporting quality indicators for nursing homes on the Nursing Home Compare Website (www.medicare.gov/nhcompare). The specific deficiencies contained in each category are found in the State Operations Manual: Appendix PP (CMS, 2007).

From the OSCAR database, we use DHSR-gathered information from the approximately annual nursing home inspection on the following facility characteristics: proportion of residents who are Medicaid funded, proportion of residents who are Medicare funded, and proportion of residents who were funded by other sources; whether the facility is for-profit, not-for-profit, or government owned; whether the nursing home is part of
a chain; the number of residents in the facility; the mean proportion of residents with activities of daily living limitations in four areas (toileting, transferring, incontinence, and eating); and the total number of beds in the facility.

**Analytical Approach**

Given that both Ombudsman complaints and DHSR complaints (from OSCAR) have received limited attention by researchers and vary markedly across states, we begin with descriptive statistics for both types of complaints. We consider complaint substantiation rates, the proportion of each type of investigator for complaints, the proportion of complaints in various complaint categories, and the top five most frequently cited complaints. Next, we match the complaint data sources to each other. All Ombudsman complaints, which are recorded for each facility in each of 16 quarters, are matched to facility-level measures of DHSR complaints in the same quarter. Given that the nursing home inspection OSCAR measures are only available every 9–15 months, we match each set of complaints to the facility characteristics from OSCAR from the current (same quarter) or nearest prior inspection.

First, Ombudsman complaints, DHSR complaints, and subsets of both types of complaints are modeled as a function of facility characteristics using a conditional fixed effects Poisson model. Each observation is a facility in a quarter. The dependent variable for each model is a nonnegative count measure of complaints per 100 residents, given that facilities with more residents are likely to generate more complaints. Our dependent variable displays two characteristics that are likely to cause Ordinary Least Squares estimates to be inconsistent: (1) a substantial number of zeros and (2) right skewness in the distribution (i.e., relatively few high values for the number of complaints per 100 for a small number of facilities, where most values for the number of complaints per 100 are smaller than the mean value). Wooldridge (1999) showed that the conditional fixed effects Poisson estimator used for the analysis in this article produces consistent estimates under very general conditions for a non-negative-dependent variable. The fixed effects specification allows us to control for characteristics that are constant at the facility level over the four years considered, including factors such as urban/rural location and per capita income in the area near the nursing home. Although some of the characteristics (chain affiliation, ownership type) are constant for some facilities over time, we do have some variation in these measures for some nursing homes. We conducted Hausman (1978) tests for fixed effects versus random effects, and in approximately one third of the specifications, we find that the null that the random effects estimator is both consistent and efficient is not rejected. For ease of exposition, however, we only report the fixed effects results. Examination of the effect of facility characteristics on the volume of complaints to the Ombudsman or to the DHSR (and to the OSCAR system) will provide insights into factors that may be correlated with the generation of complaints.

Next, we model Ombudsman complaints per 100 residents as a function of DHSR complaints per 100 residents, controlling for facility characteristics and including time (quarter) and facility-fixed effects. Likewise, we model DHSR complaints as a function of Ombudsman complaints. Following Hickson and colleagues (2002) and Stevenson (2005, 2006), we do not present coefficient estimates. Instead, we present z-scores corresponding to significance levels to indicate the correlation between the complaint measures from the DHSR and Ombudsman. The z-scores are computed using cluster-robust standard errors. For instance, we consider the association between the number of complaints regarding quality of care issues to the Ombudsman per 100 residents and the number of DHSR complaints regarding quality of care. The z-score indicates whether there is a statistically significant positive or negative association between the Ombudsman complaints and DHSR complaints regarding quality of care. The z-scores are presented for both types of complaints.

**Results**

**Descriptive Statistics for Long-Term Care Ombudsman Program Complaints**

As shown in Table 1, over the four years, the Ombudsman received 7,896 complaints against NC nursing homes. Of the complaints received, an overwhelming proportion (90.79%) are substantiated by the Ombudsman. Unsubstantiated complaints, that is, those that were unable to be verified, made up 4.46% of complaints.
The complaint categories represent the eight primary categories used by the NC Ombudsman in their complaint tracking system. All Ombudsman complaints are assigned a complaint category, regardless of whether they are substantiated or not. The top category is quality of care, which included 39.74% of all complaints. This category encompasses most aspects of resident care. It includes four of the top five complaints not referred to DHSR and all of the top five complaints that were referred to DHSR by the Ombudsman Program. The next most frequent category is complaints regarding administration (23.76%). Complaints regarding discharge plans and procedures, which is the top specific complaint that was not referred to DHSR, are in this category. The third most common category of complaints is that of residents’ rights with 12.84% of complaints. It should be noted that
while there are specific complaints in this category in regard to individual rights, all of the complaints dealing with resident rights are dispersed throughout all of the Ombudsman complaint categories.

Complaints to the NC Long-Term Care Ombudsman Program are investigated by a number of different types of individuals/agencies. The majority of complaints are investigated independently by the Regional Ombudsman (86.89%). The Ombudsman Program may also investigate complaints along with other agencies, such as the Attorney General’s Office, CACs, or another advocacy or regulatory agency; 8.24% were handled in this manner.

As discussed above, the Ombudsman will refer a complaint to the DHSR when the Ombudsman is legally unable to investigate the complaint due to regulations, when the Ombudsman feels a complaint may have better resolution from the DHSR, or when a complaint is unable to be resolved. The top five specific complaints referred by DHSR to the Ombudsman include inadequate hygiene care, neglect, inadequate supervision of residents, decubitus ulcers, and resident falls each with 4.9%–5.6% of the complaints received by the program.

Of those complaints not referred to the DHSR, the top five included discharge procedures (7.37%), inadequate hygiene care (4.89%), staff attitudes (4.73%), symptoms unattended (3.06%), and unanswered call bells (2.93%). It should be noted that, by law, the facility is required to provide the name and contact information of the Regional Ombudsman on all discharge notices, which may drive the popularity of this specific complaint. The other four top complaints fall within the broad category of quality of care and are related to inadequate staffing.

Poisson Models: Facility Characteristics Predicting Complaints

Tables 3 and 4 contain the results regarding facility characteristics that are predictive of Ombudsman complaints and DHSR complaints, respectively, per 100 residents, based on estimates of a Poisson model with facility- and time-fixed effects. All complaints, substantiated complaints, and complaints in various categories are considered. Our use of facility- and time-fixed effects means that our relationships are identified by homes that have changes in the explanatory variables (such as chain affiliation and number of beds) over time.

Beginning with payer mix, a higher proportion of Medicaid residents is associated with more substantiated complaints to the DHSR. This finding regarding DHSR complaints is consistent with Stevenson (2006), who used national data from 1998 to 2002. We do not find any significant association between the proportion of the residents that are Medicaid funded and Ombudsman complaints. In contrast, homes with a higher proportion of Medicare residents have significantly more quality of care complaints to both the DHSR and the Ombudsman. Increasing the proportion of Medicare residents also increases the proportion of substantiated complaints to the DHSR and the number of residents’ rights complaints to the Ombudsman.

Turning to other facility characteristics, the effect of for-profit ownership on the number of
Ombudsman and DHSR complaints vary across complaint categories, when statistically significant; for-profits have more complaints to the Ombudsman in the areas of nutrition, residents' rights, and environment and more pharmacy complaints to the DHSR. However, for-profits have fewer complaints of mistreatment to the DHSR and fewer pharmacy complaints to the Ombudsman. We find no effect of chain affiliation on complaints of either type. Finally, although the coefficient on size is not significant for the Ombudsman complaint models, larger facilities have more DHSR mistreatment complaints per 100 residents.

Poisson Models: Association Between Long-Term Care Ombudsman Program and DHSR Complaints

Tables 5 and 6 contain z-values for the association between Ombudsman complaints and DHSR complaints. Table 5 results use the number of Ombudsman complaints per 100 residents as the dependent variable, whereas the Table 6 results use the number of DHSR complaints per 100 residents as the dependent variable. Each cell in the two tables is based on a separate Poisson regression, where the key explanatory variable is the number of complaints per 100 residents from the other agency, controlling for facility characteristics found in Tables 3 and 4 and including time- and facility-fixed effects.

Considering first the relationship between total Ombudsman complaints and total complaints to the DHSR (the first column of results in Tables 5 and 6), Ombudsman complaints in a quarter are more likely to significantly predict total DHSR complaints in a quarter, ceteris paribus, than DHSR complaints are to predict Ombudsman complaints in a quarter. When looking at the relationship between all DHSR complaints as the dependent variable and the Ombudsman complaint categories (Table 6), the relationships are all statistically significant and positive, with one
exception (financial complaints to the Ombudsman are negatively associated with total DHSR complaints). However, Table 5 shows that only total, mistreatment, and residents’ rights complaints by the DHSR are associated with total or substantiated Ombudsman complaints (as the dependent variable) when controlling for other factors that influence total Ombudsman complaints in a quarter. The relationship between overall levels of substantiated DHSR complaints

### Table 3. Association Between Long-Term Care Ombudsman Program Complaints per 100 Residents and Facility Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>All</th>
<th>Substantiated</th>
<th>Nutrition</th>
<th>Pharmacy</th>
<th>Quality of care</th>
</tr>
</thead>
<tbody>
<tr>
<td>For-profit</td>
<td>0.4666</td>
<td>0.4781</td>
<td>1.3395*</td>
<td>-13.4262**</td>
<td>0.0025</td>
</tr>
<tr>
<td>% Medicaid</td>
<td>0.3338</td>
<td>0.3136</td>
<td>-0.3033</td>
<td>1.1848</td>
<td>-0.2261</td>
</tr>
<tr>
<td>% Medicare</td>
<td>1.1753</td>
<td>1.2380</td>
<td>-2.0451</td>
<td>0.3241</td>
<td>1.7333*</td>
</tr>
<tr>
<td>Chain</td>
<td>-0.4994*</td>
<td>-0.4675*</td>
<td>-0.4509</td>
<td>-0.6000</td>
<td>-0.6180*</td>
</tr>
<tr>
<td>ADL index</td>
<td>0.1171</td>
<td>0.2451</td>
<td>1.0449</td>
<td>-1.9674</td>
<td>0.8037</td>
</tr>
<tr>
<td>Beds</td>
<td>0.0165</td>
<td>0.0201</td>
<td>-0.0077</td>
<td>-0.0086</td>
<td>0.0329</td>
</tr>
<tr>
<td>Obs (facils)</td>
<td>4,702 (347)</td>
<td>4,638 (342)</td>
<td>2,100 (154)</td>
<td>1,633 (119)</td>
<td>3,954 (291)</td>
</tr>
</tbody>
</table>

Physician        Administration        Residents’ rights        Environment        Financial
For-profit       -1.0285       -0.5292        2.5593*   16.4280** | 1.2101          |
% Medicaid       -3.2340       0.3359         2.9247    1.9930   | 1.3011          |
% Medicare       -2.6420       -1.5949        5.1689*   1.1231   | -2.3131         |
Chain            -1.1115       -0.3987        -0.3570   -0.5694  | -0.3520         |
ADL index        2.9344       -0.4524        1.1284    -4.4216* | -0.2663         |
Beds             0.0883       0.0476         0.0106    0.0051   | 0.0500          |
Obs (facils)     1,309 (96)  3,968 (291)    3,034 (222) | 1,897 (138) | 2,227 (162) |

*Note: ADL = activities of daily living.

Each set of coefficient estimates is for a different category of Ombudsman complaints. Results are from Poisson models that include facility- and time-fixed effects for each quarter in each year. ** and * indicate significance at the .01 level and .05 level, respectively, using robust standard errors. The sample used to estimate each model only includes facilities with at least one non-zero value for the dependent variable over the 16 quarters examined. Obs (facils) gives the number of observations over all quarters (Obs) and number of facilities (facils).

### Table 4. Association Between Division of Health Service Regulation Complaints per 100 Residents and Facility Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>All</th>
<th>Substantiated</th>
<th>Mistreatment</th>
<th>Quality of care</th>
<th>Resident assessment</th>
<th>Residents’ rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>For-profit</td>
<td>0.8882</td>
<td>0.7624</td>
<td>-13.73**</td>
<td>0.9825</td>
<td>0.9074</td>
<td>0.5953</td>
</tr>
<tr>
<td>% Medicaid</td>
<td>-1.3650</td>
<td>1.8156*</td>
<td>1.6525</td>
<td>1.6621</td>
<td>0.7615</td>
<td>0.7709</td>
</tr>
<tr>
<td>% Medicare</td>
<td>-0.4604</td>
<td>2.5167**</td>
<td>2.5553</td>
<td>3.3336**</td>
<td>0.6766</td>
<td>0.8400</td>
</tr>
<tr>
<td>Chain</td>
<td>-0.3276</td>
<td>-0.3847</td>
<td>0.5777</td>
<td>-0.1227</td>
<td>0.2354</td>
<td>-0.1177</td>
</tr>
<tr>
<td>ADL index</td>
<td>1.7530</td>
<td>2.0231*</td>
<td>-1.8064**</td>
<td>3.0341**</td>
<td>1.5476</td>
<td>-1.3364</td>
</tr>
<tr>
<td>Beds</td>
<td>-0.0024</td>
<td>0.0138</td>
<td>0.0080**</td>
<td>0.0031</td>
<td>-0.0051</td>
<td>-0.0089</td>
</tr>
<tr>
<td>Obs (facils)</td>
<td>5,070 (374)</td>
<td>4,163 (306)</td>
<td>1,385 (101)</td>
<td>3,083 (226)</td>
<td>863 (63)</td>
<td>2,627 (192)</td>
</tr>
</tbody>
</table>

Physician        Administration        Residents’ rights        Environment        Financial
Nutrition        Pharmacy        Environment        Administration        G-level or higher
deficiency
For-profit       -0.9162       3.5015**       1.2055       0.9004          | 0.1220            |
% Medicaid       0.3025        2.9786        -0.4408      2.4207          | 1.4531            |
% Medicare       -1.9062      3.7227         0.3261       2.6117          | 2.9691            |
Chain            -0.0243      -0.2392        0.1019       0.4916          | -0.4499           |
ADL Index        -0.6511      6.8397**       -0.7513      -1.1804         | 1.5850            |
Beds             0.0584       0.0305         0.0150       -0.0443         | 0.0161            |
Obs (facils)     817 (60)    1,091 (81)     2,550 (186)  1,707 (125)     | 2,187 (160)       |

Notes: ADL = activities of daily living.

Each set of coefficient estimates is for a different category of DHSR complaints. Results are from Poisson models that include facility- and time-fixed effects for each quarter in each year. ** and * indicate significance at the .01 level and .05 level, respectively, using robust standard errors. The sample used to estimate each model only includes facilities with at least one non-zero value for the dependent variable over the 16 quarters examined. Obs (facils) gives the number of observations over all quarters (Obs) and number of facilities (facils).
Table 5. Association Between Ombudsman and Division of Health Service Regulation (DHSR) Complaints: Dependent Variable Is Ombudsman Complaints*  

<table>
<thead>
<tr>
<th>Explanatory variable: DHSR complaints</th>
<th>All</th>
<th>Substantiated</th>
<th>Nutrition</th>
<th>Pharmacy</th>
<th>Quality of care</th>
<th>Residents' rights</th>
<th>Administration</th>
<th>Environment</th>
<th>Physician</th>
<th>Financial</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>2.34*</td>
<td>2.34*</td>
<td>2.95**</td>
<td>4.51**</td>
<td>2.61**</td>
<td>3.07**</td>
<td>2.96**</td>
<td>0.94</td>
<td>4.32**</td>
<td>-1.98*</td>
</tr>
<tr>
<td>Substantiated</td>
<td>0.85</td>
<td>0.85</td>
<td>2.28*</td>
<td>4.60**</td>
<td>0.74</td>
<td>1.28</td>
<td>1.13</td>
<td>1.22</td>
<td>0.81</td>
<td>-0.28</td>
</tr>
<tr>
<td>Mistreatment</td>
<td>2.60**</td>
<td>2.34*</td>
<td>2.34*</td>
<td>2.89**</td>
<td>2.79**</td>
<td>0.92</td>
<td>1.94</td>
<td>1.20</td>
<td>1.42</td>
<td>0.87</td>
</tr>
<tr>
<td>Quality of care</td>
<td>0.65</td>
<td>0.71</td>
<td>2.98**</td>
<td>5.88**</td>
<td>0.55</td>
<td>0.55</td>
<td>1.01</td>
<td>0.62</td>
<td>0.55</td>
<td>-1.31</td>
</tr>
<tr>
<td>Resident assessment</td>
<td>1.63</td>
<td>1.41</td>
<td>0.98</td>
<td>3.54**</td>
<td>2.13**</td>
<td>1.09</td>
<td>-0.35</td>
<td>2.34*</td>
<td>0.45</td>
<td>-1.04</td>
</tr>
<tr>
<td>Residents' rights</td>
<td>2.08*</td>
<td>2.23*</td>
<td>1.86</td>
<td>4.22**</td>
<td>1.38</td>
<td>1.94</td>
<td>0.48</td>
<td>3.66**</td>
<td>-1.21</td>
<td>-0.62</td>
</tr>
<tr>
<td>Nutrition</td>
<td>1.38</td>
<td>1.39</td>
<td>2.41*</td>
<td>1.33</td>
<td>1.41</td>
<td>1.12</td>
<td>3.99**</td>
<td>2.34*</td>
<td>1.74</td>
<td>-0.12</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>-1.04</td>
<td>-1.02</td>
<td>-0.19</td>
<td>1.67</td>
<td>-0.90</td>
<td>-0.26</td>
<td>-0.17</td>
<td>-0.88</td>
<td>0.28</td>
<td>1.49</td>
</tr>
<tr>
<td>Environment</td>
<td>0.22</td>
<td>0.23</td>
<td>1.35</td>
<td>-0.20</td>
<td>0.11</td>
<td>0.52</td>
<td>-0.36</td>
<td>0.21</td>
<td>1.42</td>
<td>0.76</td>
</tr>
<tr>
<td>Administration</td>
<td>1.83</td>
<td>1.86</td>
<td>0.22</td>
<td>1.35</td>
<td>2.10*</td>
<td>0.88</td>
<td>0.72</td>
<td>2.28*</td>
<td>0.01</td>
<td>0.87</td>
</tr>
<tr>
<td>G-level or higher def.†</td>
<td>0.92</td>
<td>0.87</td>
<td>0.45</td>
<td>3.20**</td>
<td>0.96</td>
<td>0.83</td>
<td>0.21</td>
<td>1.10</td>
<td>0.19</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Notes: *Both types of complaints are measured as complaints per 100 residents. Each cell represents the z-value from a Poisson model that includes facility- and time-fixed effects, where the z-value is based on the robust standard errors. The columns represent the dependent variable and the key explanatory variable is in the row. Other explanatory variables include all facility characteristics found in Table 3. ** and * indicate significance at the .01 level and .05 level, respectively. The sample used to estimate each model only includes facilities with at least one non-zero value for the dependent variable over the 16 quarters examined. See Table 3 for number of observations and facilities. Underlined values indicate matched categories from the Ombudsman and DHSR complaints.  
†Def is the abbreviation for deficiency.

(as the dependent variable) and Ombudsman complaints in the areas of quality of care, physician care, residents’ rights, administration, and financial are no longer statistically significant when only substantiated DHSR complaints are considered.

In many cases, it is possible to match a Ombudsman complaint category with a corresponding DHSR complaint category. The $z$-values for the matched categories are underlined in Tables 5 and 6. For instance, we can examine the association between Ombudsman complaints regarding nutrition with DHSR complaints regarding nutrition. For all matched categories, where statistically significant, there is always a positive relationship, as expected. Perhaps more interesting, we find a lack of statistical significance between many of the matched complaint categories (pharmacy, quality of care, residents’ rights, administration, and environment). This suggests that one type of complaints in a specific category to one agency are often not predictive of complaints in that same category to the other agency when controlling for other facility characteristics and time trends.

Discussion

Our research compares state certification agency (DHSR) complaints and Ombudsman complaints against NC nursing homes by considering (1) descriptive statistics regarding complaints, (2) facility-level predictors of complaints, and (3) associations between consumer complaints to the two agencies. These complaints have been understudied as a source of quality information, and our work provides a first look at the two sources of complaints simultaneously while also discussing the institutional detail regarding the different complaint generation mechanisms.

Although both agencies had more quality of care complaints than any other category, one key difference between the agencies is in substantiation rates. Nearly all Ombudsman complaints are substantiated, whereas only 48% of DHSR complaints are substantiated. The low substantiation rate is consistent with work by Stevenson (2006), who found the national average substantiation rate to be 38%, with wide variation across states. This low substantiation rate by the DHSR may be driven by the fact that the agency must meet a higher burden of proof in substantiating claims while also being less connected to facilities and residents than the Ombudsman.

We find significant relationships between some facility characteristics and both types of complaints. Our results mirror Allen and colleagues (2003), who did not find a significant effect of percent Medicaid on Ombudsman complaints in Connecticut. However, the proportion of Medicare residents in nursing homes seems to be important in explaining complaint volume to the DHSR and
As a higher proportion of Medicare residents is predictive of the volume of quality of care complaints (to both the DHSR and the Ombudsman) and residents’ rights complaints to the Ombudsman. In his consideration of investigated complaints to state certification agencies (analogous to DHSR), Stevenson (2006) also found a higher volume of complaints in nursing homes with more Medicare residents in a model with state (but not facility)-fixed effects. The short-stay nature of Medicare residents may mean that these residents and their families may have higher expectations than longer stay residents, who may become acclimated to the nursing home culture and lower their expectations (Bowers, 1988).

Results on the effect of for-profit ownership diverge from those of Allen and colleagues (2003) for total complaints to the Ombudsman and from those of Stevenson (2006) to state agencies similar to the DHSR, where both studies find more complaints for for-profit facilities and Stevenson (2006) finds more complaints for chains. In contrast, we find mixed results of for-profit status on complaint volume and no relationship between chain affiliation and complaint volume. This is likely due to the fact that neither of the prior studies used facility-fixed effects to control for facility characteristics that are constant for the period studied. In contrast, our results are identifying the effect of ownership type by considering within-facility changes in ownership, which are relatively uncommon. In addition, although average characteristics of NC homes are similar to national averages in many respects, NC does have a notably higher proportion of for-profit (81% NC vs. 65.9% nationally) and chain-affiliated homes (71.4% NC vs. 52.5% nationally; Harrington, Carrillo, & Woleslage Blank, 2007). The dominance of these organizational forms may change the environment in which all nursing homes operate, limiting our ability to generalize these results.

Several lingering questions regarding complaints as a consumer-oriented quality measure suggest avenues for future research. First, between states, the state certification agencies and Long-Term Care Ombudsman Programs may vary widely in their complaint substantiation processes, and future researchers should consider relationships between the two types of complaints for other states. Along similar lines, future research should consider the way that complaints are categorized by the Ombudsman relative to the categorization by the state survey agency. Second, the de-identified

### Table 6. Association Between Ombudsman and Division of Health Service Regulation (DHSR) Complaints: Dependent Variable is DHSR Complaints.

<table>
<thead>
<tr>
<th>Explanatory variable:</th>
<th>All Substantiated</th>
<th>Nutrition Substantiated</th>
<th>Pharmacy Substantiated</th>
<th>Quality of care Substantiated</th>
<th>Physicians Rights Substantiated</th>
<th>Administration Substantiated</th>
<th>Environment Substantiated</th>
<th>Financial Substantiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ombudsman complaints</td>
<td>6.28*** 2.11***</td>
<td>4.35*** 3.22***</td>
<td>2.36*** 3.08***</td>
<td>3.66*** 3.22***</td>
<td>4.87*** 3.87***</td>
<td>1.91*** 1.89***</td>
<td>2.24*** 2.09***</td>
<td>-2.6*** -2.6***</td>
</tr>
<tr>
<td>G level or higher</td>
<td>4.16*** 2.20***</td>
<td>2.68*** 2.77***</td>
<td>3.56*** 3.58***</td>
<td>2.31*** 2.34***</td>
<td>2.47*** 2.47***</td>
<td>1.70*** 1.70***</td>
<td>1.71*** 1.71***</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Nutrition</td>
<td>0.96** 0.18</td>
<td>0.56 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Pharmacy</td>
<td>1.91*** 1.89***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Quality</td>
<td>3.66*** 3.22***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Physician</td>
<td>4.87*** 3.87***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Admin</td>
<td>1.91*** 1.89***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Resident</td>
<td>3.24*** 3.24***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Environment</td>
<td>1.70*** 1.70***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
<tr>
<td>Substantial Financial</td>
<td>2.24*** 2.09***</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.36 0.22</td>
<td>0.22 0.22</td>
<td>0.22 0.22</td>
<td>-0.3 -0.3</td>
</tr>
</tbody>
</table>

Note: Both types of complaints are measured as complaints per 100 residents. Each cell represents the z-value from a Poisson model that includes facility- and time-fixed effects. The z-value is based on the robust standard errors. The columns represent the dependent variable and the key explanatory variable is in the row. Other explanatory variables include all facility characteristics found in Table 4. ** and * indicate significance at the .01 level and .05 level, respectively. The sample used to estimate each model only includes facilities with at least one non-zero value for the dependent variable over the 16 quarters examined. See Table 4 for number of observations and facilities for each complaint type. Underlined values indicate matched categories from the Ombudsman and DHSR complaints.
version of the data used for this study did not allow us to identify who initiated the complaint—the resident, the family, a staff member, the long-term care Ombudsman, or someone else. Unlike inspections, where the recording of quality data does not require consumer action, complaints require action on the part of the consumer or a concerned party. It would be instructive to consider the mechanisms behind complaint generation by studying who complains and how complaints differ across different initiators of complaints. Third, along similar lines, our findings regarding higher levels of complaint generation in facilities with more Medicare residents suggest that payer type and the length of stay in the nursing home may motivate complaint generation. Studying differences in complaints by payer type and across residents with different lengths of stay would allow researchers to understand more about the strengths and weaknesses of complaints as a quality indicator for nursing homes. Fourth, the fixed effects Poisson model estimates the relationship between complaints and other factors using facilities that have at least one complaint of the type being studied over the 16 quarters considered. This means that facilities with no complaints in any quarters are excluded from the sample when deriving the coefficient estimates and associations studied. Future researchers may wish to consider the effect of using a longer panel, which would allow for more opportunities for complaints that may be very rare in the best nursing homes. Finally, it would be instructive to study the relationship between traditional quality measures and complaints to both the DHSR and the Ombudsman.

Acknowledgments

We would like to thank the North Carolina Long-Term Care Ombudsman Program and the staff of the North Carolina Division of Health Regulation for providing complaint data. We would also like to thank the participants of the American Society for Health Economics Conference for useful feedback.

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