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Analyzing the effect of complaints, investigation of allegations, and deficiency citations on the quality of care in United States nursing homes (2007 – 2012)

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Analyzing the Effect of Complaints, Investigation of Allegations, and Deficiency Citations on the Quality of Care in United States Nursing Homes (2007 – 2012)

by

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DEDICATION

This dissertation is dedicated to my parents, Keith and Sheri Hansen. They have encouraged and pushed me to excel in all I do, have supported me without fail through all my endeavors, held my feet to the fire when necessary, put up with my ridiculous persona, and have set an excellent example of how to be good people in all they do – an example I try to meet and exceed each day. Thanks to my dad, Keith, for his gruff, surly advice and candid words when I need them most, for being stubborn as all hell and giving me a baseline on my own intractability, and for always being a sounding board against which to bang my head. Thanks to my mom, Sheri, for always taking my call and listening during times of stress, for threatening to injure those who get in my way, for a laugh and a dose of humor when needed most, and for always providing rational, sage words of wisdom. Without my parents, this graduate school endeavor, and many other ventures in life, would not be possible, and I am indebted to both of you.

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ABSTRACT

The quality of care in nursing homes has been evaluated from many varying perspectives, but few studies have analyzed quality in light of complaints made to state survey agencies by residents, their family members, or other individuals interacting with the nursing home. This study analyzed complaints, investigation of complaint allegations, and complaint-related deficiency citations to determine their effect, if any, on the quality of care in nationwide nursing homes. Using the Online Survey Certification and Reporting (OSCAR) survey dataset for facility characteristics and the complaint investigation dataset for outcomes of complaint investigation, analyses conducted included descriptives, correlations, conceptual mapping for complaint-related deficiencies, chi-square tests of independence, *t*-tests, and generalized estimating equations. At baseline, approximately 66% of nursing homes were for-profit and roughly 53% belonged to a chain membership, while the average percent of residents receiving Medicaid for care reimbursement was 60%. Results indicated that nursing homes differed significantly by profit status and chain membership on whether a complaint was received and whether a deficiency citation was issued following a complaint investigation. Additionally, certain facility and resident-aggregated characteristics, as indicated by odds ratios, were associated with an increase in the likelihood of receiving a complaint or a complaint-related citation. With respect to facility characteristics, for-profit nursing homes and those nursing homes belonging to a chain membership were found to have more complaints and more complaint-related deficiency citations than nonprofit nursing homes and non-chain facilities.

Resident-aggregated characteristics, such as a nursing home having more residents restrained, more residents with a catheter, or more residents with a diagnosis of depression, indicated a greater likelihood of receiving a complaint or complaint-related deficiency citation in longitudinal analyses. While additional research could aid in interpreting the effect of complaints on quality of care in nursing homes, study results indicate several facility and resident-aggregated factors that may aid in better understanding of quality of care and improve the training of surveyors and nursing home staff to improve quality of care for residents.

CHAPTER ONE:

INTRODUCTION

The care needs of residents in nursing homes continue to become more complex (Castle, 2008), with contemporary nursing homes primarily focusing on two types of residents: short-stay residents, who are often recuperating post-surgery or post-hospitalization (this segment of the nursing home population, and the care required for them, is often referred to as "post-acute"), and long-stay residents, who often come to a nursing home with a severe disability or who have sustained substantial declines in health upon admission. Nursing home residents who stay for greater periods of time are often more vulnerable to lapses in care because of deteriorations in physical health and cognitive impairment, and this includes an increased susceptibility to abuse and neglect (Castle, 2011; Dyer, Connoly, & McFeeley, 2002).

While there is an emphasis on reducing or preventing comorbidities, the nursing home population experiences higher levels of morbidity and impairment, by definition, than does the general population (Davis, 1991). Due to this increased vulnerability and the nature of oversight of the care delivered in nursing homes, it becomes increasingly important to assess and ensure the quality of nursing home care, being especially mindful of resident reports of their treatment via complaints about the quality of care received.

The existing research has called for more measures of quality, and more refined measures of quality, to aid in continual efforts to accurately assess and meaningfully improve the quality of care delivered in nursing homes. Lacking in most analyses of nursing home quality, to date, are

measures of complaints, complaint investigations and their effects on the delivery of care, the characteristics of nursing homes receiving complaints, the characteristics of nursing homes receiving substantiated complaints, and deficiency citations issued to facilities, regardless of what alleged conduct may have begun the complaint process.

The goal of this dissertation is to conduct analyses of complaints and investigations of complaints to assess how the complaint process contributes to the quality of care in nursing homes. The following dissertation provides background information relevant to the goals of this dissertation, as well as the posed research questions and hypotheses. Chapter Two provides a review of existing research into nursing home quality and the use of complaint investigations as a potential indicator of quality. The three investigated research questions, supporting hypotheses, measures, and analytic methods are included in Chapter Three. In Chapter Four, study results are reported for the three included research questions. Lastly, Chapter Five includes information on the significance of this research to the field of nursing home quality, limitations for the current study, and potential policy implications of this dissertation.

CHAPTER TWO:

BACKGROUND

This chapter starts with the current literature on nursing home quality, including differences in quality of care and quality of life. Following that, a discussion on measuring quality in nursing homes and the various aspects of quality explored in existing literature is included. Lastly, the complaint process and the process by which complaints are investigated is reviewed, with a discussion of the importance of including complaints and results of complaint investigations in analyses of nursing home quality.

Quality in Nursing Homes

According to Anderson, Hsieh, and Su (1998), based on configurational theory (see Meyer, Tsui, & Hinings, 1993), there is no single resident outcome measure that sufficiently captures quality of care, quality of life, or resource allocation. Quality of nursing home care is affected by many groups: residents, their families, staff and administration in a nursing home, policy makers, and more (Davis, 1991). Other studies have noted no single quality indicator, as well, but that there is an association between overall quality and numerous quality indicators (Castle, 2008, 2011), which might be obvious to note. This is merely evidence, however, that quality is multifaceted and affected by numerous factors present within a nursing home environment. Care delivered in nursing homes also, for many residents, occurs over a significant

period of time, and Davis (1991) suggests that the monitoring and assessment of care delivery can inform quality improvement efforts to improve resident life.

Research has indicated that, prior to admission, nursing home residents and their families often do not have sufficient information to make an informed choice on which facility to select based on quality of care issues (Spector, Selden, & Cohen, 1998). Certain initiatives have been pursued to remedy the lack of information, such as the Nursing Home Compare website, maintained by the Centers for Medicare and Medicaid Services (CMS), which compares a nursing facility against state and national averages for scores on the quality of care. These quality measure scores are largely based upon the nursing home quality measures that analyze facility performance in care delivery and resident outcomes (Arling, Lewis, Kane, Mueller, & Flood, 2007). Many of the measures shown on the Nursing Home Compare website are self-reported measures from nursing homes, however. In addition, research has centered around two aspects of nursing homes and the residents within: quality of care, primarily seen as the medical aspects of care delivery within facility-based settings, and quality of life, which focuses mostly on resident satisfaction with the quality of care received and perceptions of the residents' environment within the nursing home.

Quality of Care

Quality of care has been addressed in public policy initiatives for a substantial period of time. Quality of care standards were initially implemented in 1965 with the advent of the Medicare and Medicaid programs to ensure appropriate, tailored care is delivered to residents of U.S. nursing homes (Riportella-Muller & Slesinger, 1982). Nursing homes, however, have consistently failed to adhere to the care standards created in that legislation since its

implementation. To remedy persistent care concerns in nursing homes, Congress enacted sweeping reforms in 1987 of the regulations governing the operation of nursing homes that receive Medicare and Medicaid to reimburse the care of their residents, with additional legislation in subsequent years to continue to address quality of care in nursing homes (Walshe & Harrington, 2002). Research to date has attempted to identify indicators of quality that regulators and policy makers can focus upon to assist in the development of appropriate policy initiatives to remedy poor care for frail residents.

Quality of care in nursing homes is often analyzed using the proxy measure of deficiency citations a facility receives on its annual survey, both in quantity and severity of the deficiencies (Arling, Kane, Mueller, Bershadsky, & Degenholtz, 2007; Castle, 2002, 2011; Harrington, Mullan, & Carrillo, 2004). Upon receiving a citation, a nursing home may face a range of required responses depending on the findings of the state survey agency, such as developing a plan of correction to remedy the noted deficiency, being fined, being terminated from the Medicare or Medicaid programs, or a combination of these options (Castle, 2011). The remedy imposed upon each facility often depends on the scope and severity level the citation is assigned, ranging from "A" to "L," with "scope" encompassing the harm suffered by the resident and "severity" encompassing the number of residents in the facility affected by the cited deficiency (Castle, 2011). According to Harrington et al. (2004), in 1999 alone, 82% of U.S. nursing homes surveyed (N = 15,724) were assessed almost 85,000 deficiency citations for not meeting guidelines for operation, with approximately 80,489 complaints about care levied against this same group of nursing homes.

Some deficiency citations may be contingent on the nursing home's priorities and capabilities, including how those abilities and priorities are affected by profit status, chain

membership, or other structural factors (Castle, Wagner, Ferguson, & Handler, 2011). Other research has noted that for-profit nursing homes may attempt to reduce expenditures on resident care, often in the form of lower-quality staffing, which has the potential to increase the rate of adverse events and the amount and severity of deficiency citations issued (Comondore et al., 2009). However, in analyzing persistently poor-quality nursing homes as compared to consistently high-quality nursing homes (regardless of profit status), Grabowski and Castle (2004) found that, in analyses of four quality measures (i.e., pressure sores, physical restraints, feeding tubes, and indwelling catheters), those nursing homes that started as poor-quality facilities remained in poor quality status over a 10-year period of time, and the same was true for facilities that started as high-quality. Those facilities that were in states with a higher Medicaid reimbursement rate tended to start and remain as high-quality facilities (Grabowski & Castle, 2004), furthering the argument for necessary inclusion of care reimbursement factors in analyses of quality of care. With respect to chain membership, previous studies (e.g., Harrington et al., 2004) have indicated that nursing homes belonging to chains had higher percentages of deficiencies rated more severely (i.e., immediate harm or jeopardy to residents).

Nursing homes that employ a greater percentage of registered nurses (RNs) and certified nursing assistants (CNAs) among on-duty staff have been shown to deliver better quality of care (Anderson et al., 1998). Other studies, however, have noted that the structure, staff skill mix, and delivery of care more directly affect quality of care than merely having enough staff members on duty (Arling, Kane, et al., 2007; Castle & Ferguson, 2010; Davis, 1991). In a literature review of studies analyzing the relationship between staffing and quality of care measures, Castle (2008) found that 40% of the quality indicators were significantly, positively related to staffing levels. Unlicensed staff (e.g., CNAs) have been shown in certain studies to be

significantly related to restorative care (e.g., ADL training, toileting), which contributes to the quality of care given within a particular facility (Arling, Kane, et al., 2007). CNA staffing has also been shown to be a predictor of lower total deficiency scores within a nursing home and lower quality of care deficiency scores (Hyer et al., 2011).

Efforts to ensure quality have often been analyzed using resident outcomes as the variable of interest. A study of Texas nursing homes indicated that those facilities with the most optimal resident outcomes generally were nonprofit facilities, had a greater number of residents in the facility, and had more private pay residents (Anderson et al., 1998). Facilities that more frequently use physical restraints have been shown to either have a greater number of residents needing assistance with activities of daily living (ADLs) or a greater number of residents who had more severe cognitive impairment (Arling, Kane, et al., 2007).

Structural factors of nursing homes affect quality of care, as well. Multiple studies note differences in nursing home quality based on profit status, with for-profit nursing homes demonstrating poorer quality than their nonprofit counterparts (Amirkhanyan, Kim, & Lambright, 2008). Nonprofit nursing homes tend to be more patient-centered and tend to prioritize "medical and personal aspects of care," which has been theorized to promote higher quality for residents but may produce other operational inefficiencies (Amirkhanyan et al., 2008). Anderson et al. (1998) found that nursing homes with higher administrative costs and overall greater daily operating expenses had better resident outcomes, though these same facilities also had lower registered nurse salaries. In addition, reimbursement for care via the Medicaid program affects the quality of care in nursing homes, given the research indicating that nursing homes primarily reimbursed by this program tend to have more citations for resident abuse (Castle, 2011) and often provide care to more disadvantaged residents (e.g., residents in

impoverished areas, minority residents) (Mor, Zinn, Angelelli, Teno, & Miller, 2004). While approximately two-thirds of United States (U.S.) nursing homes are for-profit rather than nonprofit or government-operated, nonprofit nursing homes have been noted in the research as providing higher quality of care, especially with regard to certain quality measures (e.g., amount of staff members on duty, pressure sores) (Comondore et al., 2009).

Quality of Life

Nursing home quality of life has been characterized as distinct from the clinical care received by residents, even in studies attempting to document a relationship between quality of care and quality of life (Degenholtz, Kane, Kane, Bershadsky, & Kling, 2006). Donabedian (1988) argued for further analyses into the interaction between provider and patient (or, in nursing homes, staff and residents) to determine how staff-to-resident interactions affect resident health and welfare. Anderson et al. (1998) characterized nursing home quality of life indicators as a resident's functional ability, aggressive behaviors, and use of physical restraints in the facility. It has also been suggested that quality of life indicators have the ability to predict resident outcomes better than quality of care indicators as they "directly relate to residents' conditions" (Anderson et al., 1998).

While the Online Survey Certification and Reporting (OSCAR) survey dataset is not designed to capture resident quality of life directly, some research has attempted to use OSCAR variables to assess quality of life factors (Degenholtz et al., 2006). Information included in this dataset is primarily from assessment by others (e.g., surveyors inspecting facilities), rather than directly obtaining information from residents (Degenholtz et al., 2006). Additionally, resident characteristics, as opposed to facility characteristics, haven been demonstrated to better predict

quality of life in a particular nursing home, especially when residents maintained some functional abilities and had an engaging social environment (Shippee, Henning-Smith, Kane, & Lewis, 2013).

In addition, incidents of resident abuse in nursing homes affect quality of life beyond just concerns for resident health and safety (Castle, 2011; Jogerst, Daly, Dawson, Peek-Asa, & Schmuch, 2006). A study of staff members in German nursing homes found that 79% of nursing staff had indicated, in self-report questionnaires, they had abused (verbal abuse, in most instances) or neglected a resident and 66% observed maltreatment of residents by a co-worker but did nothing (Goergen, 2001). In addition, Castle (2011) noted that approximately 30% of nursing homes in the United States in 1999 and 2000 were cited for abuse of residents, using four abuse-related deficiency citations from the OSCAR survey data.

Such instances of abuse or neglect, while directly affecting resident quality of life, also affect life expectancy of vulnerable elder adults. Lachs, Williams, O'Brien, Pillemer, and Charlson (1998) found that, when comparing elders who had been maltreated to elders who were self-neglecting, the victims of maltreatment had poorer survival rates than those who were self-neglecting after 13 years of follow-up. Studying elder abuse victims, Schofield, Powers, and Loxton (2013) found that, among those participants who had experience maltreatment of some form, victims had increased levels of disability after suffering an incident of abuse, and elevated mortality of victims was associated with abuse incidents that involved coercion and feelings of dejection post-victimization. Research into the problem of elder abuse and neglect in facility-based settings continues to evolve and better address the complexities of addressing these forms of maltreatment (Lindbloom, Brandt, Hough, & Meadows, 2007), as well as working to ascertain the effect on resident quality of life after an instance of maltreatment. There are no

comprehensive data on the prevalence of abuse and neglect in long-term care settings, such as nursing homes, however (Teaster, Lawrence, & Cecil, 2007).

Resident Satisfaction

Nursing home resident satisfaction has been considered in some research as an appropriate measure of quality of life, and various researchers have attempted to create an instrument to measure this elusive concept. R. A. Kane (2003) argued that existing research supports inclusion of the resident's "voice" in ascertaining operational definitions for quality of life in nursing homes. Further studies in quality of life have found that facility-level factors (e.g., profit status, private vs. non-private rooms, location (urban vs. rural)) provide an opportunity to distinguish high-quality facilities from low-quality facilities based on resident self-reports of quality of life (R. L. Kane et al., 2004). In an attempt to better capture aspects of quality of life in nursing homes, CMS modified the Minimum Data Set (MDS), a tool designed to gain information on specifics of the health of and care delivered to nursing home residents, in 2010 to assess resident preferences and give residents a voice into the quality of their nursing home stay. Some states (e.g., Minnesota, Ohio) conduct additional surveys on resident and family satisfaction with care and services in a nursing home as a proxy for quality of care and quality of life, but this is not a uniform practice.

Measuring Aspects of Quality

Castle (2008) posits that quality of care variables primarily of interest include those within the constructs of process measures or outcome measures, using the Donabedian structure-process-outcome (SPO) model (Donabedian, 1988, 2005), which will be discussed more in-depth

in Chapter Three. In a literature review of 70 articles on quality of care, Castle (2008) identified that the primary indicators of quality used in these studies were deficiency citations, pressure sores, and the usage of physical restraints, but also that there were 302 quality indicators used in the literature, with 271 of these classified as either a process measure or outcome measure when utilizing the SPO model. There is, however, substantial variation in the quality of care given to nursing home residents, evidenced by the disparate levels and severity of deficiency citations issued to facilities (Grabowski & Castle, 2004). However, for nursing homes that consistently provide poor quality of care, residents in these facilities are at greater risk of harm (i.e., abuse) or neglect of care (Grabowski & Castle, 2004).

In analyzing quality of care, it has been suggested that there are often three main goals: 1.) care provided by the selected group to analyze (e.g., nursing home staff members); 2.) care received by the selected group to analyze (e.g., nursing home residents); and 3.) the capacity of providers to deliver the care to the resident (Donabedian, 2005). In a review of existing literature, Davis (1991) identified the primary quality indicators used for nursing home analyses as the size of the nursing home, financial costs for daily operations, staffing and staff composition, profit status, and reimbursement methodologies for care delivered (e.g., private pay, Medicare, Medicaid).

According to Cain and Mueller (2001), previous efforts to ensure quality care, using quality assurance as a focus, analyzed structural characteristics (e.g., number staff on duty, size of the nursing home) and process characteristics (e.g., composition of staff members within a facility, delivery of care). The shift in recent years has been toward quality improvement, instead of quality assurance, which often focuses more on resident outcome measures (e.g., no pressure sores developing, no decline in performance of ADLs) and is a “dynamic, ever-

changing process" (Cain & Mueller, 2001). With an increased emphasis on resident outcomes to improve quality, investigations into allegedly poor quality of care, voiced by complaints to state survey agencies, become more important to include in analyses of quality in nursing homes.

Complaint Investigations

The resident population in nursing homes is inherently more vulnerable to abuse, neglect, and the effects of poor quality of care due to diminished cognitive and physical states. Indeed, some nursing home residents may never improve in their abilities over time, and declines in health are not preventable in many cases, even with excellent care (Arling, Kane, et al., 2007). However, when deficient care exists in a facility, residents, family members of residents, facility staff, ombudsmen, or other professionals (e.g., social workers, law enforcement), may report inappropriate care to the state survey agency for further investigation. Typically, the complaint process can be depicted as shown in Figure 2-1 (*see* below). Figure 2-2 indicates the potential outcomes of a complaint investigation, while Figure 2-3 further depicts the investigatory process for complaints, indicating which process is followed depending upon the timing of when the complaint is received and the priority assigned to the complaint, based upon the conduct alleged by the reporter (*see* below for figures). Chapter Three will further explain the complaint process and information collected when a complaint is made to the state survey agency.

Figure 2-1. Complaint intake and investigation process. SSA = state survey agency. NH = nursing home. Following the occurrence of an event in a nursing home that generates a complaint to the state survey agency, the state survey agency staff assign a category to the complaint, based upon the improper conduct alleged (e.g., resident abuse, dietary, care or services) and a priority of the harm alleged: immediate jeopardy (IJ), non-IJ with a high potential to cause harm, non-IJ with a medium potential to cause harm, or non-IJ with low potential to cause harm. Non-IJ (low) may be included in the facility's subsequent annual survey. Following an investigation, the complaint is either substantiated or unsubstantiated, and a determination is made as to whether a deficiency citation will be issued.

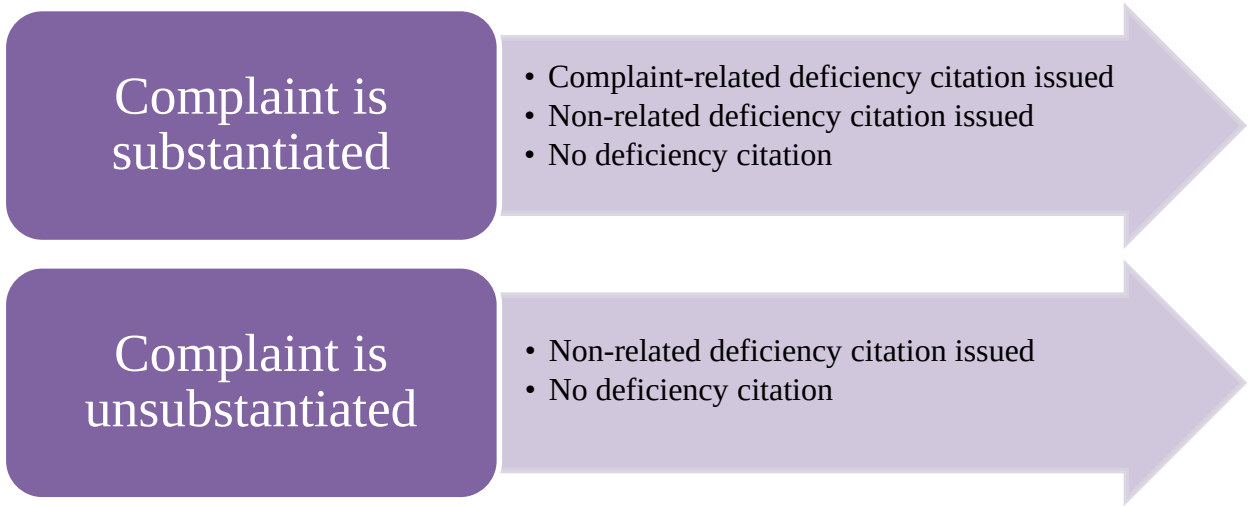

Figure 2-2. Potential outcomes of the complaint investigation process. The substance of the alleged improper conduct, following an investigation of the complaint, is either "substantiated" (the conduct occurred) or "unsubstantiated" (the findings were inconclusive or it was determined the conduct did not occur). Regardless of the finding, the survey agency can issue a deficiency citation for the complained-about conduct or for other deficiencies noted in the facility during the complaint investigation, which may or may not relate to the subject matter of the complaint.

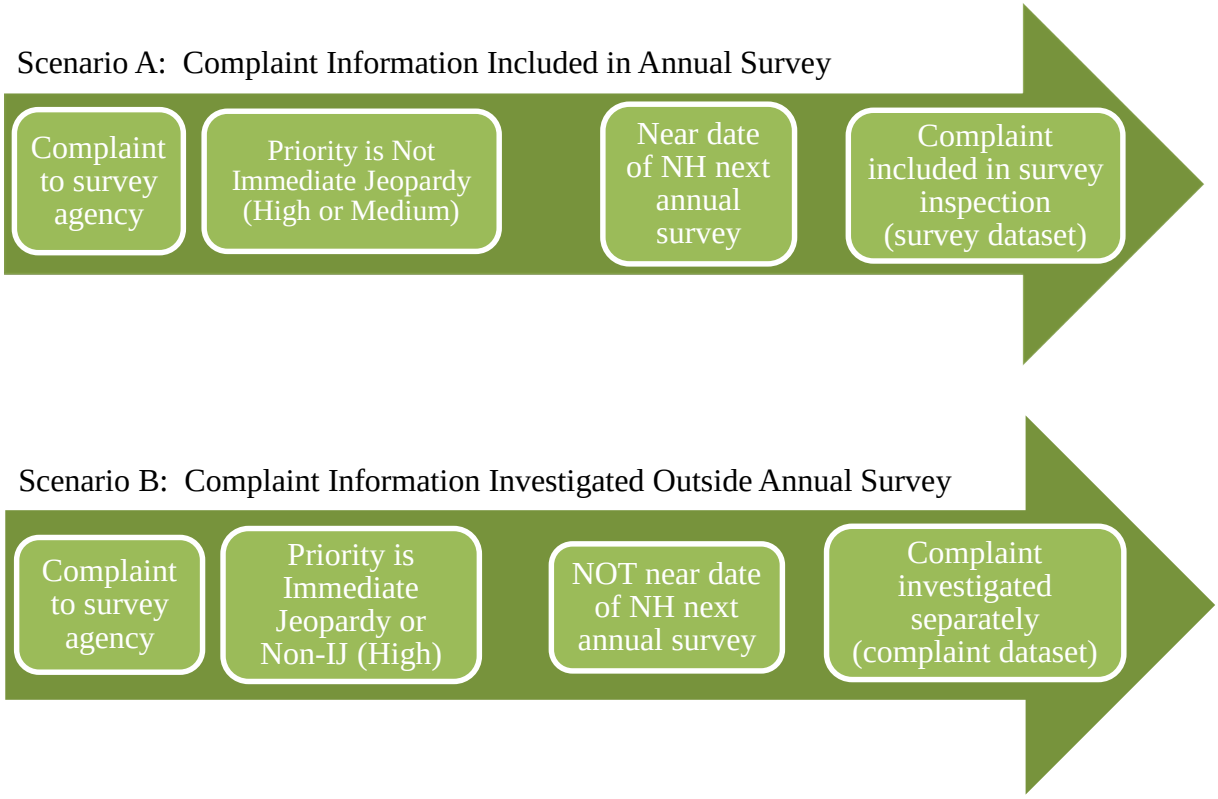

Figure 2-3. Decision criteria for investigating complaints independently or including the complaint as part of an annual survey. NH = nursing home. IJ = immediate jeopardy. Scenario A illustrates the process utilized when the complaint is received close in time to the nursing home's next annual (i.e., every nine to 15 months) survey is scheduled and is of a lower priority (i.e., the complaint does not allege immediate jeopardy to residents' health or safety). Scenario B illustrates the process utilized when the complaint is not received near the facility's next scheduled annual survey or when the complaint alleges immediate jeopardy to residents in the facility. Complaints alleging immediate jeopardy to resident health and safety must be investigated in two business days, those alleging conduct that has a high potential for resident harm but is not immediate jeopardy must be investigated within 10 business days, and complaints with a medium potential for harm (but also no immediate jeopardy) to residents must be investigated within 45 business days.

Some research has indicated that measures of quality, other than those that are aggregated (e.g., deficiency citations), have the ability to inform practitioners and policymakers about unique relationships existing within nursing homes that directly relate to the quality of care delivered in each facility (Castle, 2008), which has resulted in a call to use more outcome

indicators in efforts to assess and improve quality (Castle & Ferguson, 2010; Spector & Mukamel, 1998).

Given the level of cognitive and physical impairment commonly observed in nursing home residents, it may be tempting to some to assign a diminished value to the reports of abuse, neglect, or deficient care made by residents themselves. However, this assumption must be rejected, as research has demonstrated that 90% of older adults with abuse-related injuries are able to accurately report how the injury occurred, and this includes older adults with cognitive impairment, such as dementia or memory problems (Wiglesworth et al., 2009). This should be also be considered in light of research indicating that fewer than 25% of older adults with accidental injuries recall how they sustained the injury (Mosqueda, Burnight, & Liao, 2005).

Complaint data directly relates to the alleged abuse and neglect of nursing home residents. Previous research on abuse and neglect of residents found increases in mortality for those individuals suffering from these forms of maltreatment (Lachs et al., 1998; Ortmann, Fechner, Bajanowski, & Brinkmann, 2001; Schofield et al., 2013). Also, in a study of nursing homes from 2000 to 2007, Castle (2011) found that 26% of U.S. nursing homes received one of the four abuse-related deficiency citations. These cited nursing homes had a greater percentage of residents receiving Medicaid reimbursement for care delivered, the facilities had higher levels of residents with a diagnosis of dementia, and tended to have issued citations that had a higher scope and severity score (i.e., “J,” “K,” “L”) associated with assessed deficiencies (Castle, 2011).

Complaints as an Indicator of Quality

Much of the research into nursing home quality of care relies upon the annual (i.e., surveys occur every nine to 15 months for nursing homes receiving Medicare and/or Medicaid

reimbursement) survey data collected, which is facility-level data in the OSCAR survey dataset. The data contain aggregate resident information by facility (e.g., how many residents in a particular nursing home have dementia, how many residents receive antipsychotic medications) and is a regularly occurring process (i.e., occurring roughly every year). Three research studies to date (Stevenson, 2005, 2006; Troyer & Sause, 2011) have specifically analyzed the facility-level complaint data, which contains other variables than the survey dataset and is an off-time (i.e., irregularly timed) investigation, in analyses of quality of care or quality of life within nursing homes. Existing literature has also noted that regional differences exist in outcomes of annual surveys (e.g., issuance of deficiency citations to nursing homes, level of scope and severity of citations issued), largely due to facility and state factors that vary across the country (Harrington, Zimmerman, Karon, Robinson, & Beutel, 2000).

The existing research indicates that for-profit nursing homes are more likely to receive complaints from residents (Davis, 1991; Riportella-Muller & Slesinger, 1982), with one study indicating that for-profit nursing homes are almost twice as likely (IRR = 1.88) as nonprofit nursing homes to have resident complaints about quality of care (Stevenson, 2006). As might be expected, the Stevenson (2006) study found a positive association with a nursing home receiving a complaint and receiving deficiency citations on their annual surveys (complaints were predictive of a facility receiving a deficiency citation on a subsequent annual survey). Similar results were also reported by Stevenson (2005).

Analyzing 1998-2002 complaint data and OSCAR survey data, Stevenson (2006) evaluated associations between resident complaints, facility and resident characteristics, and nursing home quality measures. The average annual complaint rate was approximately 4.2 complaints per every 100 residents, with 40% of complaints received by state survey agencies

about quality of care and 24% of complaints regarding abuse or neglect (Stevenson, 2006). The majority of quality of care complaints (i.e., 39%) primarily originated from the resident or a family member of the resident (the complaint dataset treats both groups of people as one "source"). The study found that 35% of nationwide nursing homes had no complaints during the study period, 16% had at least one complaint, and 18% had five or more complaints (Stevenson, 2006). Nursing homes with higher RN and CNA staffing ratios were less likely to receive complaints, as well (Stevenson, 2005, 2006).

In a comparison analysis of OSCAR survey data, including complaint data, from North Carolina and investigatory data by the North Carolina long-term care ombudsman program, Troyer and Sause (2011) noted different rates of substantiation of complaints between the two agencies. This is somewhat expected, as the ombudsmen and survey agency have different functions and different goals (i.e., survey agencies can issue fines or deficiency citations and require plans of correction whereas the ombudsmen investigate resident rights and advocate on behalf of what the resident wants) when investigating resident complaints within nursing homes (Troyer & Sause, 2011). However, analyzing 2002-2006 OSCAR data, nursing homes with a higher percentage of resident care reimbursed by Medicare had higher complaint levels to the two agencies of interest, but the two agencies' investigations were not associated, demonstrating no duplication of investigatory effort (Troyer & Sause, 2011). For both agencies, the primary complaint revolved around quality of care issues.

While not directly on point, complaints of quality care have been analyzed in the context of hospital patients and provide helpful insight on approaches to including complaints in analyses of nursing home quality. Kline, Willness, and Ghali (2008) evaluated patients (n = 586) in Canadian hospitals who filed complaints and patients who did not file complaints (control

group), with the included predictors of patient safety culture of hospitals and characteristics of the individual patient (e.g., age, gender, primary diagnosis, care complexity for patient). Results, though not statistically significant, indicated that hospitals with more high-complexity cases tended to have more complaints about the quality of care, but that complaints were not related to the culture of patient safety in a particular care setting (Kline et al., 2008). Given the inherent complexity of care for nursing home residents, by definition, the implications of predictive value from this study could be statistically significant in a nursing home setting.

For conceptualizations of consumer choice for which product or service to purchase, the Hirshman (1970) concepts of "exit" and "voice" have been applied in the context of nursing home quality (e.g., Grabowski & Castle, 2004). Exit indicates that consumers dissatisfied with the quality of a product or service will no longer purchase it, and could be a small section of consumers of a product or service or a wide swath of consumers. Voice has been described as consumers complaining to the provider of the product or service, or its managerial leadership, about their dissatisfaction (Grabowski & Castle, 2004). In the context of nursing home care, it is much more difficult, if not impossible, for a resident to choose to exit a facility if he or she feels the facility is not meeting his or her unique care needs. Residents of assisted living facilities, who tend to function at higher cognitive and physical levels than many nursing home residents, have even been shown to have limited ability to relocate if displeased with their current facility (Teaster et al., 2007; Wood & Stephens, 2003). Nursing home residents with severe impairment may not be able to voice their concerns of quality to facility staff; often, for impaired residents, this duty falls upon family members or long-term care ombudsmen. However, when a resident or a family member does voice his or her dissatisfaction, this can manifest in the form of a complaint, which is subsequently investigated by a state survey agency.

The importance of including complaint investigations in analyses of quality is that, often, the complaints investigated by state survey agencies come directly from the residents who may be receiving poor care, may be abused or neglected, or may be displeased with other quality of life conditions present in their nursing home. Research has demonstrated, at least in one state, the effectiveness of combining complaint data with quality measures from OSCAR to comprehensively evaluate the quality of care delivered in a particular facility (Stevenson, 2005). Given the Hirschman concept of "exit" and how it is limited in the nursing home setting for a resident, the concept of "voice" becomes even more essential to listen to, to respond to, and to include in analyses of quality of care delivered to physically and cognitively impaired individuals.

Research Aims

Determining appropriate measures of quality of care within nursing homes has challenged researchers for a substantial period of time. The breadth of measures of quality to include, as well as the "quality" of the selected measures (e.g., Mor et al., 2003), have been debated in the existing literature. The measures selected for a study are largely dependent upon the question posed by the individual researcher, though some commonality exists among studies evaluating quality of care in nursing homes (e.g., feeding tube use, inappropriate use of restraints, catheter use). Despite the existing range of measures of quality, very few studies have analyzed quality in light of complaints or the results of complaint investigations regarding resident care and quality of life within nursing homes.

Complaints regarding quality of care are essential to include in analyses of nursing home quality. If complaints represent a departure from care standards established by the Federal rules

and regulations, then they have the potential to serve as a predictor for the issuance of deficiencies during the complaint investigation or on a subsequent annual survey (Stevenson, 2006). If complaints, instead, are representative of dissatisfaction of quality of life within a particular facility, this is important to recognize and determine the impact of what may be substandard quality on residents in that nursing home. Deficiency citations arising from complaint investigations, as argued by Stevenson (2006), are also especially valuable to consider due to their timing. While annual surveys have some regularity as to their timing or occurrence, complaints may be levied against a nursing home at any time. The deficiencies found in the complaint dataset represent the allegations that are investigated outside the regular annual survey process, which may catch a nursing home unaware of an investigation by state surveyors.

The limited literature on nursing home complaints indicates that the primary areas of quality evaluated during complaint investigations are in the areas of quality of care, abuse and neglect, residents' rights, and administration within a particular nursing home (Stevenson, 2006; Troyer & Sause, 2011). Given also that quality of care affects quality of life, it could be argued that improvements in quality of care, based upon analyses of complaint investigation data, may yield improvements in quality of life, as well. With over 1.5 million residents receiving care in approximately 17,000 United States nursing homes on any given day (Castle & Ferguson, 2010), it is important to evaluate departures from accepted standards of care, as indicated by voiced concerns over quality in nursing homes.

As mentioned previously, the Hirshman (1970) concepts of exit and voice should be considered with nursing home quality and complaints of care received. While the Hirshman model is an economic model for consumers purchasing a product (i.e., choice), there are applications in nursing home settings. There are often limited options for exit with nursing home

residents due to the availability of services and the frailty of the resident. Thus, optimizing the resident voice as much as possible, including complaint investigations to express dissatisfaction, becomes even more important. There is greater opportunity to exercise this consumer choice mechanism with the complaint process, especially given limitations on exit from the "service" with nursing homes.

Conceptual Framework

Quality, for purposes of the discussion launching the Donabedian structure-process-outcome (SPO) model, was defined to be the values and goals inherent to the system being analyzed and the values of society, to an extent, too (Donabedian, 2005). The SPO model posits that good or optimal structural conditions should yield good processes which, in turn, should produce good or optimal outcomes within a system (Anderson et al., 1998; Donabedian, 1988). Additionally, the SPO model has been characterized as more cyclical than linear, with positive or negative resident outcomes affecting structural and process variables over time in some cases (Marcus, Simkin, Rossi, & Pinto, 1996) (*see* Figure 2-4, below).

Donabedian (2005) defined structure as the characteristics or attributes of an organization or facility (e.g., number of staff members, profit status, chain membership) and Unruh and Wan (2004) further characterized structural variables as the facility's available resources to provide care. As previously discussed, pure compliance with structural variables does not guarantee that high quality of care is delivered in a particular nursing home setting (Davis, 1991). Process components of the SPO model are comprised of the factors inherent in the delivery of services, which is the delivery of care and services in the context of nursing home analyses.

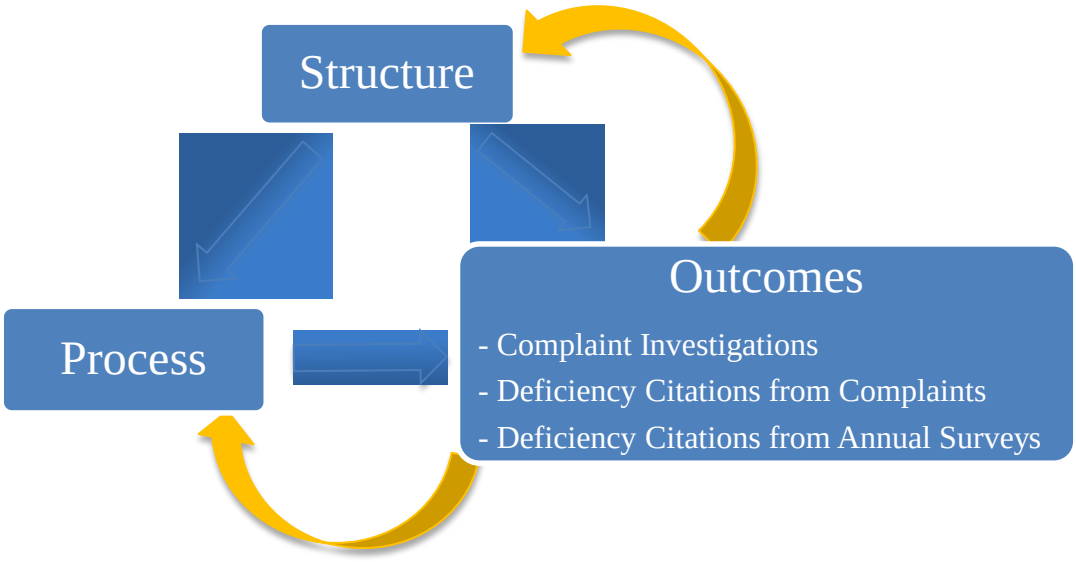

Figure 2-4. The Donabedian structure-process-outcome (SPO) model (blue arrows), incorporating complaint investigations and deficiency citations (from complaint investigations and annual surveys) as outcomes and as factors affecting the structures and processes of nursing homes (yellow arrows) over time. Complaint investigations, and deficiency citations issued from complaints, could reasonably serve as an indicator of quality of care within a nursing home.

This can include treatment given to residents, the composition of staff on duty (not merely the numbers of staff), and procedures within the facility to ensure optimal resident outcomes (Donabedian, 2005). Process variables also encompass money spent on caring for residents (Anderson et al., 1998) or usage of physical restraints on residents, psychotropic medications, and, sometimes, medication administration errors (Castle, 2008). These variables can include both clinical and non-clinical components of care delivery for residents (Unruh & Wan, 2004).

Outcomes of interest in using the SPO model vary by study interests and the question sought to be answered. While resident health outcomes (e.g., catheters, reduction in self-performance of ADLs, use of restraints) are often used to evaluate the care provided within the facility, deficiency citations are also used as a measure of quality to represent a deviation from

accepted standards of care delivery and quality of life within a nursing home. Multiple studies have used the SPO model to evaluate the quality of care within nursing home settings, but the model has yet to be utilized in analyses of complaint investigations as a proxy measure of quality. This study analyzes outcomes using deficiency citations issued to a nursing home as a result of a complaint investigation by state surveyors, as a proxy indicator for quality (*see* Figure 2-4).

Using the Donabedian SPO model to assess nursing home quality for the current study, Tables 2-1 (*see* below) and 3-1 (*see* Chapter Three) include the variables from the complaint dataset and the OSCAR survey dataset that are of interest for the analyses in this study. Adapting the variables used by Unruh and Wan (2004), contextual components that have the potential to affect the SPO model were included from both the complaint dataset and the OSCAR survey dataset, such as resident characteristics within the facility (e.g., percent of residents with dementia, percent of residents receiving Medicare for care reimbursement) and demographic factors (e.g., state, survey region). Table 3-2 includes variables from the two datasets for structure, process, and outcome variables of interest included in study analyses.

Table 2-1

Structure, Process, and Outcome Variables of Nursing Home Quality Incorporating Complaint Investigations

Category	Component	Available Data
Contextual Components (affecting the SPO structural components)	Location of complaint (e.g., survey region)	Complaint data
	Nursing home resident characteristics (e.g., % with dementia, % on antipsychotics)	OSCAR survey data
	Percent of residents receiving Medicare	
	Percent of residents receiving Medicaid	

Table 2-1 (continued)

Category	Component	Available Data
Structural Factors	Number of beds in nursing home Number of residents in nursing home Profit status Chain membership Average ADL ability of residents	OSCAR survey data
Processes	RN HPRD staffing LPN/LVN HPRD staffing CNA HPRD staffing Facility medical director FT/PT	OSCAR survey data
Outcomes	Whether a nursing home receives a complaint Frequency of complaints per nursing home Complaint investigation results (substantiation) Deficiency citations arising from complaints Deficiency citations arising from annual surveys Scope and severity (all deficiency citations)	Complaint data and OSCAR survey data

Note. SPO = structure-process-outcome (i.e., Donabedian model components). OSCAR = Online Survey Certification and Reporting database, which contains facility-level information collected approximately annually (i.e., every nine to 15 months) by state survey agencies from nursing homes receiving Medicare or Medicaid for resident care. ADL = activities of daily living. HPRD = hours per resident day. FT = full-time employee. PT = part-time employee. RN = registered nurse. LPN/LVN = licensed practical/vocational nurse. CNA = certified nursing assistant. Adapted from "A Systems Framework for Evaluating Nursing Care Quality in Nursing Homes," by L. Unruh and T. T. H. Wan, 2004, *Journal of Medical Systems, 28*(2).

To analyze nursing home quality and respond to the research questions posed below, five years of complaint investigation data and OSCAR survey data were used for the current study. Available for use are the complaint investigation data from years 2007-2012 and the OSCAR survey data from the same period. This five-year cluster of data allows for analyses of

differences among facilities on complaint investigation outcomes and differences among facilities on the types of complaints received.

While the studies to date analyzing complaint investigations have focused more so on state-level analyses, there has been some inclusion of facility-level characteristics associated with a complaint being made and with a subsequent deficiency citation on an annual survey following the complaint investigation. The current study uses nursing home complaints as the unit of analysis to determine the amount of complaints received on average, adjusted by the number of residents per state, and also the rates of substantiation of lodged complaints and whether deficiency citations are issued as a result of the investigation. In addition, this study also uses the nursing home as the unit of analysis to determine contemporaneous facility characteristics indicative of a complaint being lodged with a state survey agency, and distinguishes nursing home characteristics of those facilities receiving high numbers of unsubstantiated complaints as opposed to those facilities with a high number of substantiated complaints. Both Stevenson (2005) and Troyer and Sause (2011), using state-specific data, found that facilities with a greater percentage of Medicare reimbursement were more likely to get complaints than other nursing homes. One might speculate that facilities with a larger proportion of short-term residents (e.g., those receiving therapy or rehabilitation following a surgery) may receive more complaints because the residents are more cognitively intact, may have family members visiting who advocate for greater care, or who may resent the fact that post-surgery rehabilitation occurs in a nursing home.

The two datasets are described in greater detail later, but the complaint dataset captures information between a facility's annual surveys arising from allegations of improper care or misconduct within the nursing home. Allegations can come from the resident himself or herself,

family members of the resident, facility staff or former staff, an ombudsman, or the complainant can remain anonymous when making the report to the state survey agency. This dataset captures the alleged misconduct complained about, the number of complainant(s), the disposition of the complaint upon investigation (whether the complaint is substantiated or unsubstantiated), proposed follow-up action recommended by the surveyor conducting the investigation, and whether a nursing home received a deficiency citation as a result of a substantiated complaint.

New Contributions

This study suggests new methodological approaches to analyze complaint investigations as a proxy measure for nursing home quality. Stevenson (2005) presented associations between complaints and quality measures for state-level data, while Stevenson (2006) used intermittent complaint investigations to predict a subsequent deficiency citation on an annual survey with nationwide nursing home data. The current study suggests a different approach to evaluate results from nursing home complaint investigations over time (i.e., a five-year period from 2007-2012) to determine if certain nursing homes receive a multitude of complaints and, if so, the nature of those complaints and their disposition following an investigation by state surveyors. In addition, because hospital patients with complex conditions were found to complain more than non-complex patients (Kline et al., 2008), the current study analyzes complaints from nursing home residents, a population which is often comprised of medically complex persons, to determine if there is further information about those residents more susceptible to quality of care issues, and also abuse or neglect, to adapt meaningful policy initiatives to improve quality of life for this segment of older adults.

CHAPTER THREE:

METHODS

The following chapter describes the methods for this dissertation. The chapter begins with the objectives of the dissertation and the posed research questions and hypotheses. Following this, the data utilized in this study are described in detail, including the measures and variables to use from two datasets related to nursing home complaints and survey investigations. Lastly, the chapter concludes with analyses conducted to investigate each research question.

Objectives

This study assesses the quality of care provided in nursing homes using complaint investigations over a five-year period (i.e., 2007-2012), and the dispositions of these investigations, as a proxy measure of quality. As previously noted, this study builds upon the previous work of Stevenson (2006) by updating analyses of complaint data and proposing new methods of analyzing the effects of complaints and investigations of allegations. Using the complaint dataset and the Online Survey Certification and Reporting (OSCAR) survey dataset, analyses focus on identifying the differences among United States nursing homes with respect to complaints and citations issued following an investigation. Instead of analyzing complaint investigation results between two annual nursing home surveys as in Stevenson (2006), this study was designed to identify differences in facility characteristics (e.g., profit status, percentages of Medicare or Medicaid reimbursement, size) for nursing homes to determine

whether any characteristics may be indicative of a nursing home receiving a complaint, and also whether certain nursing homes are likely to receive a deficiency citation as a result of a complaint investigation. Further, analyses were structured to evaluate nursing homes over time to determine facility-level characteristics that may indicate improvement, based upon the number of complaints received during the study period. Given the longitudinal nature of the data included in this study, analyses also evaluate nursing homes with respect to complaints received to identify whether facilities cited with deficiencies as part of the complaint process improve or remain poor quality (i.e., receiving the same or greater quantities and severity of deficiency citations) over time.

Research Questions and Hypotheses

It has been shown that, over time, poor-performing nursing homes tend to remain poor performers and high-performing nursing homes tend to continue performing well (Grabowski & Castle, 2004). Other studies, however, have questioned the source behind the fluctuations in resident outcomes over time, noting the amount of resident turnover in many U.S. nursing homes and that some nursing homes are able to improve over time if they are dedicated to quality improvement and have effective facility leadership (Rantz et al., 2004). The persistent nature of quality performance over time stems from multiple sources, as noted in Grabowski and Castle (2004). While analyses of quality over time have focused on the traditional quality measures (e.g., catheter use, physical restraints, feeding tubes), lacking are analyses of complaints in nursing homes which evaluate the facility's performance over time on this measure. Stevenson (2006) utilized longitudinal analyses to determine if a complaint investigation indicated the issuance of a deficiency on a subsequent annual survey, but did not analyze the effects of

complaints and complaint-related deficiency citations within a particular nursing home over the study period. Given this information, the following research questions and hypotheses were developed for further analysis.

Research Question 1

What is the prevalence rate of complaints, substantiation of complaints, and the issuance of complaint-related deficiency citations for U.S. nursing homes? How do these rates vary by state and survey region?

Hypothesis 1. There will be a greater prevalence of complaint allegations in states that have more long-term care facilities (i.e., nursing homes).

Hypothesis 2. Survey region variability will be present in the complaint investigation dataset, similar to the OSCAR survey dataset, given the data are collected and created by the same group of individuals (i.e., state survey agency investigators).

Research Question 2

Do facility-level and resident-level characteristics of nursing homes affect the number of complaints in that facility, the substantiation of complaints, or the issuance of deficiency citations following a complaint investigation?

Hypothesis 1. Given that for-profit nursing homes tend to have more survey-related deficiency citations than their nonprofit counterparts, analyses should indicate that for-profit nursing homes will have a greater number of complaints and will also have a greater number of substantiated complaints than nonprofit nursing homes.

Hypothesis 2. Nursing homes with more Medicare-reimbursed residents will have more

complaints than nursing homes with greater percentages of other forms of care payment.

Hypothesis 3. Nursing homes with greater percentages of impaired residents will have fewer complaints than nursing homes with more cognitively and physically able residents.

Research Question 3

Does the complaint investigation process, including any issued citations to a nursing home as a result, effect change in the quality of care of nursing homes over time? How are complaint-related deficiencies associated with survey-related deficiencies?

Hypothesis 1. For-profit nursing homes with a greater percentage of Medicaid-reimbursed care, which is a lower reimbursement rate than either Medicare or private pay rates in most states, will be less likely to improve on the number of complaints and issued deficiency citations resulting from complaint investigations.

Hypothesis 2. Nursing homes with a greater percentage of Medicare-reimbursed care will be more likely to improve in quality over time as measured by complaint-related deficiency citations.

Data

To achieve the aims of this study and address the research questions posed, the data to use for analyzing nursing home quality in light of complaints are the data within the complaint investigation dataset. The complaint dataset information is entered by state survey agencies when a complaint is received from a nursing home resident or his/her family, an ombudsman, a facility employee or ex-employee, an anonymous reporter, or other professionals (e.g., law enforcement, county adult protective services). Data are entered both when a complaint is

received by state survey agency and at the completion of the investigation into the complaint, and includes the outcome of the investigation and whether a deficiency citation was issued to the nursing home. This study includes stand-alone, non-hospital-based nursing homes, representing about 96% of all nursing homes in the U.S. (Castle, 2011; Grabowski & Castle, 2004). This study omits hospital-based nursing homes due to the differences in the goals and delivery of care (Weech-Maldonado, Qaseem, & Mkanta, 2009).

For necessary facility and resident-aggregated characteristics of each nursing home, as well as deficiency citations from the annual survey process, the complaint dataset was paired with the OSCAR survey dataset. The OSCAR survey dataset contains information from each facility's annual (i.e., every nine to 15 months) survey of facility practices and resident care that is conducted by the state survey agency. In addition to demographic information (e.g., state, city, survey region in which the nursing home is located), the OSCAR dataset includes facility characteristics (e.g., profit status, chain membership, hospital-based) and resident-aggregated characteristics (e.g., percentage of residents with a dementia diagnosis, percentage of residents physically restrained). There is also data for payer source (e.g., Medicare, Medicaid); the deficiencies received by the nursing home on their annual survey (including the scope and severity of deficiencies issued); and full-time, part-time, or contract-based staffing levels of various occupations within each facility (e.g., registered nurses (RNs), licensed practical nurses (LPNs/LVNs), certified nursing assistants (CNAs), facility medical director). Both datasets contain a provider number, used for reimbursement purposes, and the state in which the facility is located. These two variables are necessary to merge the datasets, given that the provider number is not necessarily unique to a facility.

Measures

This study analyzes the differences between facilities, given the substantiation of complaints following an investigation and any deficiency citations issued as part of a substantiated complaint.

Table 3-1

Variables from the Complaint and OSCAR Survey Datasets for Study Analyses in Context of Donabedian Structure-Process-Outcome Components

SPO Component and Variable Names	Dataset Source
Structural Factors	
Profit status	OSCAR
Total number of residents in nursing home	OSCAR
Total number of beds in nursing home	OSCAR
Chain membership	OSCAR
Residents receiving Medicare for care	OSCAR
Residents receiving Medicaid for care	OSCAR
Resident council in nursing home	OSCAR
Family council in nursing home	OSCAR
Processes	
Registered nurse staffing	OSCAR
Licensed practical/vocational nurse staffing	OSCAR
Certified nurse assistant staffing	OSCAR
Medical director staffing	OSCAR
Outcomes	
Date complaint received	Complaint
Cycle visit date	Complaint
Allegation category code	Complaint
Allegation finding code	Complaint
Deficiency prefix code	Complaint
Deficiency tag number	Complaint
Scope and severity code	Complaint
Scope and severity code	OSCAR

Table 3-1 (continued)

SPO Component and Variable Names	Dataset Source
Total deficiencies on first survey date	OSCAR
Total deficiencies on second survey date	OSCAR
Total deficiencies on third survey date	OSCAR
Total deficiencies on fourth survey date	OSCAR
Deficiency citations (F-150 through F-522)	OSCAR
Contextual Components	
State name	OSCAR and Complaint
Survey region	OSCAR and Complaint
Residents with dementia diagnosis	OSCAR
Residents with depression diagnosis	OSCAR
Residents receiving antipsychotic medication	OSCAR
Residents receiving antidepressant medication	OSCAR
Residents physically restrained	OSCAR
Residents with indwelling/external catheter	OSCAR
Acuity index of nursing home residents	OSCAR

Note. SPO = structure-process-outcome (i.e., Donabedian model components).

Research has indicated that for-profit facilities, which belong to a chain and have a higher resident occupancy rate, were more likely to receive a complaint (Stevenson, 2006). Also, two of the previously-mentioned studies indicated that nursing homes with a greater percentage of residents receiving Medicare as a payer source were more likely to get complaints (Stevenson, 2005; Troyer & Sause, 2011). Medicare primarily funds the care in nursing homes for short-stay residents (e.g., post-acute care individuals receiving rehabilitation), and those nursing home residents who become long-stay residents have their care covered by Medicare for a period of time before Medicaid becomes the primary payer. These long-stay residents, if still having their care reimbursed by Medicare, may not have experienced a decline in health or cognition prior to

the payer instead becoming Medicaid. Thus, it seems important to analyze the resident composition within nursing homes that receive numerous complaints, whether substantiated or unsubstantiated, to determine differences between facilities.

The complaint dataset includes several variables utilized in the current study. Variables in the complaint dataset include those related to complaint investigation dates (i.e., dates when the complaint investigation began and when it concluded) and also dates for any required follow-up visit, depending on the results of the initial investigation. In addition, the complaint dataset contains a variable for an "allegation category," which is assigned to the complaint by the individual at the state survey agency who receives information on the complaint. From Stevenson (2006) and Troyer and Sause (2011), the most common categories assigned to complaints include resident care or services, abuse and neglect, administration at the particular nursing home, and residents' rights. Other allegation categories include patient dumping, environmental concerns, dietary complaints, misuse of resident funds or property, unqualified personnel, fraud or false billing, and more.

Corresponding to each of allegation category variable is an "allegation finding" variable, which is a dichotomous variable that shows whether the alleged conduct was substantiated or unsubstantiated upon investigation. There are also three variables indicating the recommended remedy when a nursing home is issued a deficiency citation, which can include a plan of correction, license revocation, termination from the Medicare and Medicaid program, civil monetary penalties, and more. Also, though it needs to be calculated (*see* Figures 2-1 and 2-3 in Chapter Two), the staff member taking the complaint at the state survey agency assigns a priority to the alleged misconduct, depending upon what the complainant alleges. The levels of priority include: 1.) immediate jeopardy (IJ) to resident health and safety (complaint must be

investigated within two business days); 2.) non-IJ with a high potential of harm to a resident (complaint must be investigated within 10 business days); 3.) non-IJ with a medium potential of harm to the resident (complaint must be investigated within 45 business days); and 4.) non-IJ with a low potential of harm to the resident (complaint may be investigated during the next annual survey) (Chapter 5 – Complaint Procedures, State Operations Manual, CMS, 2013).

The OSCAR survey dataset also includes facility aggregated resident-level variables (e.g., the number of residents with a dementia diagnosis in a particular nursing home, number with catheters, number receiving antipsychotic medication), derived from the facility's resident census during the annual survey process. From the OSCAR dataset, to account for the resident health status within a facility, the acuity index variable can be utilized as a measure of limitations to physical and cognitive health and self-performance of ADLs of those within a particular nursing home (Stevenson, 2006) (*see* Cowles, 2003 for further information on the calculation of the acuity score for each nursing home).

To perform the necessary analyses to evaluate the research questions posed in this study, three variables were created upon merging the two datasets. The first variable created was a count of the number of complaints each facility received in a given year. The second variable created was a dichotomous variable to indicate whether or not the nursing home has ever had a complaint over the five-year study period (i.e., 0 = no complaints, 1 = nursing home received at least one complaint). Lastly, the third variable created was dichotomous to indicate whether a nursing home, if getting a complaint, received a deficiency citation as a result of the complaint investigation (i.e., 0 = no deficiency citation issued, 1 = deficiency citation issued against the nursing home).

Additionally, a deficiency score was calculated for each facility for the complaint-related deficiencies and another deficiency score calculated for survey-related deficiencies. The deficiency score is calculated by giving a facility a set number of "points" for each deficiency citation issued in a given year. The deficiency score also accounts for the scope and severity of the citations, with more severe conduct receiving more points. Each citation is given a certain number of points, and additional points are given to a facility that receives the same citation in a subsequent year (*see* Hyer et al., 2011 for further information on the calculation of the deficiency score). To calculate a deficiency score for a nursing home for the complaint-related deficiencies, the F-Tag variables (one variable for the tag letter (e.g., "F") and one variable for the tag number (e.g., "226")) were transformed into 180 dichotomous variables for each facility to match the OSCAR survey dataset. To account for resident characteristics within each nursing home, the health characteristic (e.g., the number of residents with a dementia diagnosis in that nursing home) was divided by the total number of residents in each facility to calculate the percentages. This yielded resident-aggregated characteristics for each nursing home to include in study analyses.

The existing nursing home quality literature has indicated that relationships exist between structural factors and quality of care, and many studies control for facility- and resident-level covariates in longitudinal analyses (e.g., Grabowski & Castle, 2004). For this study, facility-level covariates utilized in longitudinal analyses included facility size (using the variable in the OSCAR survey dataset for the number of beds and total residents in a nursing home), profit status, survey region, and whether or not the nursing home belongs to a chain membership. Each nursing home's percentage of Medicare- and Medicaid-reimbursed residents were also included as covariates in analyses, as well as staffing levels of RNs, LPNs/LVNs, CNAs, and the facility

medical director, given their involvement in direct care and services for residents and their relationship in other studies to the incidence of complaints (Stevenson, 2006).

Resident-level covariates, aggregated at the facility level, included in analyses were those which reflect the ability of the residents to participate in care decisions and those which reflect the ability of the resident to lodge a complaint if he or she feels care or services are not appropriately provided. To create the percentage of residents in a facility with a certain condition (e.g., residents with a catheter, residents receiving antipsychotic medications, residents who are restrained), the number of residents with that condition was divided by the total number of residents in that particular facility to calculate the prevalence rate. Resident-level covariates included in analyses, from the OSCAR survey dataset, were the number of residents with a dementia diagnosis, number of residents with a depression diagnosis, those receiving antipsychotic medications, those receiving antidepressant medications, those with behavioral symptoms, and the acuity index of residents in a given nursing home, plus variables relating to the quality measures. A complete listing of measures utilized in this study can be found above in Table 3-1.

Analyses

The data utilized in this study are longitudinal in nature: five years of complaint investigation data and OSCAR survey data from years 2007-2012. Longitudinal studies, as compared to cross-sectional studies, usually have the advantages of "increased power and robustness to model selection" (Zeger & Liang, 1992). The complaint data provide useful information regarding complained-about conduct in a nursing home, the disposition of investigations, issued deficiency citations from the investigation, and the proposed action to

remedy the improper conduct. However, for facility characteristics and aggregate (by facility) resident characteristics, the complaint data need to be merged with the OSCAR survey data. Additionally, due to the availability of data, years were constructed as March to February (e.g., study year one was constructed as March 2007 through February 2008, study year two was March 2008 through February 2009). All analyses were performed using SAS 9.3 (SAS Institute, Inc., 2009).

Research Question 1

What is the prevalence rate of complaints, substantiation of complaints, and the issuance of complaint-related deficiency citations for U.S. nursing homes? How do these rates vary by state and survey region?

Analyses for Question 1. Frequency and descriptive analyses were conducted on the number of complaints in nationwide nursing homes, adjusted by number of residents per state. Additional descriptives were calculated, as well as nursing homes with and without complaints, substantiated and unsubstantiated complaints, and deficiency citations issued during the complaint investigation process. Pearson and Spearman correlations ($p < .05$ level) were run to identify any significant associations among the included variables. In addition, each category was analyzed in terms of substantiated complaint rates to determine if certain categories of alleged misconduct are more likely to have substantiated complaints than other categories. The prioritization levels of complaints were calculated using two date variables in the complaint dataset (i.e., "date complaint received," "cycle visit date") as the variable was not provided in the initial dataset. Once the priority levels were calculated, complaints were categorized within each of the priority levels.

As part of this question, issued deficiency citations were mapped onto the twenty potential categories into which the levied complaint could be placed. To do this, the state surveyor guidelines and federal regulations were utilized to determine which deficiencies best align with each category for the complaints.

Research Question 2

Do facility-level and resident-level characteristics of nursing homes affect the number of complaints in that facility, the substantiation of complaints, or the issuance of deficiency citations following a complaint investigation?

Analyses for Question 2. To identify and analyze differences between nursing homes, based upon the first variable created when merging the two datasets (i.e., whether a facility has received complaints and the disposition of those complaints), chi-square tests of independence and *t*-tests were utilized. Chi-square tests of independence are similar to the interaction term in an analysis of variance (ANOVA), and are used when the dependent variable is not normally distributed and scaled at the ratio or interval level (i.e., values are either 0, 1, 2, or 3) (Cronk, 2008). Given that multiple independent variables were of interest, this was also the appropriate test to determine how the independent variable relates to the complaints a facility may receive. Independent variables of interest for the current study, based upon previous work by Stevenson (2006) and Grabowski and Castle (2004), included nursing home profit status (for-profit vs. nonprofit); chain membership; percentage of Medicare and Medicaid reimbursement; number of beds; and staffing of RNs, LPNs/LVNs, CNAs, and facility medical directors. To address the other query posed in the third hypothesis for this research question, chi-square tests of independence and *t*-tests, depending upon the scaling of the variable, were conducted to

determine whether facilities differ on resident-aggregated characteristics related to the cognitive and physical functioning of residents in a nursing home, as well. To correct for inflated Type I error in conducting multiple *t*-tests, the Holm-Bonferroni method was employed in analyses (Holm, 1979).

Research Question 3

Does the complaint investigation process, including any issued citations to a nursing home as a result, effect change in the quality of care of nursing homes over time? How are complaint-related deficiencies associated with survey-related deficiencies?

Analyses for Question 3. Given that the variables of interest are both dichotomous (e.g., whether or not a facility receives a complaint) and count data (e.g., the number of complaints received for a facility each year), generalized estimating equations were utilized to evaluate a nursing home over time. Generalized estimating equations (GEEs), an extension of generalized linear models (GLMs), were selected for the current study due to the nature of repeat observations over time in nursing homes and the bias that can be present in repeat measures within the same facility (Zeger & Liang, 1992). For longitudinal analyses, GEEs are an appropriate methodology to employ for analyses of binary data, especially when the data are correlated in repeat observations from annual surveys or complaint investigations within a particular nursing home (Hanley, Negassa, Edwardes, & Forrester, 2003).

This type of analysis also allows for comparison of the unit of measure (here, the unit of measure is each nursing home) against itself over time, with the initial information for each facility serving as its baseline data for comparisons in later years. The GEE is also a robust method to address facilities that may not have a complaint at baseline, but then receive a

complaint in a subsequent year of the longitudinal analysis. The first two GEEs employed utilized dichotomous dependent variables (i.e., whether a nursing home receives a complaint, whether a nursing home receives a deficiency following a complaint investigation) with a logit link function. Usage of the logit link with the GEE analysis assumes a dichotomous dependent variable for mutually exclusive events (e.g., if a facility does or does not receive a deficiency citation during a complaint investigation) (Castle, 2011).

In addition, to evaluate the number of complaints in a nursing home over time and analyze the effect of the number of complaints on the number of deficiencies within each nursing home, a third GEE was used with the number of complaint-related deficiencies for each nursing home as the dependent variable. A log link with a Poisson distribution was used for this GEE, given that the dependent variable was both continuously scaled and positively skewed. The GEE also accounted for time-varying covariates (i.e., number of complaints per nursing home) to determine if, over time, the number of complaints received by a nursing home affected the number of complaint-related deficiencies issued to that nursing home.

When employing all GEE analyses, each facility was evaluated over time (during years 2007 – 2012) to determine whether, upon receiving a deficiency citation after a complaint investigation, that same facility received more complaints over the five-year study period (i.e., decreasing in quality or remaining stagnantly poor-performing) or improved (i.e., decreasing in the number of complaints and potentially increasing in quality). If the analyses of persistently poor- and high-performing facilities holds true from the quality measures used in the Grabowski and Castle (2004) study, the GEE analyses utilized here for complaint investigations and complaint-related deficiencies allow for a similar evaluation of performance over time using complaints in a specific nursing home and complaint-based deficiency citations for each facility.

CHAPTER FOUR:

RESULTS

This chapter details the results from study analyses. The first section reports descriptive results about states and frequency of complaints, survey region differences, descriptives on complaints and their substantiation, and information about deficiency citations resulting from complaint investigations. This is followed by baseline descriptives of nationwide nursing homes (from study year one) and differences among nursing homes on key study variables. Lastly, results from generalized estimating equations, including odds ratios, are reported.

Research Question 1

Descriptive Complaint and Deficiency Citation Characteristics

For the entire five-year study period, 305,390 (43.22%) of the allegations made to state survey agencies were substantiated upon completion of an investigation into the merits of the complaint. These results are reported in Table 4-1. Table 4-2 displays the frequency of complaints per nursing home by each year of the study. For the five years analyzed, on average, 23.28% of nursing homes had zero complaints, while 47.49% of nursing homes had five or more complaints on average.

The frequency of complaints and the substantiated complaint rate, by state, are described below in Table 4-3, to address the first hypothesis of this research question. The states with the

greatest number of complaints, adjusted by the total number of nursing home residents in that state, included Delaware, Indiana, Arizona, Vermont, and Texas, while the states with fewest number of complaints included Minnesota, South Carolina, Massachusetts, and New Jersey. The state with the highest complaint substantiation rate was South Dakota (83.13% of allegations substantiated) and the lowest substantiation rate was Rhode Island (22.41%).

Table 4-1

Complaints for Entire Study Period (2007 – 2012) by Resolution Status

	N	%
Substantiated	305,390	43.22
Unsubstantiated	401,206	56.78
Total	706,596	100.00

Note. Data for table derived from the complaint investigation dataset.

Table 4-2

Frequency of Alleged Complaints per Nursing Home by Year

Number of Complaints	2007	2008	2009	2010	2011	All Years (mean)	%
0	3,184	3,403	3,427	3,465	4,518	3,599	23.3
1	1,226	1,374	1,411	1,377	1,398	1,357	8.8
2	1,129	1,236	1,275	1,312	1,284	1,247	8.1
3	999	993	979	981	990	988	6.4
4	949	994	919	947	884	939	6.1
5+	8,527	7,687	7,528	7,410	5,782	7,387	47.5
Totals	16,014	15,687	15,539	15,492	14,856	15,518	

Note. NH = nursing home. Each observation is for a particular nursing home over a single study year. Data for table derived from the complaint investigation and OSCAR survey datasets.

Table 4-3

State Rates of Total Complaints per 100 Residents in Decreasing Order, Substantiated Complaints, and Substantiated Complaint Rates for Study Period (2007 – 2012)

State	Complaints/ 100 Residents/ Year	Residents (mean/year)	Complaints (all years)	Substantiated Complaints (all years)	Substantiated Complaint Rate (%)
Delaware	48.06	2,948.2	7,085	4,147	58.53
Indiana	29.77	32,420.0	48,252	25,332	52.50
Arizona	25.37	8,550.4	10,846	5,478	50.51
Vermont	24.40	2,493.8	3,042	1,055	34.68
Texas	23.82	83,650.8	99,611	28,540	28.65
Maryland	23.66	21,697.2	25,665	14,760	57.51
Maine	23.51	5,422.2	6,374	1,724	27.05
Kansas	22.39	12,972.2	14,521	7,510	51.72
West Virginia	22.16	5,698.0	6,314	2,584	40.92
Oklahoma	22.12	14,120.0	15,614	7,280	46.62
Iowa	21.61	20,278.0	21,911	10,283	46.93
South Dakota	21.08	382.4	403	335	83.13
Nebraska	19.80	9,472.8	9,380	4,766	50.81
Washington	19.01	13,723.2	13,047	6,228	47.74
Missouri	18.83	33,456.0	31,506	9,070	28.79
Utah	18.24	3,005.0	2,741	1,134	41.37
Colorado	18.16	9,749.0	8,850	5,632	63.64
Idaho	15.99	2,705.2	2,163	1,197	55.34
Alaska	15.97	365.6	292	161	55.14
Wyoming	15.85	1,368.2	1,084	577	53.23
Arkansas	15.81	14,959.4	11,828	5,595	47.30
Illinois	15.78	64,101.4	50,560	21,210	41.95
Louisiana	14.89	18,426.0	13,719	7,291	53.15
Michigan	13.02	35,110.4	22,865	15,459	67.61
Ohio	12.74	57,483.0	36,625	14,051	38.36
California	12.48	67,385.0	42,046	24,206	57.57
Tennessee	11.72	23,048.2	13,510	4,455	32.98
Oregon	11.42	5,305.0	3,029	1,641	54.18
North Carolina	10.77	31,249.2	16,821	4,518	26.86
Nevada	10.21	3,109.8	1,588	868	54.66
Georgia	10.15	24,125.4	12,242	3,036	24.80
Kentucky	10.01	18,142.4	9,083	4,218	46.44

Table 4-3 (continued)

State	Complaints/ 100 Residents/ Year	Residents (mean/year)	Complaints (all years)	Substantiated Complaints (all years)	Substantiated Complaint Rate (%)
Virginia	9.97	15,252.0	7,604	4,727	62.16
Montana	9.87	2,057.0	1,015	578	56.95
Florida	9.42	58,123.4	27,365	9,977	36.46
Connecticut	8.93	17,805.0	7,951	6,072	76.37
New Mexico	8.35	4,173.2	1,743	1,046	60.01
Alabama	8.13	13,791.0	5,605	2,675	47.73
Wisconsin	8.07	19,472.6	7,860	5,145	65.46
New Hampshire	7.75	4,214.2	1,632	1,247	76.41
North Dakota	7.36	1,600.8	589	278	47.20
Mississippi	6.93	13,180.8	4,569	2,403	52.59
Pennsylvania	6.88	62,748.8	21,595	8,066	37.35
New York	6.62	96,435.6	31,936	9,748	30.52
Hawaii	6.58	1,658.6	546	191	34.98
Rhode Island	5.29	7,015.6	1,856	416	22.41
New Jersey	5.10	39,731.2	10,131	3,790	37.41
Massachusetts	4.41	34,669.6	7,637	2,994	39.20
South Carolina	4.15	10,026.6	2,083	943	45.27
Minnesota	2.89	15,643.2	2,262	753	33.29
United States	13.3	1,064,523	706,596	305,390	43.22

Note. Substantiated complaint rate (%) calculated by dividing the number of substantiated complaints by the total number of complaints (per state). Data for table derived from the complaint investigation and OSCAR survey datasets.

Table 4-4 displays the breakdown of complaints, substantiated complaints, and substantiated complaint rates by the twenty potential complaint categories when first reported to the state survey agency. The category with the most complaints was “Care or Services” (32.37% of all complaints received), followed by “Other” (16.90%), “Resident Rights” (12.00%), and

"Resident Neglect" (11.99%). The category with the highest substantiation rate was "State Monitoring" (62.93%) and the category with the lowest substantiation rate was "Fraud or False Billing." See Appendix B for a listing of all potential allegation categories that could be selected when a complaint is received by the state survey agency.

To determine the potential differences between Centers for Medicare and Medicaid Services (CMS) nursing home survey regions, addressing the second hypothesis for this research question, similar to the Online Survey Certification and Reporting (OSCAR) data, frequency of complaints and substantiated complaint rates by survey region are reported in Table 4-5 (*see also* Appendix A for a map of the ten CMS survey regions). Table 4-5 also displays the number of states and number of nursing home residents in each survey region. There were significant differences among the ten survey regions on the substantiated complaint rates. For example, Region 2 had a significantly lower substantiated complaint rate than Regions 8 and 9, whereas Region 3 was only significantly different from Region 4. Additionally, both Region 4 and Region 8 were significantly different from six other regions.

In Table 4-6, the frequency of complaints and substantiated complaint rates are displayed according to the priority level assessed to the complaint. Confidence intervals (99%) are also reported to determine any differences in substantiation rate based upon the urgency of the complaint, as indicated by priority (*see* Chapter Three for further explanation of how priority levels were calculated). There were no significant differences in substantiated complaint rates among the three highest priority levels (i.e., Levels 1, 2, and 3) but all three of the highest levels were significantly different from the lowest priority level (i.e., Level 4).

Table 4-4

Number and Percent of Nursing Home Complaint Allegations for Entire Study Period (2007 – 2012) by Allegation Category

Allegation Category	Category Name	Complaints	%	Substantiated Complaints	Substantiated Complaint Rate (%)
1	Resident Abuse	78,597	11.12	30,963	39.39
2	Resident Neglect	84,742	11.99	31,313	36.95
3	Resident Rights	84,769	12.00	28,842	34.02
5	Environment	48,221	6.82	17,325	35.93
6	Care or Services	228,711	32.37	119,584	52.29
7	Dietary	29,463	4.17	9,185	31.17
8	Misuse of Resident Funds or Property	17,742	2.51	7,140	40.24
11	Falsification of Records	7,674	1.09	2,436	31.74
12	Unqualified Personnel	5,037	0.71	1,682	33.39
16	Fraud or False Billing	1,612	0.23	293	18.18
17	Fatality or Transfusion Fatality	7	0.00	2	28.57
18	Other	119,427	16.90	56,347	47.18
19	Life Safety Code	478	0.07	205	42.89
20	State Monitoring	116	0.02	73	62.93
	Totals	706,596	100.00	305,390	43.22

Note. Allegation category codes 4, 9, 10, 13, 14, and 15 had no complaints assigned during the five years of data analyzed for this study. These categories were omitted from this table (*see* Appendix B for all allegation categories that could be assigned to a complaint allegation). Data for table derived from the complaint investigation dataset.

Table 4-5

Complaints, Substantiated Complaints, and Substantiated Complaint Rates for Entire Study Period (2007 – 2012) by Nursing Home Survey Region

CMS Survey Region	Number of States	Mean Number of Residents	Total Complaints	Substantiated Complaints	Substantiated Complaint Rate (%)	99% CI
1	6	87,615	26,722	12,689	47.49	[44.02, 50.69]
2	2	145,563	39,951	12,937	32.38	[14.19, 47.76]
3	5	138,804	61,724	31,148	50.46	[40.53, 58.73]
4	8	233,193	84,157	29,997	35.64	[33.96, 37.08]
5	6	275,113	156,889	76,661	48.86	[45.04, 52.54]
6	5	150,654	134,100	46,521	34.69	[27.44, 41.61]
7	4	87,855	70,929	28,817	40.63	[36.47, 44.09]
8	6	37,428	12,821	7,377	57.54	[53.84, 61.89]
9	4	110,913	51,218	28,736	56.11	[50.20, 63.84]
10	4	28,672	17,181	8,549	49.76	[42.89, 57.13]

Note. CMS = Centers for Medicare and Medicaid Services. CI = confidence interval. *See* Appendix A for a map of the ten CMS nursing home survey regions. Data for table derived from complaint investigation and OSCAR survey datasets.

Table 4-6

Complaints, Substantiated Complaints, and Substantiated Complaint Rates for Entire Study Period (2007 – 2012) by Priority Level of Complaint

Priority Level	Number of Residents	Total Complaints	Substantiated Complaints	Substantiated Complaint Rate (%)	99% CI
1	569,330	53,801	19,151	35.60	[28.76, 41.55]
2	1,507,661	151,783	57,615	37.96	[32.01, 43.62]
3	2,201,674	288,806	120,467	41.71	[37.62, 45.45]
4	1,043,948	212,206	108,157	50.97	[47.80, 54.36]

Note. CI = confidence interval. Priority Level 1 = immediate jeopardy (IJ). Level 2 = non-IJ high. Level 3 = non-IJ medium. Level 4 = non-IJ low. Priority level was calculated using Centers for Medicare and Medicaid Services (CMS) State Operations Manual definitions and two date variables within the complaint investigation dataset.

Complaint-Related Deficiency Citations

To further analyze the quality of care from the perspective of complaints, descriptive characteristics of deficiency citations, following a complaint investigation, were calculated. Table 4-7 displays the top twenty most frequently issued deficiency citations following an investigation. Taken together, these twenty citations account for approximately 64% of all complaint-related citations issued during the study period. For contrast, Table 4-8 displays the top twenty most frequently issued deficiency citations issued during survey investigations, which are separate from complaint investigations and comprise approximately 56% of all survey-related citations used during the study period. As the two tables show, there is overlap in the complaint-related citations and the survey-related citations issued to nursing homes.

Table 4-7

Top Twenty Most Frequently Issued Deficiency Citations (F-Tags) from Complaint Investigations for Entire Study Period (2007 – 2012)

F-Tag	Citation Description	Number of Times Issued	% (all citations)
323	Accidents and supervision; environmental hazards	28,259	9.22
309	Quality of care	21,204	6.92
225	Proper background checks for NH staff members	15,493	5.05
281	Professional standards of quality	14,953	4.88
157	Resident notified of significant changes	14,537	4.74
514	Maintenance of resident clinical records	11,383	3.71
226	NH policies and practices for maltreatment	9,919	3.23
314	Pressure sores (ulcers)	9,908	3.23
279	Comprehensive care plans; use of assessments	8,999	2.93
282	Qualified individuals providing services in NH	7,700	2.51

Table 4-7 (continued)

F-Tag	Citation Description	Number of Times Issued	% (all citations)
312	Resident receives services for individual needs	7,644	2.49
241	Dignity in receiving care or services	6,954	2.27
253	Housekeeping and maintenance	5,983	1.95
425	Pharmacy services; medication for residents	5,429	1.77
272	Comprehensive resident assessments	5,088	1.66
280	Resident participates in care planning and treatment	4,832	1.58
315	Urinary incontinence	4,773	1.56
333	Residents free of significant medication errors	4,728	1.54
329	Residents not given unnecessary drugs	4,678	1.53
371	Food stored/prepared/served in sanitary conditions	4,705	1.53
	Totals	197,169	64.30

Note. NH = nursing home. Data for table derived from the complaint investigation dataset.

Table 4-8

Top Twenty Most Frequently Issued Deficiency Citations (F-Tags) from Survey Inspections for Entire Study Period (2007 – 2012)

F-Tag	Citation Description	Number of Times Issued	% (all citations)
371	Food stored/prepared/served in sanitary conditions	24,990	5.29
323	Accidents and supervision; environmental hazards	24,939	5.28
441	Infection control program in NH	19,282	4.08
309	Quality of care	19,201	4.06
281	Professional standards of quality	17,775	3.76
279	Comprehensive care plans; use of assessments	16,187	3.42
329	Residents not given unnecessary drugs	13,819	2.92

Table 4-8 (continued)

F-Tag	Citation Description	Number of Times Issued	% (all citations)
253	Housekeeping and maintenance	12,463	2.64
514	Maintenance of resident clinical records	11,817	2.50
315	Urinary incontinence	11,733	2.48
314	Pressure sores (ulcers)	11,548	2.44
241	Dignity in receiving care or services	11,530	2.44
431	Labeling and storage of drugs/biologicals in NH	11,156	2.36
282	Qualified individuals providing services in NH	9,864	2.09
425	Pharmacy services; medication for residents	8,995	1.90
272	Comprehensive resident assessments	8,551	1.81
280	Resident participates in care planning and treatment	8,523	1.80
312	Resident receives services for individual needs	8,128	1.72
465	Safe/functional/comfortable/sanitary environment	7,647	1.62
225	Proper background checks for NH staff members	7,613	1.61
	Totals	265,761	56.22

Note. NH = nursing home. Data for table derived from the OSCAR survey dataset.

In addition, Appendix C displays the frequency at which each of the 175 deficiency citations was issued during the study period following a complaint investigation. Deficiency citations issued to nursing homes are also broken down by allegation category and year in Table 4-9. Some categories had no deficiency citations issued following an investigation (e.g., “Fatality or Transfusion Fatality”), while the “Care or Services” category had approximately 19,000 citations for all nursing homes, on average. This category alone accounts for 31.2% of complaint-related citations issued.

Table 4-9

Deficiency Citations (F-Tags) Issued to United States Nursing Homes After a Complaint Investigation, by Year and Allegation Category

Assigned Allegation Category	2007	2008	2009	2010	2011	Total per Category
Resident Abuse	7,907	6,272	6,085	5,723	4,017	30,004
Resident Neglect	9,383	7,845	8,321	7,731	5,790	39,070
Resident Rights	9,584	7,398	6,984	7,030	5,492	36,488
Environment	6,095	4,695	4,121	4,283	3,069	22,263
Care or Services	24,487	20,170	18,887	18,212	13,928	95,684
Dietary	4,075	3,359	2,717	2,536	1,873	14,560
Misuse of Resident Funds or Property	1,880	1,773	1,628	1,475	1,113	7,869
Falsification of Records or Reports	903	834	866	756	685	4,044
Unqualified Personnel	822	504	548	395	384	2,653
Fraud or False Billing	273	159	160	115	55	762
Fatality or Transfusion Fatality	0	0	0	0	0	0
Other	13,664	10,946	10,475	10,115	7,809	53,009
Life Safety Code	91	45	20	14	13	183
State Monitoring	32	0	2	4	1	39
Totals	79,196	64,000	60,814	58,389	44,229	306,628

Note. Data derived from the complaint investigation dataset.

Mapping of Complaint Deficiencies and Allegation Categories

To analyze whether the complaint-related deficiency citations issued to nursing homes align with the complaint category assigned when the state survey agency first receives a grievance, citations were mapped to allegation categories for all substantiated complaints. Using the Federal regulations and the American Health Care Association (AHCA) Long-Term Care Survey Guide (November 2012 edition) as a guide, deficiency citations were assigned to an allegation category based on the subject-matter of the citation. Additionally, citations were grouped as "directly-related" and "broadly-related" to the allegation category. Results are reported in Table 4-10. There were no deficiency citations issued during the study period when the "Other" category was assigned, so that category is listed as "N/A" (i.e., not available) in the table.

As shown in Table 4-10, there were no citations issued when the "Fatality or Transfusion Fatality" category was selected, so that category is listed as "no data." Some allegation categories had a minimal number of citations mapped (e.g., "State Monitoring") whereas others had a multitude of citations mapped (e.g., "Care or Services"). For directly-related citations that were mapped, the highest percent of citations aligning with the mapped category was for "Care or Services," where 42.31% of directly-mapped citations were issued in this category. For broadly-related citations, "Care or Services" also had the highest percent of alignment of the issued citations within that category (36.09%). Additionally, there were categories where no broadly-related citations were mapped due to not having enough information from either the Centers for Medicare and Medicaid Services State Operations Manual, the Federal regulations for surveys and inspections of nursing homes, or the AHCA Survey Guide.

Table 4-10

Conceptual Mapping of Allegation Categories and Deficiency Citations: Deficiency Citations (F-Tags) Issued Following a Substantiated Complaint Allegation

Complaint Allegation Category (Code for Category)	Directly-Related Mapped Citations	Directly-Related Citations Issued per Category (%)	Broadly-Related Mapped Citations	Broadly-Related Citations Issued per Category (%)	Combined Mapped Citations (%)
Resident Abuse (01)	221, 222, 223, 224, 225, 226	24.82	155, 157, 165, 323, 329, 332, 333, 353, 354, 493, 520	16.69	41.51
Resident Neglect (02)	221, 222, 223, 224, 225, 226, 323, 353, 354	23.92	152, 252, 254, 279, 309, 311, 312, 314, 315, 317, 325, 317, 329, 332, 333, 385, 386, 494, 501, 520	24.99	48.91
Resident Rights (03)	150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177	10.87	201, 203, 206, 207, 242, 280	5.75	16.62

Table 4-10 (continued)

Complaint Allegation Category (Code for Category)	Directly-Related Mapped Citations	Directly-Related Citations Issued per Category (%)	Broadly-Related Mapped Citations	Broadly-Related Citations Issued per Category (%)	Combined Mapped Citations (%)
Environment (05)	252, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469	7.82	253, 254, 256, 257, 258, 323	15.09	22.91
Care or Services (06)	272, 279, 282, 309, 310, 311, 312, 314, 315, 317, 319, 320, 323, 325, 327, 329, 332, 333, 353, 354, 385, 386, 520	42.31	155, 157, 163, 164, 176, 207, 221, 222, 223, 224, 225, 226, 240, 241, 242, 245, 248, 250, 251, 252, 254, 273, 274, 275, 276, 278, 280, 281, 283, 284, 285, 286, 387, 388, 389, 441, 493, 494, 495, 497, 501, 514	36.09	78.40
Dietary (07)	360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 371, 372, 373	14.07	162, 321, 322, 325, 327, 464	2.85	16.92

Table 4-10 (continued)

Complaint Allegation Category (Code for Category)	Directly-Related Mapped Citations	Directly-Related Citations Issued per Category (%)	Broadly-Related Mapped Citations	Broadly-Related Citations Issued per Category (%)	Combined Mapped Citations (%)
Misuse of Resident Funds/Property (08)	159, 162, 224	4.41	160, 161	0.61	5.02
Falsification of Records or Reports (11)	153, 278, 514, 515, 516	9.95	173, 203, 206	0.59	10.54
Unqualified Personnel (12)	225, 251, 282, 390, 493, 494, 495, 499	11.84	385, 407, 496, 497, 498	2.20	14.04
Fraud/False Billing (16)	156, 162, 514	6.82	153, 154	0.26	7.08
Fatality/Transfusion Fatality (17)	309, 311, 323	No data	157, 221, 222	No data	No data
Other (18)	N/A	N/A	N/A	N/A	N/A
Life Safety Code (19)	454, 455, 456, 459, 463, 466	5.47	N/A	0.00	5.47
State Monitoring (20)	491, 492, 520	0.00	N/A	0.00	0.00

Note. Directly-related and broadly-mapped citations are those citations (F-Tags) expected for each indicated category, following a substantiated complaint within that category. Mapped citations for each category are based on the Federal regulations and consultation of the American Health Care Association Long-Term Care Survey Guide (November 2012 edition). Data for table derived from the complaint investigation dataset.

Research Question 2

Between-Facility Differences on Complaints and Cited Deficiencies

Baseline facility characteristics and resident characteristics (aggregated by facility) of nationwide nursing homes for the first study year (2007 – 2008) are presented in Table 4-11. Approximately 67% of nursing homes included in analyses were for-profit and roughly 53% were part of a chain membership. The average nursing home occupancy rate was 83%, with the average percent of residents receiving Medicaid to reimburse care was 60% and the percent of residents with care reimbursed by Medicare at 15%. For resident-aggregated characteristics, the average percent of residents with a psychiatric diagnosis was 21% and the average percent of residents with a diagnosis of dementia was 46%. With respect to medication, on average, 25% of nursing home residents were receiving an antipsychotic medication whereas 48% were receiving an antidepressant medication.

Table 4-11

Baseline Facility and Resident-aggregated Characteristics (2007 – 2008) of all United States Nursing Homes (N = 15,923)

Facility Characteristics	*M* (SD) or %
For-profit	66.86
Chain Membership	52.99
Total Number of Residents	89.41 (58.86)
Total Number of Beds	108.32 (67.98)
Occupancy Rate	0.83 (0.18)
Percentage of Residents with Medicare	0.15 (0.17)
Percentage of Residents with Medicaid	0.60 (0.24)
Acuity Index for Residents	10.16 (1.62)
Average ADL Score of Residents	3.94 (0.60)

Table 4-11 (continued)

Facility Characteristics	*M* (SD) or %
Presence of Resident Council	94.66
Presence of Family Council	35.66
RN Staffing (HPRD)	0.53 (2.66)
LPN/LVN Staffing (HPRD)	1.02 (1.77)
CNA Staffing (HPRD)	2.69 (6.87)
Medical Director (FT and PT)	0.03 (0.28)
Deficiency Score (Surveys)	66.52 (100.12)
Deficiency Score (Complaints)	77.21 (278.33)
Resident-aggregated Characteristics	***M*** **(SD) or %**
Percent of Residents with Psychiatric Diagnosis	0.21 (0.18)
Percent of Residents with Behavioral Issues	0.29 (0.19)
Percent of Residents with a Catheter	0.07 (0.06)
Percent of Residents Physically Restrained	0.05 (0.08)
Percent of Residents on Antipsychotic Medication	0.25 (0.15)
Percent of Residents on Antidepressant Medication	0.48 (0.14)
Percent of Residents with Dementia Diagnosis	0.46 (0.19)
Percent of Residents with Depression Diagnosis	0.49 (0.22)

Note. ADL = activities of daily living. RN = registered nurse. LPN/LVN = licensed practical/vocational nurse. CNA = certified nursing assistant. HPRD = hours per resident day. FT = full-time employee. PT = part-time employee. Data for table derived from the complaint investigation and OSCAR survey datasets.

To address the first hypothesis for this research question, chi-square analyses revealed significant differences between for-profit and nonprofit nursing homes, as well as between nursing homes belonging to a chain membership and those that did not belong to a chain. There were statistically significant differences at baseline (2007 – 2008) between chain membership nursing homes and non-chain nursing homes on whether the nursing home received a complaint during the study period (χ^2 (1) = 139.09, $p < .001$) and whether the nursing home received a complaint-related deficiency citation (χ^2 (1) = 152.41, $p < .001$). Additionally, significant

differences were found between for-profit and nonprofit nursing homes on whether the nursing home received a complaint (χ^2 (1) = 850.37, $p < .001$) and whether the nursing home received a complaint-related deficiency citation (χ^2 (1) = 453.01, $p < .001$).

To further analyze between-facility differences and evaluate the second and third hypotheses for this question, multiple *t*-tests were conducted for differences between nursing homes on whether a complaint is made and whether a nursing home receives a deficiency citation following a complaint investigation. Table 4-12 displays the between-facility differences as to whether a complaint is made. Table 4-13 displays the between-facility differences as to whether a nursing home receives a citation following a complaint investigation.

As shown in Table 4-12, nursing homes without complaints were significantly different than nursing homes with complaints on all comparison variables. Nursing homes with complaints had a greater number of residents ($t(15,921) = -33.14$, $p < .0001$), fewer residents receiving Medicare ($t(15,921) = 17.74$, $p < .0001$) and more receiving Medicaid ($t(15,921) = -27.37$, $p < .0001$), and a higher deficiency score ($t(15,921) = -14.36$, $p < .0001$) than did nursing homes without complaints. Given the large sample size in this study, effect sizes are also reported in Tables 4-12 and 4-13.

Additionally, Table 4-13 shows nursing homes receiving a complaint-related deficiency were significantly different than nursing homes with no complaint-related deficiency on many, but not all, comparison variables. Nursing homes receiving a complaint-related deficiency, also, had a greater number of residents ($t(15,921) = -21.17$, $p < .0001$), fewer residents receiving Medicare ($t(15,921) = 9.40$, $p < .0001$) and more receiving Medicaid ($t(15,921) = -18.04$, $p < .0001$), and a higher deficiency score ($t(15,921) = -21.30$, $p < .0001$) than nursing homes without a complaint-related deficiency citation.

Table 4-12

Baseline Facility and Resident-aggregated Characteristics (2007-2008): Differences between Nursing Homes on Whether a Complaint is Made

	M (SD)					
Facility Characteristics	NHs with Complaints	NHs without Complaints	*t*	DF	*d*	*p*
Total Number of Residents	96.88 (59.79)	59.50 (43.69)	-33.14	15,921	-0.53	< .0001
Total Number of Beds	117.10 (69.13)	73.24 (49.56)	-33.70	15,921	-0.53	< .0001
Occupancy Rate	0.83 (0.17)	0.81 (0.22)	-5.54	15,921	-0.09	< .0001
Percentage of Residents with Medicare	0.14 (0.13)	0.20 (0.28)	17.74	15,921	0.28	< .0001
Percentage of Residents with Medicaid	0.63 (0.21)	0.50 (0.30)	-27.37	15,921	-0.43	< .0001
Acuity Index for Residents	10.24 (1.56)	9.85 (1.82)	-12.43	15,921	-0.20	< .0001
Average ADL Score of Residents	3.95 (0.59)	3.92 (0.62)	-2.99	15,921	-0.05	.0081
Deficiency Score (Survey Deficiencies)	72.18 (106.40)	43.87 (64.53)	-14.36	15,921	-0.23	< .0001
Resident-aggregated Characteristics						
Percent of Residents with Psychiatric Diagnosis	0.22 (0.18)	0.18 (0.17)	-13.14	15,921	-0.21	< .0001
Percent of Residents with Behavioral Issues	0.29 (0.18)	0.27 (0.20)	-5.74	15,921	-0.09	< .0001
Percent of Residents with a Catheter	0.06 (0.06)	0.07 (0.09)	7.58	15,921	0.12	< .0001
Percent of Residents Physically Restrained	0.06 (0.08)	0.04 (0.07)	-10.83	15,921	-0.17	< .0001
Percent of Residents on Antipsychotic Medication	0.26 (0.15)	0.21 (0.15)	-15.45	15,921	-0.24	< .0001
Percent of Residents on Antidepressant Medication	0.48 (0.14)	0.47 (0.17)	-2.66	15,921	-0.04	.0081
Percent of Residents with Dementia Diagnosis	0.46 (0.18)	0.45 (0.23)	-3.00	15,921	-0.05	.0081
Percent of Residents with Depression Diagnosis	0.50 (0.23)	0.48 (0.26)	-4.41	15,921	-0.07	< .0001

Note. NH = nursing home. DF = degrees of freedom. ADL = activities of daily living. Type I error values adjusted for multiple *t*-tests using the Holm-Bonferroni method. Data for table derived from the complaint investigation and OSCAR survey datasets.

Table 4-13

Baseline Facility and Resident-aggregated Characteristics (2007-2008): Differences between Nursing Homes Receiving a Complaint on Whether a Deficiency Citation is Issued

	M (SD)					
Facility Characteristics	NHs with a Deficiency	NHs with No Deficiency	*t*	DF	*d*	*p*
Total Number of Residents	100.20 (57.92)	80.61 (58.16)	-21.17	15,921	-0.34	< .0001
Total Number of Beds	122.40 (67.96)	96.87 (65.82)	-23.96	15,921	-0.38	< .0001
Occupancy Rate	0.83 (0.17)	0.83 (0.19)	2.00	15,921	0.03	.1814
Percentage of Residents with Medicare	0.14 (0.12)	0.17 (0.21)	9.40	15,921	0.15	< .0001
Percentage of Residents with Medicaid	0.64 (0.20)	0.57 (0.26)	-18.04	15,921	-0.29	< .0001
Acuity Index for Residents	10.25 (1.46)	10.10 (1.74)	-5.80	15,921	-0.09	< .0001
Average ADL Score of Residents	3.93 (0.58)	3.95 (0.61)	2.15	15,921	0.03	.1584
Deficiency Score (Survey Deficiencies)	84.96 (118.30)	51.46 (79.21)	-21.30	15,921	-0.34	< .0001
Resident-aggregated Characteristics						
Percent of Residents with Psychiatric Diagnosis	0.23 (0.17)	0.20 (0.18)	-9.46	15,921	-0.15	< .0001
Percent of Residents with Behavioral Issues	0.29 (0.18)	0.28 (0.19)	-4.91	15,921	-0.08	< .0001
Percent of Residents with a Catheter	0.06 (0.05)	0.07 (0.07)	1.55	15,921	0.02	.3631
Percent of Residents Physically Restrained	0.06 (0.07)	0.05 (0.08)	-5.23	15,921	-0.08	< .0001
Percent of Residents on Antipsychotic Medication	0.27 (0.15)	0.24 (0.15)	-13.43	15,921	-0.21	< .0001
Percent of Residents on Antidepressant Medication	0.48 (0.13)	0.48 (0.15)	-0.65	15,921	-0.01	.5137
Percent of Residents with Dementia Diagnosis	0.45 (0.18)	0.46 (0.21)	1.40	15,921	0.02	.3631
Percent of Residents with Depression Diagnosis	0.50 (0.21)	0.49 (0.24)	-4.67	15,921	-0.07	< .0001

Note. NH = nursing home. DF = degrees of freedom. ADL = activities of daily living. Type I error values adjusted for multiple *t*-tests using the Holm-Bonferroni method. Data for table derived from the complaint investigation and OSCAR survey datasets.

Research Question 3

Longitudinal Analyses

Results from the three generalized estimating equations (GEEs), including odds ratios, are displayed in Tables 4-14, 4-15, and 4-16 to evaluate the two hypotheses for this question. Table 4-14 presents odds ratios results on the probability that a nursing home received a complaint during the study period. Nursing homes that were for-profit were 2.4 times more likely to receive a complaint than their nonprofit counterparts, and facilities belonging to a chain membership were 28% more likely to receive a complaint than non-chain facilities. Additionally, the greater the percentage of residents with care reimbursed by Medicaid indicated a 2.5 times greater chance of receiving a complaint and the presence of a resident council indicated that a facility would be 2.3 times more likely to receive a complaint. With respect to resident-aggregated characteristics, for every percent increase in the number of residents with a psychiatric diagnosis, there was a 23% greater chance of receiving a complaint and for every percentage increase in the number of residents physically restrained, there was a 71% greater chance of a complaint being levied.

Table 4-15 displays results of a GEE when the dichotomous dependent variable is whether a facility receives a deficiency citation following a complaint investigation. Results indicate that, of the nursing homes receiving a complaint, for-profit nursing homes and those belonging to a chain were 17% and 8%, respectively, more likely to receive a deficiency citation after an investigation. Similar to the results from whether a complaint was received, for every percentage increase of resident care reimbursed by Medicaid, there was a 23% increased likelihood of a facility receiving a citation following an investigation and the presence of a

resident council indicated that a facility was 34% more likely to receive a deficiency citation from a complaint. For every percent increase in the number of residents with behavioral issues, there was a 16% greater chance of a facility receiving a citation, and for every percent increase in the number of residents receiving antidepressant medications, there was a 17% increased likelihood of receiving a citation following an investigation. Lastly, for every percent increase in the number of residents with catheters, a facility was 4.5 times more likely to receive a citation following a complaint investigation.

To include the effect of the number of complaints each year on the number of deficiencies received by a particular nursing home, the third GEE includes a continuously-scaled dependent variable for the number of deficiencies received in a given year. Odds ratios for this GEE are presented in Table 4-16. For-profit status of nursing homes was associated with a 37% increased likelihood of receiving a complaint-related deficiency citation and chain membership indicated a 16% greater chance of receiving a citation following an investigation. For every percentage increase in the number of residents receiving Medicaid, there was a 47% increased chance of receiving a complaint-related citation, and the presence of a resident council was associated with a 71% greater likelihood of a citation. Additionally, for every percentage increase in the number of residents with a diagnosis of depression, there was a 64% greater likelihood of receiving a citation over the study period. Figure 4-1 displays the frequency of complaints per study year, grouped by allegation category code, while Figure 4-2 shows the frequency of deficiency citations issued within each allegation category. Both figures highlight a decrease both in the number of complaints and the number of deficiency citations issued over the five-year study period, but the categories with the greatest number of complaints are “Abuse,”

"Neglect," and "Care and Services," whereas the categories with the greatest number of deficiency citations are "Care and Services" and "Other."

Lastly, a Pearson product-moment correlation was conducted to determine if there was any relationship between the deficiency score for survey-related deficiencies and the deficiency score for complaint-related deficiencies that a nursing home might receive. Results showed that the two calculated deficiency scores, per facility, were correlated at a very low level ($r = .25$, $p < .0001$).

Table 4-14

Odds Ratios for Generalized Estimating Equation Analysis of Change in Facility and Resident-Aggregated Characteristics Associated with Receiving a Complaint over Study Period (2007-2012)

Facility Characteristics	β (*SE*)	OR	95% CI	*p*
For-profit	0.88 (0.03)	2.41	[2.29, 2.54]	< .0001
Chain Membership	0.25 (0.03)	1.28	[1.22, 1.35]	< .0001
Total Number of Beds	0.02 (0.0009)	1.02	[1.02, 1.02]	< .0001
Total Number of Residents	-0.002 (0.001)	1.00	[1.00, 1.00]	.0529
Percentage of Residents with Medicaid	0.94 (0.07)	2.56	[2.22, 2.94]	< .0001
Percentage of Residents with Medicare	0.06 (0.10)	1.06	[0.88, 1.29]	.5300
Acuity Index (Residents)	0.05 (0.009)	1.05	[1.03, 1.06]	< .0001
Presence of a Resident Council	0.85 (0.06)	2.34	[2.10, 2.62]	< .0001
Presence of a Family Council	-0.08 (0.03)	0.92	[0.88, 0.97]	.0021
Resident-aggregated Characteristics				
Percent of Residents with Psychiatric Diagnosis	0.21 (0.09)	1.23	[1.04, 1.45]	.0162
Percent of Residents with Behavioral Issues	-0.13 (0.08)	0.88	[0.75, 1.03]	.1205
Percent of Residents with a Catheter	-0.06 (0.21)	0.94	[0.62, 1.43]	.7750
Percent of Residents Physically Restrained	0.54 (0.22)	1.71	[1.12, 2.61]	.0135
Percent of Residents on Antipsychotic Medication	1.27 (0.12)	3.57	[2.82, 4.52]	< .0001
Percent of Residents on Antidepressant Medication	0.03 (0.10)	1.03	[0.84, 1.27]	.7458
Percent of Residents with Dementia Diagnosis	-0.70 (0.07)	0.50	[0.43, 0.57]	< .0001
Percent of Residents with Depression Diagnosis	0.10 (0.06)	1.10	[0.97, 1.25]	.1327

Note. SE = standard error. OR = odds ratios. CI = confidence interval. Data for table derived from the complaint investigation and OSCAR survey datasets.

Table 4-15

Odds Ratios for Generalized Estimating Equation Analysis of Change in Facility and Resident-Aggregated Characteristics Associated with Receiving a Deficiency Citation Following a Complaint Investigation over Study Period (2007-2012)

Facility Characteristics	β (*SE*)	OR	95% CI	*p*
For-profit	0.16 (0.02)	1.17	[1.12, 1.22]	< .0001
Chain Membership	0.08 (0.02)	1.08	[1.05, 1.12]	< .0001
Total Number of Beds	0.002 (0.0003)	1.00	[1.00, 1.00]	< .0001
Total Number of Residents	-0.004 (0.0004)	1.00	[1.00, 1.00]	< .0001
Percentage of Residents with Medicaid	0.21 (0.06)	1.23	[1.09, 1.39]	.0006
Percentage of Residents with Medicare	-0.34 (0.09)	0.71	[0.60, 0.85]	.0002
Acuity Index (Residents)	-0.04 (0.01)	0.96	[0.95, 0.98]	< .0001
Presence of a Resident Council	0.29 (0.07)	1.34	[1.17, 1.53]	< .0001
Presence of a Family Council	-0.01 (0.02)	1.00	[0.95, 1.03]	.5591
Resident-aggregated Characteristics				
Percent of Residents with Psychiatric Diagnosis	-0.24 (0.06)	0.79	[0.70, 0.89]	< .0001
Percent of Residents with Behavioral Issues	0.15 (0.06)	1.16	[1.04, 1.30]	.0079
Percent of Residents with a Catheter	1.51 (0.18)	4.54	[3.22, 6.41]	< .0001
Percent of Residents Physically Restrained	-0.27 (0.15)	0.76	[0.56, 1.03]	.0777
Percent of Residents on Antipsychotic Medication	-0.07 (0.08)	0.93	[0.79, 1.09]	.3789
Percent of Residents on Antidepressant Medication	0.15 (0.07)	1.17	[1.01, 1.35]	.0370
Percent of Residents with Dementia Diagnosis	-0.17 (0.06)	0.84	[0.76, 0.94]	.0022
Percent of Residents with Depression Diagnosis	0.17 (0.05)	1.19	[1.08, 1.30]	.0003

Note. SE = standard error. OR = odds ratios. CI = confidence interval. Data for table derived from the complaint investigation and OSCAR survey datasets.

Table 4-16

Odds Ratios for Generalized Estimating Equation Analysis of Change in Facility and Resident-Aggregated Characteristics Associated with the Number of Deficiencies Received per Nursing Home over Study Period (2007-2012)

	β (*SE*)	OR	95% CI	*p*
Number of Complaints per Year	0.02 (0.002)	1.02	[1.01, 1.02]	< .0001
Year	-0.14 (0.02)	0.87	[0.84, 0.90]	< .0001
Number of Complaints x Year	0.003 (0.0008)	1.00	[1.00, 1.00]	< .0001
For-profit	0.31 (0.02)	1.37	[1.31, 1.43]	< .0001
Chain Membership	0.14 (0.04)	1.16	[1.07, 1.25]	.0005
Total Number of Beds	0.002 (0.0003)	1.00	[1.00, 1.00]	< .0001
Total Number of Residents	-0.0001 (0.0004)	1.00	[1.00, 1.00]	.8965
Percentage of Residents with Medicaid	0.38 (0.08)	1.47	[1.26, 1.70]	< .0001
Percentage of Residents with Medicare	0.10 (0.11)	1.11	[0.89, 1.37]	.3580
Acuity Index (Residents)	0.0003 (0.009)	1.00	[0.98, 1.02]	.9712
Presence of a Resident Council	0.54 (0.07)	1.71	[1.51, 1.95]	< .0001
Presence of a Family Council	-0.11 (0.04)	0.90	[0.83, 0.98]	.0126
Percent of Residents with Psychiatric Diagnosis	0.02 (0.08)	1.02	[0.87, 1.18]	.8435
Percent of Residents with Behavioral Issues	-0.46 (0.17)	0.63	[0.46, 0.87]	.0053
Percent of Residents with a Catheter	0.66 (0.47)	1.94	[0.77, 4.86]	.1603
Percent of Residents Physically Restrained	-0.43 (0.18)	0.65	[0.46, 0.93]	.0188
Percent of Residents on Antipsychotic Medication	0.10 (0.12)	1.10	[0.87, 1.39]	.4325
Percent of Residents on Antidepressant Medication	-0.21 (0.13)	0.81	[0.63, 1.05]	.1079
Percent of Residents with Dementia Diagnosis	-0.37 (0.11)	0.69	[0.56, 0.86]	.0007
Percent of Residents with Depression Diagnosis	0.49 (0.13)	1.64	[1.27, 2.12]	.0002

Note. SE = standard error. OR = odds ratios. CI = confidence interval. Data for table derived from the complaint investigation and OSCAR survey datasets.

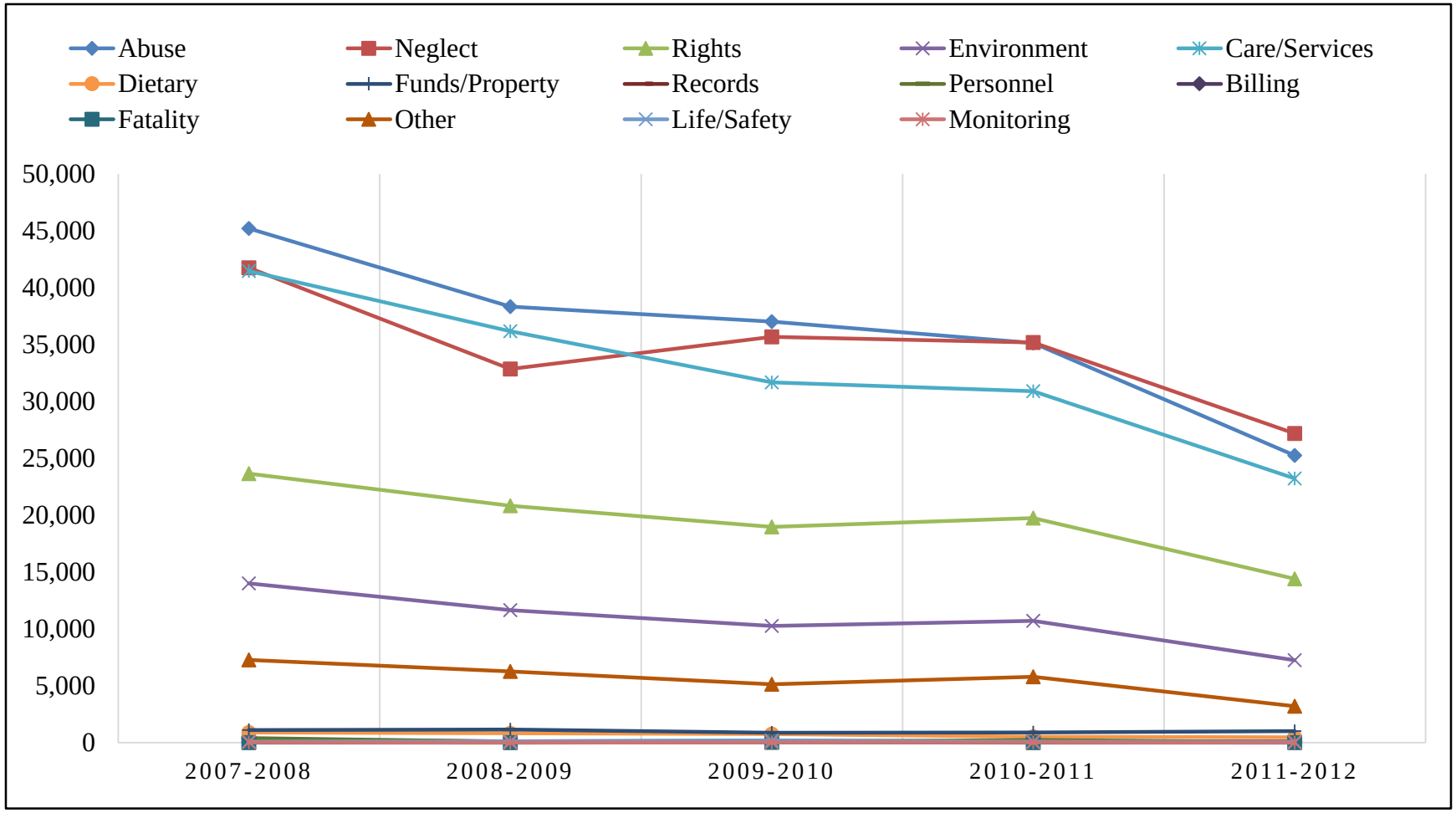

Figure 4-1. Frequency of complaints per year by allegation category for entire study period (2007 – 2012). Data derived from the complaint investigation dataset.

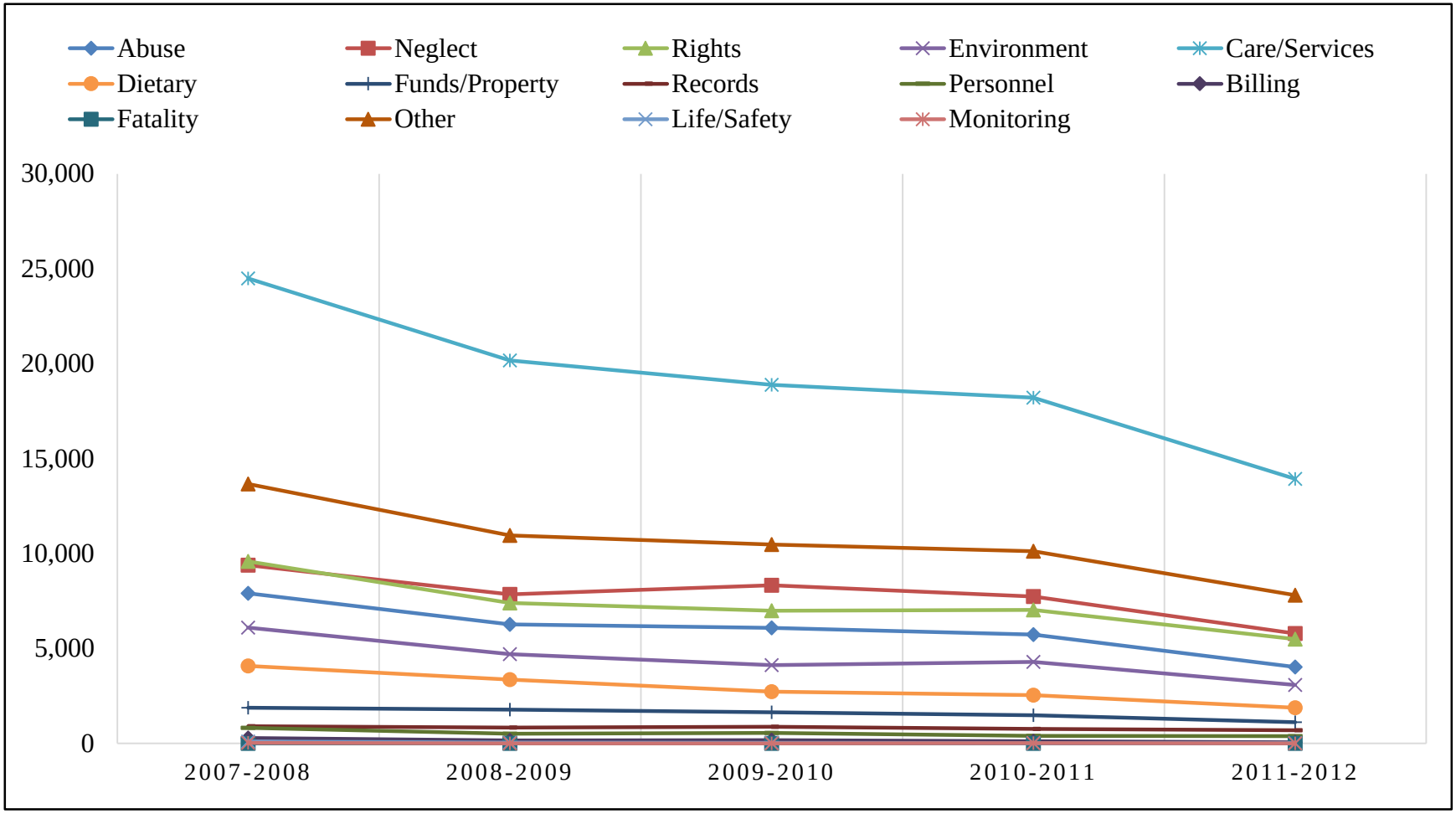

Figure 4-2. Frequency of complaint-related deficiency citations per year by allegation category for entire study period (2007 – 2012). Data derived from the complaint investigation dataset.

CHAPTER FIVE:

DISCUSSION

The following chapter discusses the significance of the results in this dissertation to policy and initiatives regarding analyses of quality of care in nursing homes, including the current lack of inclusion of complaints and complaint investigations in such analyses. Limitations of this study are included, as well. The chapter closes with conclusions to be drawn from results of the study analyses.

Discussion

Results of this study should be evaluated in light of the previous research conducted by Stevenson (2006). There was a greater number of complaints lodged during the current study period (2007 – 2012) than during the previous study period (1998 – 2002): N = 706,596 and N = 534,995, respectively. This should also be considered in terms of the number of nursing homes, which have decreased between the two study periods: N = 19,893 in Stevenson (2006) and N = 15,518 in the current study. The average nationwide annual complaint rate of 13.3 complaints per 100 residents was also greater than that of 4.2 complaints per 100 residents found in Stevenson (2006).

Approximately 23% of nursing homes, on average, had zero complaints annually in the current study, compared to 35% of facilities in Stevenson (2006) with zero complaints annually. In Stevenson (2006), the state with the greatest number of complaints for the study period was

Washington with 16.5 complaints per 100 residents per year. In the current study, however, the state with the greatest number of complaints for this study period was Delaware with 48.06 complaints per 100 residents per year. The category that received the most complaints in the current study, "Care or Services," was also the category with the most complaints in Stevenson (2006). The categories of "Resident Rights" and "Resident Neglect" also had a higher number of complaints in both studies.

To address the research questions and hypotheses posed in this study, the following observations were noted. Among the states that had the greatest prevalence of complaints, only two of those states, Indiana and Texas, are among the states with the greatest number of long-term care facilities. As of 2011, Texas has the most certified nursing facilities of any state, and Indiana is the ninth largest state in terms of number of facilities (Kaiser Family Foundation, 2011). Indiana had the second greatest number of complaints, and Texas had the fifth greatest number of complaints. All of the other states with a large number of nursing homes (e.g., California, Ohio, Illinois, Pennsylvania) had fewer complaints when adjusted by the number of residents in each state. This suggests that there are state-level factors in the delivery of care and the quality of care within long-term care facilities that may affect resident outcomes and that mere number of facilities and residents does not alone indicate poor or optimal quality.

The second hypothesis in this study addressed survey region variability in the complaint dataset, which has been noted in the Online Survey Certification and Reporting (OSCAR) dataset for annual facility surveys. Results from analyses showed survey region variability in terms of substantiation rates of investigated complaint allegations. There were significant differences in substantiation rates (*see* Table 4-5). This study is the first to analyze the complaint investigation data for such variability, but given that the data are collected and entered by the same state

survey agencies that conduct annual nursing home surveys, it might be expected that such variability is present in both sets of data. It should also be noted that some survey regions have a greater number of residents than others, but that a greater number of residents (or a greater number of complaints) are not necessarily indicative of a higher substantiation rate for complaints. This variability warrants further research and analysis.

In addition, priority level assigned to complaints, calculated by the number of days between when the complaint is received revealed differences in terms of substantiation rates. For the highest three priority levels (i.e., greater harm or risk of harm to nursing home residents), there were no significant differences in substantiation rates among those three levels. However, there were significant differences in substantiation rates between the lowest priority level (i.e., no actual harm with the potential for only minimal harm) and the three higher priority levels. Investigations of complaints that are assessed to be in the lower priority level can be delayed until the next annual survey for a facility, rather than being investigated separately, which may affect substantiation rates when included as part of an annual survey for a particular nursing home and could explain the observed differences.

Mapping deficiency citations issued to the allegation category assigned by the state survey agency proved more challenging and results were not entirely clear. Grouping expected deficiency citations by allegation category, following a substantiated complaint, and within directly-related and broadly-related categories revealed results lower than expected. In the majority of allegation categories, the citations mapped show up, at most, approximately a quarter of the time (in most cases, much lower than this). The only exception to this is the "Care or Services" allegation category, where the directly-related citations accounted for roughly 42% of citations issued for substantiated complaints in that category. Of course, in this particular

allegation category, there are more mapped citations than in other categories, both in the directly-related and broadly-related groupings, which could explain these results. When survey agency staff investigate a complaint at a facility, they are not bound by a limited set of deficiency citations that are either directly or broadly related to the complaint levied; and, indeed, good policy would be that their hands are not tied, so to speak, when observing conduct in and the condition of a facility under investigation. Also, the most frequently issued citations overlap between survey-related deficiencies and complaint-related deficiencies (*see* Tables 4-7 and 4-8), which may indicate that there are common issues facing all nationwide nursing homes or, alternatively, that there are certain citations that surveyors are more familiar with and are issued more frequently to facilities.

What is somewhat perplexing, however, is that one might expect that, when a complaint is substantiated (i.e., investigators found information to verify what was alleged), deficiency citations issued to a facility would somewhat align with the allegation category assigned. From the results in this study, that does not appear to be the case. When casting a wider net with a larger number of mapped citations, one would expect that there might be more citations matching up with the anticipated allegation category. This also was not supported in the analyses when looking at certain categories (e.g., "Resident Rights"), where a greater number of mapped citations did not align with the actual citations issued for allegations in that category. In addition, the "Other" category is the second most prevalent in terms of citations issued (*see* Table 4-9), but there is little information provided in the Centers for Medicare and Medicaid Services (CMS) State Operations Manual regarding which complaints would be assigned to this allegation category when received by the state survey agency. This range in variability also warrants further examination to analyze the impact on a facility's quality ratings and reputation.

For the second research question in this study, it was hypothesized that for-profit facilities would have a greater number of complaints and a greater number of substantiated complaints than their nonprofit counterparts. Study analyses revealed significant differences between for-profit and nonprofit nursing homes on whether a complaint is received and whether a deficiency citation is issued following a complaint investigation, with for-profit facilities having more complaints and complaint-related deficiency citations than nonprofit facilities. Additionally, facilities belonging to a chain membership tended to have more complaints and more complaint-related deficiency citations issued than did non-chain facilities. While occupancy rate was not dispositive of whether a facility received a deficiency citation following a complaint investigation, facilities with more residents and a greater number of beds were associated with a nursing home receiving a complaint-related deficiency.

The second research question in this study also hypothesized that nursing homes with a greater number of Medicare-reimbursed residents would be related to a greater number of complaints within that facility and that nursing homes with more impaired residents would have fewer complaints. Results showed that facilities with fewer residents receiving Medicare for care reimbursement had more complaints (*see* Table 4-12), which does not support the first hypothesis. More residents receiving Medicaid to reimburse for care costs indicated that a facility was more likely to have a complaint. The results on percentages of Medicare and Medicaid reimbursement also were similar for whether a nursing home would receive a deficiency citation as a result of a complaint investigation (*see* Table 4-13), in that facilities with fewer Medicare-reimbursed residents and more Medicaid-reimbursed residents were more likely to receive a deficiency citation following an investigation.

For nursing homes with more impaired residents, however, as measured in this study, greater impairment was found in nursing homes that had complaints as opposed to those facilities without complaints. This also does not lend evidence to support the hypothesis made, based upon research in the Kline et al. (2008) study. Nursing homes with greater percentages of residents with cognitive impairment (e.g., behavioral issues, psychiatric diagnoses, a diagnosis of depression, a diagnosis of dementia) were associated both with receiving a complaint and a complaint-related deficiency citation after an investigation. With respect to physical impairment, more residents physically restrained and greater numbers of residents on either an antipsychotic or antidepressant medication was also associated with both a facility receiving a complaint and complaint-related deficiency citation. Residents with greater impairments, both cognitive and physical, often have greater care needs and are more medically complex. Given this, the increased possibilities for an error in care may explain why facilities with more impaired residents are associated with complaints and deficiency citations. Additionally, Medicare reimburses resident care at a higher rate than does Medicaid, but only for a maximum of 100 days. Facilities with more Medicare residents may have the ability to have more funds to dedicate to better staffing, more education and training, and better equipment or supplies to serve residents in the nursing home and, thus, potentially reduce the likelihood that a complaint would be levied against such a facility.

The final research question in this study addressed changes over time in complaints and complaint-related deficiency citations, as well as the relationship between complaint-related deficiencies and survey-related deficiencies. The first hypothesis for this question speculated that for-profit nursing homes would be less likely to improve in quality, as measured by both complaints and complaint-related deficiency citations, over time. Longitudinal analyses in this

study, from years 2007 – 2012, revealed that for-profit facilities were more than twice as likely to receive complaints as nonprofit facilities, and were also more likely to receive a deficiency citation following a complaint investigation than nonprofit nursing homes. For-profit status was also associated with a greater number of complaints than nonprofit facilities (*see* Table 4-16). Facilities belonging to a chain membership were also more likely, over time, to receive a complaint than were non-chain facilities, and were also more likely to receive a complaint-related deficiency citation. Previous research has indicated that for-profit facilities tend to receive more deficiency citations than nonprofit facilities, and the citations received in for-profit nursing homes are often related to "deleterious resident outcomes" (Hillmer, Wodchis, Gill, Anderson, & Rochon, 2005).

As far as the relationship between survey-related deficiencies and complaint-related deficiencies, there is some overlap when looking at the most frequently issued citations (*see* Tables 4-7 and 4-8). While differing in frequency, the most often-cited deficiencies are largely the same between the complaint investigations and the survey investigations. This may indicate that factors affecting quality, when evaluated in terms of citations issued to facilities, are consistent within nursing homes, though some issues may more directly affect resident care and quality of life and may manifest in the form of a complaint rather than as something discovered on an annual survey inspection.

The effect of complaint investigations and efforts to improve quality through regulation (i.e., issuance of deficiency citations to facilities with substandard care) to reduce the number of instances of deficient practices complained about cannot be fully described by analyses in this study. Longitudinal analyses revealed declining numbers of complaints (*see* Figures 4-1 and 4-2) and, subsequently, complaint-related deficiency citation over the five years included in this

study. Whether that is a function of complaint investigations or other quality improvement initiatives undertaken by regulators or industry members cannot be determined from these analyses.

Lastly, with respect to payer source for resident care, including the Medicare-reimbursement variable in the longitudinal analyses did not yield statistically significant results for whether a nursing home receives a complaint. However, when analyzing complaint-related deficiency citations over the five study years, more resident care reimbursed by Medicare did indicate that a facility would be less likely to receive a complaint-related deficiency citation following an investigation (*see* Table 4-15). In addition to this, longitudinal analyses also indicated, over time, that a greater percentage of residents receiving Medicaid-reimbursed care was associated with a facility being twice more likely to receive a complaint and also more likely to receive a complaint following an investigation.

Policy Implications

The research described in this study serves to advance several policy initiatives related to quality of care in U.S. nursing homes. Complaints and subsequent investigations of alleged misconduct have the potential to provide insight into aspects of quality of care that are not sufficiently captured with current analyses of quality in the existing literature. Mapping deficiency citations to categories for the alleged conduct could be used to aid surveyors by providing a greater understanding of which citations are more prevalent or indicative of a certain category of improper conduct and could be included in education and training programs for state survey staff. Further, greater understanding of substantiated complaint rates and issued deficiency citations, including variations by survey region, allows for improvements in the

complaint investigation and resolution process and a more efficient use of state surveyor resources.

To assist in remedying the lack of consumer information on nursing homes, the current CMS Five-Star Quality Rating System takes into account deficiencies arising from complaint investigations in the previous 36 months (i.e., three years) from the current calendar year by assigning "points" to a nursing home based upon deficiencies issued as a result of a complaint investigation. The complaint-related deficiencies are paired with the survey-related deficiencies in giving a nursing home its overall deficiency score for the Five-Star rating. The current criteria comprising the Five-Star rating includes health survey investigations (any survey or complaint investigation deficiencies are included here), staffing measures, and nine quality measures (e.g., decline in self-performance of ADLs, catheter usage, physical restraints, urinary tract infections, self-reporting moderate to severe pain, one or more falls with major injury). Deficiency citations that are assessed against a facility on both the annual survey and during a complaint investigation, if the complaint investigation occurs within 15 days of the survey, are only counted once for purposes of calculating points for the Five-Star rating (Technical Users' Guide, Design for Nursing Home Compare Five-Star Quality Rating System, CMS, 2012).

However, from the current study, if complaints are substantiated and no deficiency citation is issued to the facility, a potentially useful metric is missing in analyses of nursing home quality that could be added to the Five-Star rating for facilities. Further modifications to the Five-Star ratings could include the new data on number of complaints, or include the number of complaints if facilities do not improve over time on the number of complaints received or the scope and severity of the substantiated conduct. Study results revealed statistically significant differences between facilities that receive complaints and facilities that don't receive complaints,

which is a component of quality in nursing homes not currently included in the literature nor in the Five-Star rating system. Perhaps a useful addition to the Five-Star rating would be the number of complaints received in a facility in a given year, which could be its own indicator of quality or be added to the "points" calculated using deficiency citations issued to a facility.

A policy consideration that is often discussed with respect to nursing homes is reimbursement levels for the various payer sources (e.g., Grabowski, Angelelli, & Mor, 2004; Mor et al., 2004). Results from this study further demonstrated the reduced ability of facilities with a greater percentage of resident care reimbursed by Medicaid to improve over time, as measured here by complaints. Medicaid reimburses at a lower rate than does Medicare or private pay, in most states, which may provide facilities less capital to use for improvements in resident care, to purchase supplies or equipment, or to appropriately compensate staff in efforts to reduce turnover.

Lastly, it is important to note that data on the complainant (i.e., the person lodging a complaint with the state survey agency) has been omitted from the complaint investigation dataset. The prior research by Stevenson (2006) analyzed the source of complaints, whether said complaints came from the individual resident, their family, an employee (former or current) of the facility, an ombudsman, or "other" (which could be an adult protection worker or law enforcement officer, potentially). For future research, and for developing policies to enhance resident quality of life, it would be useful to have these data added back into the dataset. Currently, the number of complainants is available for each complaint, but tracking a complaint based on the complainant source would aid in efforts to improve resident satisfaction, improve satisfaction of family members (including those with severely impaired family members in a

nursing home), and determine if staff have concerns about resident care in their facility, which might be indicative of deeper problems to address.

Limitations

Both the complaint dataset and the OSCAR survey dataset are administrative datasets, which presents complications when using such datasets in analyses. While there have been several analyses of the validity of the OSCAR survey dataset, much less has been done on the validity of the measures within the complaint dataset. To date, few studies have even used the complaint dataset, but as the data collected within this dataset are gathered by the same surveyors that collect the OSCAR survey data, it could be argued that the flaws inherent in the OSCAR survey data will also be present within the complaint data. Additionally, the survey region variability present in the OSCAR survey dataset (Castle, 2008) likely would manifest itself in some way in the complaint dataset. Interpretations of Federal regulations and the assessment of deficiency citations against a nursing home are present in both annual survey inspections and complaint investigations, which are both conducted by state survey agencies. While there are Federal standards for how complaints are to be investigated, each state has flexibility to determine how to conduct these investigations (Stevenson, 2006), creating additional variation in the complaint processes.

Due to the dual nature of investigating complaints levied against nursing homes (*see* Figure 2-3), depending on when the complaint is lodged with the state survey agency and the priority assigned to the complaint by the state survey agency, the deficiency citations present in the complaint dataset are an underrepresentation of all complaints regarding nursing home quality. Additionally, there may be individuals displeased with their care or quality of life who

are impaired to the degree that they cannot lodge a complaint against the facility. To the extent that residents or family members are intimidated or fear reprisal from the nursing home providing care and services, the results reported here are a further underrepresentation of the true number of complaints within a given facility. This study does not attempt to adjust for the number of complaints that are not reported to state survey agencies.

The deficiency citations issued against a facility, as indicated in the complaint dataset, will only be those that occurred outside of an annual, regular survey inspection. This dual process could also represent a bias in the complaint data, as surveyors are only investigating the allegations complained about during a complaint investigation rather than investigating complained-about conduct as part of an extensive survey of a facility. Stevenson (2006) has suggested that complaints and complaint investigations should be viewed and used as supplemental information to other quality measures of care processes within nursing homes, given the incomplete nature of the data contained within this dataset, and the results of this study further support that recommendation. Additionally, because hospital-based facilities were excluded as part of the analyses in this study, the results and implications presented here should only be generalized to free-standing or community-based nursing homes.

As previously noted, there are concerns as to the reliability of using the OSCAR survey dataset due to the inconsistent reporting of facility-level measures (Arling, Kane, et al., 2007). While several variables within this dataset are verified by the state surveyors, some data, such as staffing, is self-reported by each nursing home (Castle, 2008). The data within the complaint dataset are reported by the state surveyors conducting the complaint investigations. If the unit of observation or analysis, however, is the nursing home itself, as is the case for the current study, the administrative data contained within OSCAR have numerous benefits in analyses of quality

of care delivered to residents. Lastly, as previously noted, the U.S. General Accounting Office reports indicate that the OSCAR data for deficiency citations are generally reliable (Mullan & Harrington, 2001).

Use of Administrative Data

Administrative data present several challenges for research. There have been questions raised as to the reliability of using the OSCAR dataset due to the inconsistent reporting of facility-level measures (Arling, Kane, et al., 2007). Also, potentially problematic is that some information contained within the OSCAR dataset (e.g., staffing information) is self-reported by each nursing home (Castle, 2008). Administrative data have also been characterized as having low sensitivity, but the ability to still identify quality of care concerns or "gaps" (Zhan & Miller, 2003). Multiple studies, designed around medical record reviews, found appropriate levels of accuracy in identifying quality of care issues that were of concern to address via policy and practice initiatives (Zhan & Miller, 2003). One noted benefit to using the OSCAR dataset, as noted by Grabowski and Castle (2004), is that policymakers, or the government agencies upon which policymakers rely (e.g., the U.S. General Accounting Office, the Institute of Medicine, Centers for Medicare and Medicaid Services), often turn to these datasets when attempting to implement policy changes aimed at improving care delivery for residents residing in nursing homes. Those wanting to also shape policy might be well-advised to demonstrate policy initiatives via datasets already relied upon to inform policy.

In addition, the OSCAR dataset is the only dataset that captures multiple measures of quality within a nursing home, and contains a nationwide breadth of data, especially each facility's assessed deficiency citations (Castle, 2011). Existing studies attempting to document,

analyze, and improve quality of care in nursing homes primarily rely upon the OSCAR data. The OSCAR dataset has "considerable face validity" and is used by many researchers attempting to analyze and improve quality within the nursing home setting (Grabowski & Castle, 2004).

Future Research

Building on this study, future research could further analyze complaints and complaint investigations in light of the nine quality measures present in the OSCAR survey dataset. Analyses could investigate whether complaints in nursing homes and subsequently-issued deficiency citations mapped onto any of the frequently used quality measures. Complaint investigation outcomes (i.e., substantiations of alleged conduct, issued deficiency citations) could be paired with the quality measures to determine whether facilities that poorly perform in terms of quality measure outcomes also perform similarly on complaint investigations or whether certain quality measures are indicative of complaints being lodged against a specific nursing home. To determine the extent to which various reimbursement methodologies affect the ability of a facility to improve in the number of complaints or the issuance of complaint-related deficiency citations, future research should analyze state Medicaid reimbursement rates and rates of complaints. States with lower Medicaid reimbursement rates may have facilities that are constricted and unable to improve quality, in terms of complaints and complaint-related deficiency citations, due to lack of resources.

Further analyses could utilize the Five-Star rating and perform similar analyses with complaint investigations, substantiations of complaints, and issued deficiency citations against a facility. Other studies could account for available resources in a particular facility (e.g., reimbursement structures for care provided to residents) and how those resources affect the

complaint process, including the ability to remedy a deficiency issued following a complaint investigation. Further analyses of facility-level characteristics that are associated either with receiving a complaint or receiving a complaint-related citation, as noted in this study, would be valuable contributions to the existing literature on quality in nursing homes.

Other research should analyze deficiency scores for nursing homes, as part of the Five-Star rating, and determine the proportion of that deficiency score that is related to complaints and the proportion related to survey deficiencies. To more thoroughly analyze quality of care in nursing homes, complaint-related deficiencies should be compared to deficiencies received on recent annual surveys to gain better understanding of the effect of complaints on quality (e.g., a high number of unsubstantiated complaints could indicate poor quality within a facility which could then be confirmed with survey deficiencies.

This study also noted survey region variability in the substantiation of complaints, similar to the survey region variability found in the OSCAR dataset. Future research could further analyze this variability. Analyses could focus on why there are differences among the survey regions when the guidance and State Operations Manual are designed to promote consistency in outcomes of both surveys and complaint investigations. Such studies should take into account the nested nature of nursing homes within states within CMS survey regions, as well.

While the results of this study can largely be used to improve the quality of complaint investigations and potentially promote consistency among the ten CMS survey regions, there are implications for practitioners in the field, as well. Profit status and chain membership may be structural factors that are not easily modified, but greater emphasis can be given to the care delivered to prevent or reduce many of the resident-aggregated characteristics that were indicative of a facility receiving a complaint or complaint-related deficiency citation. Working

to reduce the number of residents with orders for restraints or the number of residents with a catheter, for example, could yield dividends in a reduction of deficiency citations and fines that can accompany these citations. Nursing home administrators need to understand the complaint process and how complaint-related and survey-related citations are factored into the CMS Five-Star rating. Complaints may indeed be the resident "voice" of dissatisfaction with care and administrators could use the results of this study to improve care delivery and reduce the number of complaints lodged against their facility. Future research could also evaluate zero-complaint facilities to determine what, if anything, those facilities do to address complaints in a timely manner or address an issue before it would rise to the level of a complaint to the state survey agency for further investigation.

Lastly, future research should analyze trends over time for allegation categories and frequency of complaints issued within each category. While there are commonly-issued citations for both complaint investigations and regular surveys, further analyses of trends in the issuance of deficiencies could provide more useful information for quality considerations in nursing homes and could potentially yield another valuable metric for the Five-Star rating.

Conclusions

It is important to continually strive to improve the quality of care delivered to residents of nursing homes, a population that is more physically frail and cognitively impaired than the majority of the public, and to improve quality of life, either directly or indirectly through the improvement in care delivery. The care needs of residents in nursing homes continues to become more complex (Castle, 2008), with contemporary nursing homes often caring for the most frail residents.

Nursing home residents are often more vulnerable to lapses in care because of deteriorations in physical health and cognitive impairment, and this includes an increased susceptibility to abuse and neglect (Castle, 2011; Dyer et al., 2002). While analyses of quality can be derived from annual surveys, more information aids in the improvement of quality of care and quality of life for nursing home residents. The complaint investigation data add to the existing knowledge about indicators of both good and poor quality and existing knowledge of patterns in the improvement of care within facilities over time.

While there is an emphasis on preventing or reducing comorbidities, the nursing home population experiences higher levels of morbidity and impairment, by definition, than does the general population (Davis, 1991). Due to this increased vulnerability and the nature of oversight of the care delivered in nursing homes, it becomes increasingly important to assess and ensure the quality of nursing home care, being especially mindful of resident reports of their treatment via complaints on the quality of care received. Complaints and investigations of allegations provide additional information on the quality of care delivered within United States nursing homes, and this study adds to the valuable literature analyzing measures of quality to continuously work to improve the life of nursing home residents.

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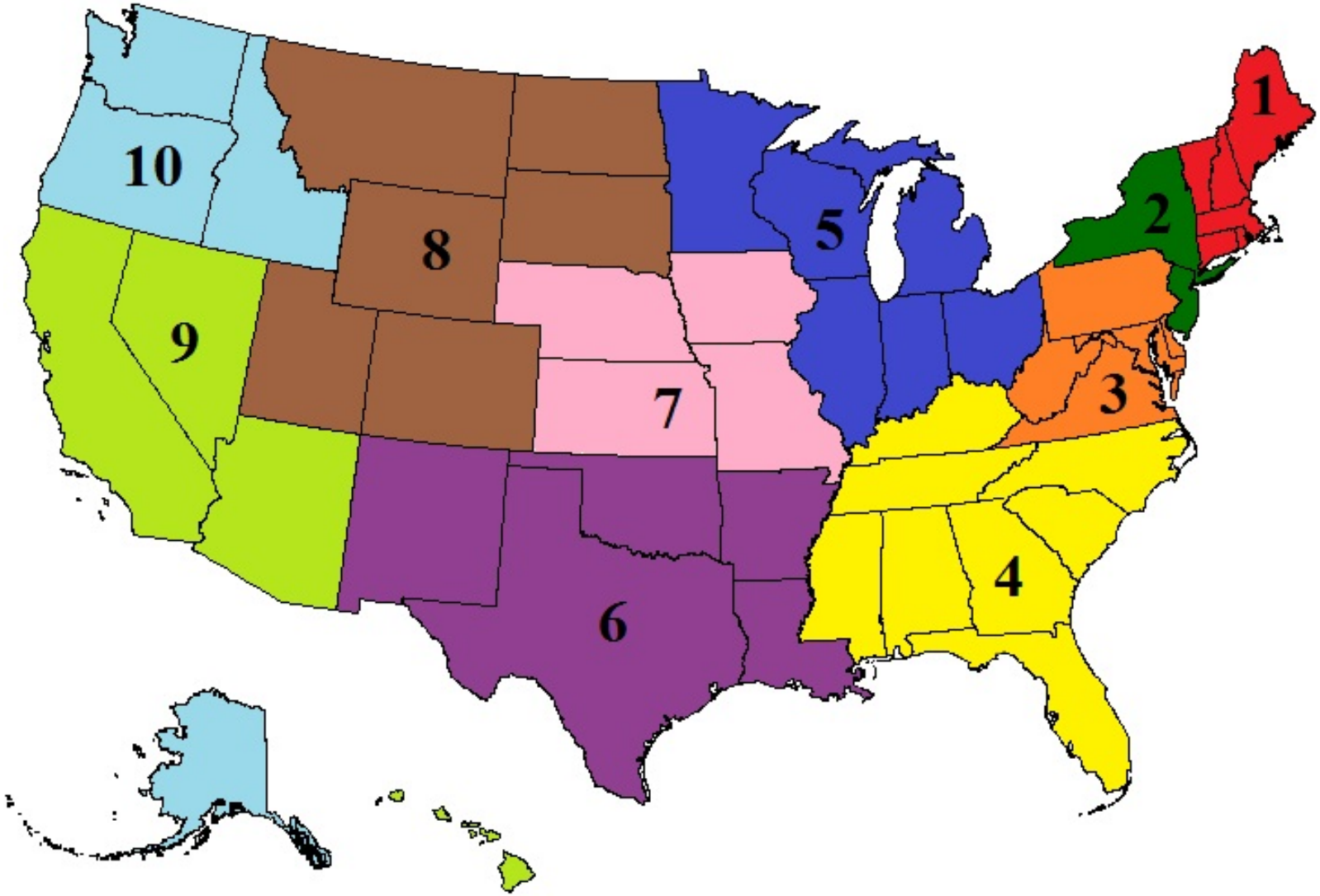
APPENDICES

Appendix A: Map of CMS Nursing Home Survey Regions



Appendix B: Allegation Category Codes for Complaint Allegations

CMS category code	CMS category name	Florida category name	Florida definitions for categories
1	Resident Abuse	Resident/Patient/Client Abuse	The willful infliction of physical, mental, or psychological pain.
2	Resident Neglect	Resident/Patient/Client Neglect	The willful failure to provide goods and services to meet the needs of the resident.
3	Resident Rights	Resident/Patient/Client Rights	Resident rights violations, lost/stolen items, or refusal of medical records.
4	Patient Dumping	Admission, Transfer, and Discharge Rights	Resident being dumped because the payment source is Medicare/Medicaid. Inappropriate discharge of a resident without appropriate notice as required by law or dumping of a resident because of lack of insurance. Other discharge planning.
5	Environment	Physical Environment	Equipment or building needing repairs or not meeting standards/code, poor air quality, temperatures not maintained as required by law, sanitation, rodents/insects, or equipment in disrepair.
6	Care or Services	Quality of Care/Treatment	Failure to provide ADL care; short staffing or failure to staff to meet the needs; any allegations of care needs not being met; call lights, falls/injury, lack of supervision, plan of care, pressure sores, weight loss, inappropriate residents/patients; or medication problems/errors.

Appendix B (continued)

CMS category code	CMS category name	Florida category name	Florida definitions for categories
7	Dietary	Dietary Services	Nutritional needs are not being met or menus are not posted.
8	Misuse of Resident Funds or Property	Misappropriation of Property	Facility misuse of resident funds or property.
9	Certification or Unauthorized Testing	Lab General	Lab complaints only. Lab testing without physician orders, lab state licensure issues, proficiency testing, radiology tests provided without physician orders, lab-related transfusion related fatalities/adverse events, unqualified personnel, or unauthorized testing.
10	Proficiency Testing	Lab General	Lab complaints only. Lab testing without physician orders, lab state licensure issues, proficiency testing, radiology tests provided without physician orders, lab-related transfusion related fatalities/adverse events, unqualified personnel, or unauthorized testing.
11	Falsification of Records or Reports	Falsification of Records/Reports	Falsification of records/reports.
12	Unqualified Personnel	Unqualified Personnel	Staff providing services without appropriate training, certification, or license.
13	Quality Control	Analytic	Lab complaints only. Quality control, other.
14	Specimen Handling	Pre-Analytic	Lab complaints only. Pre-analytic specimen handling, other.

Appendix B (continued)

CMS category code	CMS category name	Florida category name	Florida definitions for categories
15	Diagnostic Discrepancy or Erroneous Test Results	Post-Analytic	Lab complaints only. Laboratory providing false or erroneous test results or falsification of records/reports.
16	Fraud or False Billing	Fraud/False Billing	Fraud. (Close allegation and refer appropriately.)
17	Fatality or Transfusion Fatality	Fatality/Transfusion Fatality	For non-laboratory complaints.
18	Other	Other Services	Used primarily for hospital complaints. (Formerly social services, and includes emergency services, laboratory services, radiological services, and hospital social services.)
19	Life Safety Code	Life Safety Code	Any allegations of fire hazards or fire alarms not working.
20	State Monitoring	No category provided.	No definition provided.

Note. CMS = Centers for Medicare and Medicaid Services in the United States Department of Health and Human Services. ADL = activities of daily living. Some categories have overlapping definitions in the Florida guidance to surveyors (e.g., "Certification or Unauthorized Testing" and "Proficiency Testing"). Definitions provided for Florida came from the VERSA Regulation Manual, used by the Complaint Administration Unit in the State of Florida Agency for Health Care Administration. The manual was last updated in April 2015 and is continually updated by Complaint Administration Unit staff members.

Appendix C: Frequency and Percent of Deficiency Citations (F-Tags) Issued After a Complaint Investigation for Entire Study Period (2007 – 2012)

F-Tag	Citation Description	Number of Times Issued	%
F150	Resident rights; SNF/NH defined	11	0.00
F151	Resident exercise rights; no coercion or reprisal	455	0.15
F152	Rights of resident exercised by surrogate	282	0.09
F153	Resident access to and copies of records	420	0.14
F154	Resident informed of health status and condition	447	0.15
F155	Right to refuse treatment or research	685	0.22
F156	Resident informed of charges and legal rights	1,273	0.42
F157	Resident notified of significant changes	14,537	4.74
F158	Resident manages own financial affairs	62	0.02
F159	NH management of resident funds	822	0.27
F160	Conveyance of resident funds upon death	280	0.09
F161	NH surety bond or other assurance	167	0.05
F162	Limits on charges to resident personal funds	83	0.03
F163	Resident choice of primary physician	96	0.03
F164	Privacy and confidentiality	1,819	0.59
F165	Resident voices grievances without reprisal	163	0.05
F166	NH resolves resident grievances timely	2,160	0.70
F167	Results of recent survey accessible	407	0.13
F168	Resident receives information from advocacy groups	15	0.00
F169	Resident may refuse to work	11	0.00
F170	Privacy of mail; receive and send unopened mail	242	0.08
F171	Resident has access to writing supplies and postage	3	0.00
F172	Access and visitation	176	0.06
F173	Ombudsman access to resident records	0	0.00
F174	Resident has access to a telephone	322	0.11
F175	Married couples may share a room in NH	7	0.00
F176	Resident self-administration of medication	449	0.15
F177	Resident may refuse certain transfers within NH	47	0.02
F201	Transfer and discharge requirements	670	0.22
F202	Documentation for transfer or discharge	612	0.20
F203	Resident provided notice before a transfer	2,088	0.68
F204	Resident prepared and oriented for transfer or discharge	990	0.32
F205	Resident notified of bed-hold policy and readmission	817	0.27
F206	Resident return to NH after bed-hold period expires	387	0.13

Appendix C (continued)

F-Tag	Citation Description	Number of Times Issued	%
F207	Residents have equal access to quality care	20	0.01
F208	NH admission policy requirements	45	0.01
F221	Physical restraints	2,117	0.69
F222	Chemical restraints	187	0.06
F223	Resident abuse	3,359	1.10
F224	Resident neglect; misappropriation of resident property	3,404	1.11
F225	Proper background checks for NH staff members	15,493	5.05
F226	NH policies and practices for maltreatment	9,919	3.23
F240	Quality of life	256	0.08
F241	Dignity in receiving care or services	6,954	2.27
F242	Resident self-determination/participation in decisions	1,173	0.38
F243	Participation in resident and family councils	42	0.01
F244	NH listens and responds to resident and family councils	459	0.15
F245	Resident participation in chosen activities	23	0.01
F246	Accommodation of resident needs	3,906	1.27
F247	Notice given to resident of room or roommate change	266	0.09
F248	Activities meet resident's needs	1,333	0.43
F249	NH activity director qualifications	182	0.06
F250	Social services provided in the NH	3,235	1.06
F251	NH social worker qualifications	91	0.03
F252	Safe and clean homelike environment in NH	1,796	0.59
F253	Housekeeping and maintenance	5,983	1.95
F254	Clean bed and bath linens	634	0.21
F256	Adequate and comfortable lighting	82	0.03
F257	Comfortable and safe temperature	406	0.13
F258	Comfortable sound levels	159	0.05
F271	Physician orders for resident care upon admission	269	0.09
F272	Comprehensive resident assessments	5,088	1.66
F273	Comprehensive admission assessment	308	0.10
F274	Significant change assessments (14 days)	503	0.16
F275	Annual assessments	79	0.03
F276	Quarterly review assessments	461	0.15
F278	Accuracy of assessments	2,105	0.69
F279	Comprehensive care plans; use of assessments in plans	8,999	2.93
F280	Resident right to participate in care planning/treatment	4,832	1.58
F281	Professional standards of quality	14,953	4.88
F282	Qualified individuals providing care and services in NH	7,700	2.51

Appendix C (continued)

F-Tag	Citation Description	Number of Times Issued	%
F283	Contents required in discharge summary	193	0.06
F284	Post-discharge plan of care requirements	385	0.13
F285	Coordinating assessments; PASRR screening for MI/DD	223	0.07
F286	NH maintains all residents assessments (15 months)	195	0.06
F287	Electronic data requirements; data processing	88	0.03
F309	Quality of care	21,204	6.92
F310	Resident ADL do not diminish unless unavoidable	209	0.07
F311	Appropriate treatment and services for NH residents	884	0.29
F312	Resident receives necessary services for individual needs	7,644	2.49
F313	Resident vision and hearing treatment	177	0.06
F314	Pressure sores (ulcers)	9,908	3.23
F315	Urinary incontinence	4,773	1.56
F317	No unavoidable decrease in range of motion	71	0.02
F318	Treatment and services for limited range of motion	1,324	0.43
F319	Treatment and services for mental/psychosocial issues	875	0.29
F320	No unavoidable decrease in mental/psychosocial health	41	0.01
F321	Use of naso-gastric tubes (deleted; merged with F322)	9	0.00
F322	No unavoidable use of naso-gastric tubes	1,376	0.45
F323	Accidents and supervision; environmental hazards	28,259	9.22
F325	Acceptable nutrition status for residents; therapeutic diets	2,795	0.91
F327	Sufficient hydration provided to residents	2,015	0.66
F328	Treatment/care for special needs (e.g., injections, fluids)	2,988	0.97
F329	Residents not given unnecessary drugs	4,678	1.53
F332	NH medication error rate not 5% or greater	2,027	0.66
F333	Residents are free of significant medication errors	4,728	1.54
F334	Influenza and pneumococcal immunizations	614	0.20
F353	Sufficient nurse staffing in NH	2,674	0.87
F354	Registered nurse staffing; director of nursing in NH	958	0.31
F355	NH waiver for nursing services	0	0.00
F356	NH requirements to post nurse staffing information	820	0.27
F360	NH residents provided with diet for individual needs	187	0.06
F361	Staffing of qualified dietitian in NH	138	0.05
F362	Sufficient dietary staffing in NH	213	0.07
F363	Menus meet nutritional needs of residents	1,371	0.45
F364	Palatable food prepared at the proper temperature	2,319	0.76
F365	Food meets individual resident needs	615	0.20
F366	Food substitutes offered to residents (nutritional needs)	264	0.09

Appendix C (continued)

F-Tag	Citation Description	Number of Times Issued	%
F367	Therapeutic diets prescribed by physician	641	0.21
F368	Frequency of meals (three times per day); snacks	534	0.17
F369	Assistive eating devices provided to residents	106	0.03
F371	Food stored/prepared/served in sanitary conditions	4,705	1.53
F372	Garbage disposed of properly	331	0.11
F373	Requirements for paid feeding assistants in NH	27	0.01
F385	Residents under care of physician; supervision of care	360	0.12
F386	Duties of physician for resident care	444	0.14
F387	Frequency of physician visits for residents	613	0.20
F388	Requirements for a substitute on a physician visit	69	0.02
F389	Availability of physician for emergency care	53	0.02
F390	Physician delegation of tasks in SNF/NH	6	0.00
F406	Requirements; specialized rehabilitative services in NH	753	0.25
F407	Qualified personnel for specialized rehabilitative services	31	0.01
F411	SNF assists residents in obtaining necessary dental care	262	0.09
F412	NH assists residents in obtaining necessary dental care	162	0.05
F425	Pharmacy services; medications provided to residents	5,429	1.77
F428	Frequency of resident drug regimen review (monthly)	1,243	0.41
F431	Labeling and storage of drugs/biologicals in NH	2,872	0.94
F441	Infection control program in NH	9,381	3.06
F454	Physical environment; life safety from fire	265	0.09
F455	Emergency electrical power system	33	0.01
F456	Maintain equipment in NH in safe operating condition	1,042	0.34
F457	Limit on number of residents in one bedroom (4)	5	0.00
F458	Square footage of bedrooms (per resident)	93	0.03
F459	Bedrooms have direct access to exit corridor	2	0.00
F460	Bedrooms ensure visual privacy for each resident	119	0.04
F461	Bed/floor/furniture/window requirements of bedrooms	48	0.02
F462	Resident rooms have toilets or are close to toilets	5	0.00
F463	Resident call system	792	0.26
F464	Designated room(s) for resident dining and activities	112	0.04
F465	Safe/functional/comfortable/sanitary environment in NH	2,425	0.79
F466	Backup water supply for NH residents	48	0.02
F467	NH has adequate outside ventilation	278	0.09
F468	Corridors have handrails on both sides	123	0.04
F469	Pest control program in NH	1,618	0.53
F490	Administration of NH is effective	2,560	0.83

Appendix C (continued)

F-Tag	Citation Description	Number of Times Issued	%
F491	NH is licensed under applicable state law	3	0.00
F492	NH complies with all laws and professional standards	1,541	0.50
F493	NH has a governing body; required training of CNAs	458	0.15
F494	Requirements for substitute CNAs in NH	213	0.07
F495	Competency of CNAs in NH	142	0.05
F496	Registry verification of CNAs before working in NH	344	0.11
F497	Regular continuing education for CNAs	641	0.21
F498	Proficiency of CNAs in NH	2,460	0.80
F499	Licensure, certification, and registration of NH staff	416	0.14
F500	Use of non-staff member to provide services to residents	273	0.09
F501	Designated medical director for NH; responsibilities	507	0.17
F502	Laboratory services provided for residents	1,994	0.65
F503	Requirements of laboratory services provided within NH	23	0.01
F504	Laboratory services provided at direction of physician	185	0.06
F505	Physician promptly notified of laboratory findings	708	0.23
F506	NH assist in transportation to off-site laboratory services	15	0.00
F507	Laboratory reports filed in resident clinical record	173	0.06
F508	Radiology and diagnostic services provided for residents	288	0.09
F510	Radiology services provided at direction of physician	26	0.01
F511	Physician promptly notified of radiology findings	85	0.03
F512	NH assist in transportation to off-site radiology services	11	0.00
F513	Radiology reports filed in resident clinical record	56	0.02
F514	Maintenance of resident clinical records	11,383	3.71
F515	Retention periods for resident clinical records	62	0.02
F516	NH prevent disclosure/loss of clinical record information	157	0.05
F517	NH disaster preparedness plans and procedures	116	0.04
F518	NH trains staff in disaster preparedness plans	233	0.08
F519	Transfer agreements for NH and local hospital	16	0.01
F520	NH maintains a quality assurance/assessment committee	1,401	0.46
F522	NH disclosure of ownership	40	0.01
	Totals	306,628	100.00

Note. SNF = skilled nursing facility. NH = nursing home. PASRR = Pre-admission Screening and Resident Review. MI = mental illness. DD = developmental disability. ADL = activities of daily living. CNAs = certified nursing assistants. Descript adapted from Federal regulations and the American Health Care Association (AHCA) Long-Term Care Survey Guide (November 2012 edition). Data for table derived from the complaint investigation dataset.