Data for Improvement and Clinical Excellence

Final Research Report

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Researcher Lead:
Dr. Kimberly Fraser, Rn, Phd
Assistant Professor, University Of Alberta

Decision Maker Lead:
Corinne Schalm, Msg, Mpa, Fcchl
Director, Access And Innovation,
Continuing Care, Alberta Health
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Co-investigators:
Dr. Anne Sales  
*Professor, University of Michigan*

Dr. Carole Estabrooks  
*Professor, University of Alberta*

Dr. Lili Liu  
*Professor, University of Alberta*

Dr. Sharon Warren  
*Professor, University of Alberta*

Dr. Wendy Duggleby  
*Professor, University of Alberta*

Dr. Shannon Spenceley  
*Assistant Professor, University of Lethbridge*

Dr. Colleen Maxwell  
*Professor, University of Waterloo*

Lynne Mansell  
*Alberta Health Services, Provincial, AB*

Barbara Proudfoot  
*Alberta Health Services, Provincial, AB*

Glenda Stein  
*Alberta Health Services, Calgary Zone, AB*

Wendy Harrison  
*Alberta Health Services, North Zone AB*

Edythe Andison  
*Good Samaritan Society, Edmonton, AB*

Gil Rueck  
*Good Samaritan Society, Edmonton, AB*

Decision maker partners:
Iris Neumann  
*CapitalCare, Edmonton, AB*

Thorsten Dueble  
*CapitalCare, Edmonton, AB*

Marian Anderson  
*Shepherd’s Care Foundation, Edmonton, AB*

Suzanne Maisey  
*Shepherd’s Care Foundation, Edmonton, AB*

Beth Wilkey  
*Alberta Health Services, Edmonton Zone, AB*

Lynne Mansell  
*Alberta Health Services, Provincial, AB*

Barbara Proudfoot  
*Alberta Health Services, Provincial, AB*

Glenda Stein  
*Alberta Health Services, Calgary Zone, AB*

Wendy Harrison  
*Alberta Health Services, North Zone AB*

Edythe Andison  
*Good Samaritan Society, Edmonton, AB*

Gil Rueck  
*Good Samaritan Society, Edmonton, AB*

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KEY IMPLICATIONS FOR DECISION MAKERS

Audit and feedback as a quality improvement mechanism has been shown to have modest effects. This study supports the evidence in this regard. Translating data into usable knowledge for quality improvement could lead to better client/resident outcomes. However, organizations are not equipped with resources, structures, or processes to do this in a timely or sustainable manner. This finding is not unique to Alberta. Increasing demands and quality requirements such as reporting mechanisms and accreditation processes tax resources available within organizations. However, using actual client-based indicators could help organizations to provide better care. While the data are available with the use of the standardized Resident Assessment Instrument in Long Term Care, Home Care, and Supportive Living, these data are not easily translated into knowledge that organizations can use to improve care.

Key points:

1. The Resident Assessment Instrument is a tool that results in standardized data that could be used to assess and improve client safety and quality of care.
2. The Resident Assessment Instrument is implemented in all three streams of continuing care in Alberta: Long Term Care, Home Care, and Supportive Living.
3. The Continuing Care Desktop is a virtual desktop accessible to Continuing Care health providers and managers in Alberta that could be a mechanism to share knowledge with every health care provider in Continuing Care in Alberta; however, at this point it is not used effectively.
4. Leadership at all levels of an organization is crucial to the success of an audit and feedback intervention.
5. Champions support the implementation and spread of quality improvement interventions such as audit and feedback by engaging teams and supporting others.
6. Users (aka health care providers, managers, administrators, decision-makers and other leaders) at all levels of an organization can understand and use audit and feedback reports.
7. Resources, structures, and processes need to be built into existing systems to translate client-based data into usable knowledge.
8. Sustainability of quality improvement activities such as audit and feedback is necessary to measure both short term and longer term effects of these kinds of interventions.
9. Lessons learned about implementing audit and feedback mechanisms need to be shared broadly so others can learn from them as best practices are developed and implemented across organizations and health systems. These lessons may support better resources, structures, and processes to sustain quality improvement activities such as audit and feedback.
EXECUTIVE SUMMARY

Audit with feedback has received considerable attention as one intervention that has been tested as a strategy to implement evidence-based practices in healthcare, including continuing care environments. When used as a quality improvement strategy, timely, targeted, and relevant feedback that is linked to important outcomes of care has been shown to be moderately effective. In Alberta, the Continuing Care sector is comprised of three streams: Long Term Care, Home Care, and Supportive Living. Two challenges facing continuing care are workforce composition and resource scarcity. In Alberta, 70% of Long Term Care nursing staff are health care aides (HCAs), with relatively little formal education, whereas only 17% are registered nurses (RNs)(Dunn, 2005). Other professional staff, including physicians, rehabilitation professionals, social workers, and pharmacists, provide services in continuing care settings in widely varying numbers. There are few educational resources, which is one method of responding to the lack of formal education, despite the increasing complexity of resident care needs(Wagner & Rust, 2008). Although the context, including staff mix, differs between Long Term Care, Home Care, and Supportive Living, similar issues plague these settings. One issue is that there has been a lack of standardized information available to care providers and administrators to support quality and safety of care for continuing care clients.

The aim of the Data for Improvement and Clinical Excellence (DICE) Program was to improve quality and safety in continuing care in Alberta. Continuing care consists of three streams: Long Term Care (LTC), Home Care (HC), and Supportive Living (SL).

Our primary purposes were:

1) To determine how Resident Assessment Indicator (RAI) data can be used within organizations and how the organizational context interacts with use of data;

2) To assess the effectiveness of a feedback intervention delivering RAI data to different provider groups within continuing care organizations.

DICE built on the Knowledge Brokering Group project (funded by CHSRF 2004-2007). This work created linkages among decision-makers in LTC organizations, and stimulated ongoing exchange between researchers and decision-makers at regional and provincial levels. These linkages have grown and continue to stimulate ongoing researcher/decision-maker collaboration in Continuing Care.

Current evidence suggests that more intensive, tailored, and targeted use of RAI data can improve processes and quality of care in continuing care settings. The RAI is a suite of 11 instruments developed by InterRAI, an international consortium of researchers (http://www.interrai.org). In our work, we used data from two of the RAI instruments: RAI-MDS 2.0 (Resident Assessment Instrument-Minimum Data Set, version 2.0) and the RAI-HC (Resident Assessment Instrument-Home Care). These instruments are standardized, valid assessment tools and are mandated for use by Alberta Health, the provincial health ministry. Every client within Continuing Care receiving publically funded health care is assessed and/or reassessed using these instruments. Most other jurisdictions across Canada have also mandated the use of the InterRAI instruments in various health care sectors. In brief,

The RAI instruments capture essential information about the health, physical, cognitive, and functional status of seniors(Morris et al., 1990) (Carpenter et al., 1999) (Hirdes et al., 1999) (Fries et al., 1997; Fries, Schroll et al., 1997; Hawes et al., 1995; Hirdes et al., 1999; Hirdes, 1999; Hirdes, 2006; Morris et al., 1997). They offer an opportunity to use existing data, standardized across organizations, to improve the quality of continuing care(Carpenter et al., 1999; Hirdes et al., 1999; Hirdes, 1999).
These instruments are integrated into workflow and care processes, generating individual resident or client care plans that provide the basis for interdisciplinary care planning.

Since the introduction of RAI data in continuing care environments it has become feasible to assess many aspects of the safety and quality of care received by residents and clients, and to use these data to improve care.

Although RAI data make this feasible, the data are not yet being used in most organizations to manage quality and safety.

One goal of the DICE program is to be a catalyst for organizations to begin to use data for safety and quality in continuing care. Following a systematic literature review, we implemented a quality improvement intervention: audit and feedback in all three streams of continuing care in Alberta. This is the first study of this kind and this magnitude that we are aware of in Alberta and perhaps in Canada.

We measured the continuing care organizational context in Alberta using the Alberta Context Tool (ACT). The tool was administered pre and post intervention in all settings that took part in this study.

We selected five quality indicators based on the RAI, and relevant to each stream of Continuing Care, as key targets for the intervention. Single page, double sided feedback reports were generated using resident data for each of the five indicators from the RAI. Graphs and bulleted text were used to illustrate the information.

We delivered the feedback intervention to various health care provider groups in the participating LTC facilities, HC offices and SL sites across Alberta. We followed up with a post-intervention survey one week after the report was distributed to assess health care providers’ perceptions of the reports and behaviors following report distribution. Surveys were administrated either in hard copy hand delivered by the research team or electronically to four selected SL sites (at a distance from the research team) through the Continuing Care Desktop (CCD). Providers could view and fill out the survey online after logging into their CCD accounts.

Qualitative segments followed sequentially after the quantitative work and included focus groups, interviews, and observations to complement the findings we obtained from survey data. Both staff outcomes and resident outcomes were measured. The staff outcome measures included any change in organizational context before and after the intervention using the ACT data and tracking staff’s responses to the post feedback surveys over time with regard to the usefulness of the report and intent to change their practice. Client outcomes included change to quality indicators over time as a result of the intervention. Various analyses are both completed and ongoing as a result of this research. We have both published and presented findings over the course of this work and will continue to do so. Additional resources and links to our work are offered at the end of the report. We will continue to update our publications with CFHI as they become available.
## Table 1: Study Design and Approach

<table>
<thead>
<tr>
<th>STUDY FOCUS</th>
<th>DESIGN</th>
<th>SAMPLE</th>
<th>APPROACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can data be used for process and quality improvement in LTC and HC?</td>
<td>Systematic Review</td>
<td>Key word search using established and relevant databases such as MEDLINE, CINAHL, EMBASE, the Cochrane Library, PsychINFO. Final included=24</td>
<td>Review of literature meeting the following criteria: (1) LTC facility or HC setting, (2) intervention designed to improve quality or process of care, and (3) use of standardized data in the intervention.</td>
</tr>
<tr>
<td>Audit with feedback intervention</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>resident/client outcome</td>
<td>Interrupted time series design</td>
<td>9 nursing units</td>
<td>7 sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,605 resident assessments in a 25-month period</td>
<td>11 sites</td>
</tr>
<tr>
<td>staff outcome</td>
<td>Longitudinal survey</td>
<td>1,080 responses in 8 surveys</td>
<td>300 responses in 4 surveys 120 responses in 4 surveys</td>
</tr>
<tr>
<td>Usefulness and application of audit and feedback in care decisions and practice</td>
<td>Focus groups to follow-up on survey findings (i.e. QUANT→qual)</td>
<td>2 sites 4 groups with a total of 28 participants</td>
<td>Not done</td>
</tr>
<tr>
<td>Context</td>
<td>Exploratory pre- and post-feedback report intervention</td>
<td>9 sites pre: 167 participants post: 152 participants</td>
<td>11 sites pre: 99 participants post: 82 participants</td>
</tr>
</tbody>
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<tr>
<th>LTC</th>
<th>HC</th>
<th>SL</th>
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<tbody>
<tr>
<td>9 nursing units</td>
<td>7 sites</td>
<td>11 sites</td>
</tr>
<tr>
<td>3,605 resident assessments in a 25-month period</td>
<td>3,270 client assessments in a 22-month period</td>
<td>872 client assessments in a 22-month period</td>
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<tr>
<td>1,080 responses in 8 surveys</td>
<td>300 responses in 4 surveys</td>
<td>120 responses in 4 surveys</td>
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<tr>
<td>Measures of client outcomes according to RAI quality indicators</td>
<td></td>
<td>Administration of post- feedback report survey</td>
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<tr>
<td>Focus group discussion</td>
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</table>
Top Recommendations are made on the basis of this research:

Quality Improvement activities, including audit and feedback, need to be embedded in existing structures and processes for sustainability.

To carry out quality improvement, knowledge translation, or practice improvement activities in an effective, sustainable way requires dedicated resource allocation. Resources need to be appropriately allocated to enable provider organizations to not only implement, but to sustain quality improvement activities if we expect them to truly affect client health care outcomes.

The RAI Instruments provide a standardized data set from which to base quality improvement activities that are relevant to our end user: the client or resident. These data are a rich resource within our health care system. However, specific resources to assist organizations and the health system to be able to use this data in a timely, targeted way are required.
DATA FOR IMPROVEMENT AND CLINICAL EXCELLENCE (DICE): THE RESEARCH PROGRAM

The following acronyms are used in this report: Data for Improvement and Clinical Excellence (DICE); Resident Assessment Instrument (RAI); Registered Nurse (RN); Health Care Aide (HCA); Long Term Care (LTC); Home Care (HC); Supportive Living (SL); Alberta Health Services (AHS); Alberta Context Tool (ACT); and Continuing Care Desktop (CCD).

Context

The intent of the Data for Improvement and Clinical Excellence (DICE) Research Program is to implement and evaluate a quality improvement intervention in continuing care across Alberta. Continuing care environments in most jurisdictions are challenged to deliver quality, safe care within the context of resource constraints. The Donabedian framework identifies that, to understand care quality, one must consider structures, processes, and outcomes and that, within complex health care contexts, providers do the best that they can to deliver good quality care consistent with current knowledge (Donabedian, 1988)(Donabedian, 2005).

In the DICE study, we wanted to provide information to continuing care staff based on their routinely collected assessment data, available from a continuing care structure: the Resident Assessment Instrument (RAI) system. Structures can both constrain and facilitate quality care. In our study, we created an additional structural component, which we introduced into the clinical environment: feedback reports based on RAI data. Staff activities and service delivery are examples of processes; outcomes are events experienced by residents, clients, staff, organizations, or even systems of care. Over the course of the DICE study, we measured pertinent processes (provider perceptions of intention to change behavior and of behavior change (Eccles, M.P., Hrisos, S., Francis, J., Kaner, E.F., Dickinson, H.O., Beyer, F., Johnston, M., 2006) and outcomes (e.g. pain, falls, etc.) that we anticipated to change with the introduction of the feedback report.

RAI data can greatly facilitate introduction of quality improvement interventions in continuing care; in the DICE study, we used RAI data to create feedback reports, and to measure resident and client outcomes over time. But despite the widespread availability of the RAI data, it has seen only limited use in order to stimulate quality improvement (Aud, Rantz, Zwygart-Stauffacher, & Manion, 2004; Grando, Rantz, & Maas, 2007; Newland, Wipke-Tevis, Williams, Rantz, & Petroski, 2005; Rantz & Zwygart-Stauffacher, 2004; Rantz et al., 2004; Rantz, Zwygart-Stauffacher, & Flesner, 2005; Rantz et al., 2006; Scott-Cawiezell et al., 2006).

Intensive, targeted, timely, and specific feedback linked to outcomes of care that are relevant to the setting of interest have shown promise for improving care (Hysong, Best, & Pugh, 2006; Jamtvedt, Young, Kristoffersen, O’Brien, & Oxman, 2006). However, questions remain about whether audit and feedback will work in continuing care. Despite the large number of studies (over 80 audit with feedback trials since 2005), we do not know how different provider groups respond to feedback, and different levels of education and professionalization may affect their responses or their perspectives about quality of care (A. Sales, Moscovice, & Lurie, 1996). This is an important issue for quality improvement in continuing care where provider education levels vary widely, and a large proportion are unregulated Health Care Aides (HCAs) whose ability to provide safe care, consistent with evidence-based practice, has also been questioned (Dunn, 2005). In the pre-DICE pilot study, provider groups rated the importance of care domains for quality improvement and reported their intention to change behavior when shown a prototype feedback report. While the highest domains showed some overlap, we did find that the ratings differed markedly between provider groups.
Research questions:

1. How can Resident Assessment Instrument (RAI) data be used within organizations and how does the organizational context interact with data use?
2. What is the effectiveness of a RAI-based feedback intervention among different provider groups within continuing care organizations?

Implications

Tailored and targeted use of RAI data are believed to lead to improvements in processes and quality of care in continuing care settings. Our systematic approach to assessing current data use through a literature review and building on the use of a well-tested quality improvement method, audit with feedback, has potential to improve care quality. Similar to previous research, the findings from this study showed that timely, targeted, relevant feedback, linked to important outcomes of care, was moderately effective as a stand-alone intervention to improve care. However, the challenge for organizations is in creating structures that are sufficiently resourced to first, turn data into usable, practice-based knowledge and second, to create sustainable processes for using that knowledge at various levels within health care organizations: at the level of the clinician, the unit, the organization, and the system.

DICE was comprised of several distinct yet interrelated studies and each of these will be reported on sequentially below. We will describe the approach, results, and further research arising from each study. Following the report of each study we will share other additional resources and provide a reference list.

Study 1: The Use of Data for Process and Quality Improvement in Long Term Care and Home Care: A Systematic Review of the Literature

Approach

We assessed data use through knowledge synthesis of existing literature to examine how RAI data and closely related types of data were used in organizations across multiple jurisdictions. We searched several databases, including PubMed, the Cochrane Library, EMBASE, CINAHL, PsychInfo and Sociofile, using the following search terms: quality improvement, process improvement, long term care, continuing care, home care.

Results

We identified 713 studies. Our criteria resulted in 24 studies being included. Our results are reported according to design and quality, type of intervention, how data were used, setting, and process improvement model. Study design and quality varied. In our review, we deemed an intervention successful if there was improvement in most outcomes regardless of statistical significance and regardless of the main outcome under study. 19 of the 24 studies reported successful interventions. A process intervention model was used in 10 studies, a combination of models was used in 8 studies, guideline implementation was the intervention in 5 studies and one was an educational intervention. The data used included RAI data (11 studies), OASIS data (9 studies), system-level data used for benchmarking (3 studies), and quality indicator data established by the Joint Commission on Accreditation of Health Care Organizations (one study). The settings included long term care (LTC) (14 studies) and home care (HC) (10 studies). One study was in Sweden, one did not report the site, and the remaining 22 were in the United States.
In terms of models used, only 10 studies used a defined process improvement model. Six of these used the Plan-Do-Study-Act Cycle, 3 cited Continuous Quality Improvement, one used Six Sigma, a model originating in the business field but seen more frequently in health care in recent years. Of the studies that reported a model, 9 were in HC and one was in LTC. RAI data was used in only one study while OASIS was used in 8. Six of these studies reported improvements in at least one outcome. All 10 of these studies used a pre-/post-intervention design. The specific intervention approaches within the models included audit with feedback, consultation, academic detailing, coaching, education, workshops, teleconferences, meetings, collaboration, and development of strategies and tools. Guidelines or protocol implementation was the intervention in five studies and education on a specific care process was the intervention in one study.

We concluded that although the continuing care sector has generally not been funded to support quality improvement activities, research, or information management, an opportunity may exist with the introduction of standardized assessment using standardized tools that result in standardized data. So, while data may have improved, an organization's ability to effectively use that data has not.

**Further Research**

Increased research and innovative strategies are needed to determine how to use data for quality improvement in continuing care. Researchers and clinicians responsible for quality improvement could draw on the evidence in this review as we were able to categorize approaches for quality improvement using standardized data. A categorization such as this is a resource that has not previously been available. Although we have more standardized data available to us in continuing care in Canada than ever before, it does not automatically translate into usable knowledge. Governments, researchers, and research funding bodies need to support continued, and perhaps expedited, research on how to enable practitioners and health care leaders to use data to improve quality of care and, ultimately, quality of life for residents and clients. This paper is published in the Journal of the American Medical Directors Association (A. E. Sales et al., 2012).

**Study 2: Audit and Feedback Intervention in 3 continuing care streams**

*Phase 1 - Long Term Care (LTC), Phase 2 - Home Care (HC) and Supportive Living (SL)*

**Approach**

We took a systematic approach to using data and assessing priorities from the perspective of multiple provider groups to develop and deliver an audit with feedback intervention over time in three Continuing Care streams in Alberta, Canada: Long Term Care (LTC), Home Care (HC), and Supportive Living (SL). We implemented DICE in 9 units in 4 LTC facilities, 7 HC offices and 11 SL sites across all 5 Alberta Health Service (AHS) Zones. The key difference among LTC, HC and SL is the diversity of environments where care is delivered.

Following current practice in Alberta, LTC is the term adopted to describe nursing home, auxiliary hospital or facility care. Among the four Edmonton Zone LTC facilities in our study, two facilities were affiliates of AHS and the other two were operated by a faith-based non-profit.

Two out of the four LTC facilities were among the first to implement RAI 2.0 in Edmonton, Alberta. The other two implemented the RAI later, but it had only been implemented for a year when our study commenced.
Phase 1 - Long Term Care (LTC)

Context

This particular study occurred in 9 units of four LTC sites owned by two organizations who deliver LTC in the province of Alberta. The intervention occurred over thirteen months.

Approach

During a prior pilot study, the research team determined the top priority quality indicators in two LTC facilities in Edmonton, Alberta. We used a similar approach to the pilot study and asked staff members from each of the provider groups (i.e., RNs/Licensed Practical Nurses, HCAs, allied health professionals) to complete a survey listing quality domains from data available from RAI 2.0. We averaged ratings of importance for quality improvement for each domain for each provider group, and selected the top five rated domains for each group to develop feedback reports (Appendix A).

The monthly feedback report was the intervention. We hand-delivered the feedback reports to staff on each unit. A week later we administered post-intervention surveys to assess staff response to the report. The quality indicators chosen for the reports used in LTC were pain frequency and intensity, risk for and occurrence of falls, and depression prevalence, all aggregated to the unit level.

Following ethics and operational approval, we requested and received RAI 2.0 data from the data vendor for each of the LTC organizations. The data were aggregated to the unit level and were used to generate the reports according to each quality indicator selected. Reports were primarily graphic with minimal text bullets, on one sheet of paper front and back, and printed in color. A different quality indicator was illustrated in each graph and unit scores reflecting each quality indicator were generated and were compared to other units in the study.

The intervention occurred over a thirteen month period. One week after each intervention we administered a post-intervention survey to assess how staff responded to the feedback intervention. Each feedback report (the intervention) was specific to the unit. Direct care providers from all disciplines, as well as managers, in each unit took part. Two research assistants hand delivered feedback reports directly to providers who were working at the time of their unit visit. Reports were put into mailboxes or left in break rooms for staff not working during delivery cycles. While one research assistant distributed the report, the other research assistant observed and recorded staff behavior as they received reports. The observer counted occurrences of specific behaviors including whether or not the staff member read the report immediately, put it in their pocket, or engaged in some other activity.

Uptake of the intervention was assessed through analysis of observed behaviors during feedback report delivery and self-reported behavior based on the post-intervention surveys administered one week after the intervention. Extra reports and packages were consistently provided on the unit for staff who weren't available on both intervention and feedback survey distribution days. The package included a copy of the feedback report of the month, a post-intervention survey, instructions on how to complete the survey, as well as a stamped return envelope for mailing the survey back to the research team.

Our post-intervention survey is 10-pages long and is composed of three sections. The first section focuses on demographic information such as position title and length of time working in continuing care. The second section focuses specifically on the intervention such as uptake of the feedback including whether or not they received, read, and understood the feedback report. We also had
questions focused on their daily practice to improve care to individual residents and what kinds of actions were taken. The last section of the survey was intended only for direct care providers and focused on the intent to change their behaviour. In this section we focused specifically on behaviors related to pain in the residents they care for. The survey took about 15-20 minutes to complete.

Based on our analysis as well as feedback from the study participants, we made refinements to our approach to further explore uptake and usefulness of the intervention. This was necessary as the survey responses brought a few more questions to light that were best answered using a qualitative rather than quantitative approach. Our decision-maker partners were supportive of the suggested refinements and we were able to do focus groups with unregulated and regulated staff provider groups. The focus groups were an hour long with five to ten health care providers per group. We used a semi-structured focus group guide to direct the focus groups. The questions were derived to stimulate discussion and were based on the post-intervention survey findings.

**Long Term Care Results:**

**Staff outcomes**

From survey 1 to survey 8, our respondents varied between 101 and 201 and overall, we were able to gather 1,080 feedback report surveys across the 8 survey cycles (Appendix B). Our response rates based on survey completion also varied with the lowest rate in the middle of the intervention period (23%) and the highest at the end of the intervention period (45%). Our response rates were likely driven by two factors: conditions in the study sites and changes in our research assistant staff. One example of a study site situation that affected our data collection was an outbreak of an intestinal virus in one facility that left us with no other option but to leave the feedback reports and surveys with an authorized internal staff to complete distribution since our own staff were not permitted into the facility that month. We also experienced a considerable turn-over of research assistants during the first months of the intervention. This somehow affected the research team’s relationships with the staff and administrators in the study sites. However, the involvement of our decision-maker partners, who were also part of our study site leadership teams, was very helpful for us to carry out the rest of our data collection activities smoothly. Our research assistant staff regularized around the 5th survey cycle up to the end of the intervention period.

**Long Term Care provider response to the feedback intervention**

Seventy-nine percent of the respondents said they had read the reports. Most of them (78%) said they found the report understandable. However, a smaller proportion (64%) found the report useful overall. Generally, only 42% reported discussing the feedback report with another care provider.

We did not see any pattern in the trends for any of these elements about the feedback intervention but we observed variations across all the survey cycles. The proportion of respondents who said they read the report was high at the start of the intervention (93%) but declined after the 2nd survey, then settled between 70 and 80%. The same pattern has been observed for the proportion of respondents who said they understood the report although the proportion fell below 70% on the 6th survey. The proportion of respondents who said they found the report useful overall was initially at a relatively low level (49%) but steadily climbed up to its peak at 76% in survey 8, with a slight dipping in surveys 5 and 6. We observed noticeable fluctuations in the proportion of respondents who said they discussed the report with another staff member during the intervention period with the highest in survey 2 (54%), the lowest in survey 5 (32%), and the last survey with 41%.
Resident outcomes on specific indicators

Our pre-intervention segment had 6 monthly data points (July-December 2008), the intervention phase had 13 monthly data points (January 2009-January 2010) and the post-intervention observation period had 6 monthly data points (February-July 2010). All data were specific to the four quality indicators in our study: pain, depression, falls risk and actual falls. We also analyzed pressure ulcers, a control condition that we did not include in the report.

We used segmented regression to analyze the interrupted time series data.

In Appendix C, we describe the resident sample at four relevant time points: at the beginning of the pre-intervention period (July 2008); at the beginning of the intervention period (January 2009); at the end of the intervention period (January 2010); and at the end of the post-intervention period (July 2010). As would be expected among LTC residents, the majority were female and most were widowed.

We next show the data for the five quality indicators in the form of line graphs in Appendix D. Each graph has two lines - the solid line represents the actual data and the superimposed dashed line shows a cleaner picture of the trends. We indicate with arrows the beginning and end of the intervention period. Looking at the graph for pain, the change in pain level immediately after the intervention started was significant and negative, indicating that there was a decrease in the level of pain scores (i.e. less pain) at the beginning of the intervention. For depression, the overall slope was negative over time although the slope during the intervention was positive and significant, showing that depression scores increased during this period. This was opposite to our expectation. The same trend can also be noted during the intervention period for falls and risk of falls, although the positive slope for risk of falls was not significant. For pressure ulcers, there was a negative but insignificant change in prevalence of pressure ulcers at the beginning of the intervention period. We have expected no change in this outcome as it was not included in the feedback report.

In addition to the data included in the feedback reports delivered to participating units and facilities, we also requested data from the same period for three additional facilities, resident numbers per unit matched as closely as possible to the facilities participating in the study. These provided comparison data to control for secular trend over the pre-intervention, intervention and post-intervention periods. We analyzed pressure ulcer prevalence as an additional check on secular trends within the participating units. Analyses that include the control site data are currently underway.

Phase 2 - Home Care (HC) and Supportive Living (SL)

Context

The HC and SL phase was done following the LTC phase. The intervention was done simultaneously in HC and SL.

Home care programs offer services to a wide population of clients living in their own home, either in single family dwellings or congregate settings. Home care includes care and support for all ages for short-term illness like recovery from surgery, respite care, end of life care, and for longer term and maintenance needs. Professional services, including case management, are delivered by regulated AHS staff working out of geographically dispersed HC offices located in the 5 AHS Zones across Alberta. Regulated service providers included RNs, social workers, occupational therapists, physical therapists. Services delivered by unregulated providers, i.e. HCAs, are provided by either AHS or contracted third party organizations. In our study we only included data from long term clients who receive services for more than 90 days.
Another stream of continuing care included in our study was SL. Supportive living provides options for care when needs grow beyond what can be safely provided at home but varying levels of independence can be maintained. Clients may move to higher levels of SL when their needs change and they require greater levels of care. The 11 SL sites recruited in our study were all privately owned and operated, predominantly by faith-based organizations. The care was provided by the operator under contract with AHS and case management was provided directly by AHS.

The RAI-HC was implemented in HC and SL later than the RAI 2.0 in LTC. Of the 7 HC offices, 2 of the larger sites joined our audit and feedback intervention in the second quarter due to delayed RAI-HC implementation.

In the HC and SL Phase, we had only intended to access Edmonton, Central, and North Zones for the intervention. However, as the word of the research program spread, the research team was approached by providers and AHS leaders in the Calgary and South Zones to participate as well. Due to the travel and time this would require, we began searching for different options that could involve all 5 AHS Zones.

All publicly funded continuing care providers have access to the Continuing Care Desktop (CCD). The CCD is a provincial initiative that provides access to a virtual desktop. We determined that the CCD would enable us to have distance participation using electronic means, provided the participant had a CCD user name/password, and the site provided a champion for the study. We worked with the CCD provider, the Centre for Health Evidence, and the interested providers in the Calgary and South Zones to ensure everyone eligible to participate had an active CCD ID code.

In total, we had 7 HC offices and 11 SL sites from all 5 Alberta Health Services Zones across Alberta. Four were e-sites, two of which were from South Zone and two from Calgary. Our sites included Alberta Health Services HC programs and six SL operators.

**Approach**

**e-sites**

In the e-sites, a champion was selected who received an email notifying them that the report was available on the CCD. On login, the provider would select the icon to access the report. They could view the report in the moment, print it, or return later to review it. A week later the participant would be invited to fill out their feedback report online using Survey Monkey which was accessible through a link on their CCD.

Engagement was more difficult with the e-sites and follow-up procedures included three phone calls to the site champion who would remind staff to complete their post-intervention survey. Follow up phone calls occurred on the second, sixth, and twelfth week after survey delivery.

**In person sites**

The procedure for report distribution at in-person sites was similar to LTC but we decreased the intervention cycle from monthly to quarterly. This was for two reasons: 1) the frequency of RAI assessments in HC and SL, and 2) our experience in LTC. The RAI assessment is completed with residents in LTC on admission, quarterly, and annually. In HC and SL, it is completed on admission, annually, and when there is a significant change in health status. We observed participant fatigue with monthly reporting cycles in LTC. Both of these reasons predicated our decision to move our intervention to a quarterly cycle in HC and SL.
The quality indicators used in the feedback report

We implemented a slightly different approach to select the quality indicators for HC and SL. We selected a panel of six experts in HC and SL at provincial and regional levels and asked them to rank order the importance of several indicators. We initially prepared a list of twenty-two (22) quality indicators from the RAI-HC that we could potentially include in the feedback report. We then shortlisted seven (7) indicators that were of high importance from a clinical perspective.

The criteria the panel of experts used to make their decisions on indicators were:

a) what is known from the literature about what's important;
b) the strategic initiatives underway or likely to be initiated during the period of the project;
c) the comparability/similarity of the indicators to the three used in LTC;
d) what was useful to clinicians and;
e) where we would likely see changes.

The top four domains that received the most votes and that were selected for the feedback reports for HC and SL were delirium, falls occurrence, hospital visit (i.e., to emergency), and pressure ulcers. Pain prevalence was retained from the LTC setting as that was the indicator chosen to determine behavior change and we wanted to keep this indicator consistent across all sites.

In the feedback reports, we presented the percentages of clients with pain, a fall, delirium and hospital visits. If a client had more than one assessment in a quarter, we considered only the most recent assessment.

We generated the first feedback report using the most recent data for one full year divided into 4 quarters. In the succeeding reports, we added the subsequent available quarterly data. We distributed the reports quarterly over a one year period.

We revised the post-intervention survey to fit the HC and SL environment. That is, we changed terminology to reflect the setting (i.e., resident became client and shift became visit).

The differences in work contexts prohibited us from observing many providers receive and review the report in HC and SL. Because health care providers in HC go to clients’ homes to provide care, fewer were present at the sites when we distributed the reports unless we were able to be present at a scheduled staff meeting. We consistently tried to attend the sites when the majority of staff would be in the office. We presented the feedback report (intervention), answered questions, and asked them to fill out the survey a week later. Packages, similar to those used in LTC, were left for those who were not on site while the research team was present.

Though the four (4) feedback reports we distributed showed quarterly data, our analysis required more time points to model the study design. Therefore, we further subdivided our observation data into twenty-two (22) monthly points so that the pre-intervention segment had 6 months of data (i.e. December 1, 2010 to May 31, 2011), the intervention phase had 10 months of data (i.e. June 1, 2011 to March 31, 2012) and the post-intervention phase had 6 months of data (i.e. April 1, 2012 to September 30, 2012).
Considering the modifications we made, we also recalculated the quality indicators to consider only the most recent client assessment in cases where a client had multiple assessments for a particular month. This was a minor adjustment as the majority of clients would only have the routine assessment which is completed annually.

**Although data collection and analysis took place at the same time, all data were maintained specific to the continuing care stream, that is either HC or SL. Data analysis was done specific to each stream and results are specific to each stream. Results are presented by HC stream followed by SL stream below.**

**Home Care Results:**

**Staff outcomes**

We examined summary statistics over Survey Periods 1 to 4 for HC and SL. We calculated response rates as the number of providers in a given time period divided by the number of survey packages that we distributed over that same time period. Our estimate, however, excluded those that were completed on-line as we did not know how many unique individuals have logged in to the CCD desktop to complete the survey.

Compared to in-person sites, we had a very low response among the sites that received the reports and surveys electronically. Due to the nature of the context, response rates were difficult to calculate at the in-person sites as well. We left packages that contained the feedback report and the post-intervention survey, usually with the site champion, to ensure staff who were not available during our site visit would be able to participate. While our goal was to have the packages hand–delivered to individuals, this was not always feasible. Our efforts to calculate the number of packages that were actually taken by unique individuals were generally unsuccessful.

Our analyses in this report are mainly descriptive and included all data from both the in-person and e-sites. We present the demographic profile of our respondents, aggregated in total and discussed separately for HC and SL.

From the first to the last survey periods, we had 63 to 87 respondents in HC. The total number of surveys collected from all four survey periods is 300 (Appendix E). The response rates ranged from 46% to 56% where we noted the highest response rate in survey cycle 3 and the lowest in survey cycle 1.

The mean number of years the respondents had worked in HC ranged from 8.6 to 10.1 during the intervention period. In the same period, our participants had worked in the site from 7.5 to 8.8 years, on average. Our respondents were mostly care or case managers especially in survey cycles 2 (39%) and 3 (38%).

**Home Care provider response to the feedback intervention**

This section provides an overview of the providers’ responses to questions about the intervention.

In general, 87% of our participants had read more than half or all of the feedback report. About the same proportion (86%) understood more than half or all of the information included in the report. However, only about 43% said the report was useful overall and only 35% of providers found the report useful in making changes to the way they care for their clients. Among those, 39% said they desired changes in the way clients are assessed and 30% said they would like changes to the manner in which they assist clients in meeting their activities of daily living. Notably, nearly half (48%) of these
staff felt that they would not change client care practices but said the information could be useful to other care providers.

A little more than one-third of the providers (38%) reported that they discussed the report with another staff member. Most (73%) talked to a peer, i.e. someone else who does the same type of job as them. The usual reason why the majority of respondents (81%) talked about the report with a peer was to find out what others thought about it.

Of respondents, 35% said they discussed previous reports in staff meetings during the last quarter. The majority (90%) discussed the reports 1 to 3 times in staff meetings with a few saying they discussed the report 4-6 times.

Our results showed that nearly half (46%) of our respondents said that the information in the report reflected the clients in their site very well and 31% felt that the report showed that their site was doing better than others.

About half of the providers (52%) said that the report made them interested in other types of data and 54% said that the report prompted them to want other information. When the respondents were asked to specify the types of data they were interested in, 15% mentioned interest in data about hours of formal/informal care. In terms of other information that they wanted from the report, they wanted to know how other sites addressed similar kinds of concerns (60%) and about best practices for specific kinds of care for clients (54%).

Also in Appendix E, we describe the patterns in responses to elements in the feedback. At least 81% of providers had read more than half or all of the report from survey 1 to 4; the proportions were initially high in the first 2 surveys but sharply dropped in survey 3 and continued to steadily fall and hit a low in survey 4.

Throughout the intervention period, at least 84% of the respondents understood more than half or all of the report; but the proportions showed a gradual decline from survey 1 to survey 4.

About 50% of care providers in the 1st and last surveys said that the information in the report accurately reflected their site very well, but it bottomed out at 41% in the 2 middle surveys.

The proportion of providers who found the report useful overall stayed about the same in the range of 40-44% in all survey periods.

At the start of the intervention, one-fifth of providers felt that the report showed their site as doing better than others. It went up considerably in the 2 succeeding surveys, then slipped back from 44% in survey 3 to 30% in the last survey.

The proportion of respondents who said they discussed the report with another staff member started low at 30% and gradually rose to about 47% by the last survey. About one-third of the respondents in surveys 2 and 4 said they had discussed previous feedback reports in a meeting during the last quarter, and the proportion was slightly higher in survey 3 (41%).

The proportion of participants who said that the report made them interested in other types of data started relatively low (48%) then improved by 12% in survey 2, started to dip in the succeeding periods, and returned to 48% in survey 4. Just a little over half of the providers in each survey period
said that the report made them want other information. The proportion of providers who found the report useful to make changes in the way they cared for clients fluctuated moderately during the entire period, with the highest (41%) in survey 3 and the lowest at 27% in the last survey.

**Client Outcomes**

We summarized the age and gender profile of the HC clients included in the 22-month observation period (see Appendix F).

The average age of clients was almost the same each month and the proportion of female clients was consistently higher than males in the selected observation months.

We graph the time series data for each quality indicator and present them in Appendix G. The graph for pain demonstrates the change in pain level immediately after the intervention started was significant and positive, indicating that there was an increase in the level of pain scores (i.e. more pain) at the beginning of the intervention. This was counter to what we anticipated. However, the slope during the intervention period went down but was not significant; this same trend was seen for the falls indicator. For delirium and hospital visits, the slopes during the intervention period were both positive but not significant, indicating that there was an increase in the proportion of clients with delirium and in those requiring hospital visits. Again, this was not our expectation. For the pressure ulcer indicator, slopes during and after the intervention were generally going down but not significant. This was consistent with what we had presumed.

Based on the regression results for the five (5) quality indicators, we found out that the implementation of the feedback intervention in HC was not associated with the baseline trend and the change in the trend after intervention implementation. While we have seen variations in the patterns of changes in the quality indicators during the intervention period, we cannot make any conclusions at this point without completing the analysis of the other components of the project, which are still underway (e.g. what might be the responses of care providers to questions pertaining to intent to change behavior focusing on pain management and how these responses relate to the quality indicators).

**Supportive Living Results:**

**Staff outcomes**

We had a range of 11 to 44 respondents in SL with a total of 120 surveys collected over the one-year intervention period. The response rates ranged from 14% (survey 4) to 39% (survey 1).

The mean number of years our respondents had worked in SL ranged from 7.0 to 8.5 during the period of the feedback intervention. At the same time, our participants had worked in the site from 3.5 to 4.5 years on average. A large proportion of our respondents were HCAs, ranging from 64% to 82% across all 4 survey periods.

**Supportive Living provider response to the feedback intervention:**

We were able to gather 120 responses from our participants across the 4 survey periods (Appendix H). Overall, 87% of our participants had read more than half or all of the feedback report. The majority of them (81%) also understood more than half or all of it. Over half of the providers (59%) found the report useful overall and, in particular, 54% of the respondents said the report was useful in making changes in the way they cared for their clients. When asked to specify changes to care, the respondents said they desired to make changes in the way clients are assisted in their activities of daily living (39%)
and the way clients are assessed (30%). Markedly, 56% of these staff felt that they would not change client care practices but that the information could be useful to other care providers.

A little less than half of the providers (44%) said they discussed the report with another staff member. Most of them (76%) talked to their peers. The usual reason that the majority of these providers (82%) talked about the report to a peer was to find out what others thought about it.

Only 13% of the SL providers said they discussed previous reports in staff meetings during the last quarter. Of the 13% of respondents who discussed the report, 78% of them discussed it 1-3 times during the last quarter.

Our results also showed that nearly half (44%) of our respondents said that the information in the reports reflected their site very well and 33% of them felt that the report showed that their site was doing better than others.

Less than half of the providers said that the report made them interested in other types of data (47%) and made them want other information (43%). Other types of information they were interested in included comparisons across sites, which was most frequently mentioned. Other information that respondents wanted was to know about best practices for specific kinds of care for clients.

Also in Appendix F, we describe the response patterns regarding elements in the feedback report. At least 83% of providers read more than half or all of the report from surveys 1 to 4. The proportion was initially high then negligibly declined in the 2 subsequent surveys. In the last survey, all the respondents had read the report, but it is important to note that only 11 completed the survey in the last quarter in SL.

Throughout the intervention period, at least 77% of the respondents understood more than half or all of the report. The proportions fluctuated considerably with the highest proportion noted in survey 4 and the lowest at 77% in surveys 1 and 3.

The proportion of care providers who said that the information in the report accurately reflected their site notably varied in the 4 survey periods from as low as 29% in survey 3 to 73% in survey 4. A little above 50% found the report useful overall in the first 3 surveys but sharply climbed and reached a peak at 91% in survey 4. The relative number of participants who felt that the report showed their unit was doing better than others fluctuated from as small as 24% in survey 2 to 45% in survey 4.

At the beginning of the intervention period, almost half (48%) of the respondents said they discussed the report with another staff member. The proportion decreased by almost 20% in survey 2. After then, it started to go up and peaked at 64% in survey 4.

Initially in survey 2, the proportion of staff who said they had discussed previous feedback reports in a meeting during the last quarter was very small; only 1 person out of 29 participants in survey 2 provided this response. The proportion, however, climbed in the following periods and ended at 36% in survey 4.

The proportion of respondents who said that the report made them interested in other types of data started very high (70%) then dipped by about half in surveys 2 and 3 (32% and 37%, respectively) and hit a low at only 18% in survey 4. From 50% in survey 1, the proportion of providers who said that the report made them want other information was lower in the following surveys, with the lowest being noted at 34% in survey 3.
The proportion of providers who found the report useful to make changes in the way clients were taken care of fluctuated considerably during the entire period, with the peak in survey 2 at 61% and reaching a low of 45% in the last survey.

**Client Outcomes**

Appendix I describes the basic demographic information of the SL clients in our study. Average ages of the clients were almost the same in the 4 selected months and clients were predominantly female.

We graph the time series data for each quality indicator and present them in Appendix J.

Referring to the graphs for the 5 different quality indicators, there were no significant changes in level immediately after the intervention, but the change was negative for falls and pressure ulcers, indicating that there was a drop in the level of falls and pressure ulcer prevalence at the beginning of the intervention. This was our expectation. The slopes for the pain score, delirium, hospital visits and pressure ulcer indicators during the intervention period were negative. Though they were not significant, they were consistent with what we had expected.

**Qualitative Findings**

Based on our findings, a qualitative phase was implemented to better understand the inconsistency in staff responses to some questions in the survey. For example, we further explored why participants might find the report useful in spite of reporting a low level of understanding of the report. Various strategies were carried out in the three streams of continuing care. In LTC, focus groups in the participating facilities were conducted to further explore the understanding and usefulness of the feedback reports.

Guiding questions were derived based on our quantitative findings that needed further exploration. We specifically explored the perceived usefulness of the feedback reports and its impact on receiving feedback and the outcomes over time. Four focus groups were conducted in two of the four LTC facilities in Edmonton, AB in February 2011. There were 14 regulated and 14 unregulated health care providers who attended the focus groups.

When asked about usefulness, the front-line care providers thought the reports were useful as a comparison but could not see how this connected to their individual practice. They discussed many issues relating to workload and lack of resources that impact on their ability to provide quality care. In the focus group with best practice leaders and a care manager present, there was much more enthusiasm for the usefulness of the reports to impact resident care from the RNs, Licensed Practical Nurses, Occupational Therapists, and Social Worker present.

We planned to conduct 3 focus groups for regulated staff and two focus groups for unregulated in HC and SL after the intervention was completed in May 2012. We were able to complete two regulated health care provider focus groups. We were not able to complete any focus groups for unregulated providers in spite of significant efforts. The primary two reasons causing difficulty to complete focus groups with unregulated care providers in both HC and SL were work schedules and other organizational priorities.

However, in the focus groups that we did complete, the participants said they were happy to be asked to participate in the DICE program. They told us that the feedback reports helped with their understanding of their client population and lead to increased critical thinking about quality of
care and client outcomes. They perceived that comparison of client conditions in one home care site to other sites was important to know and was a useful measure. They had not seen any client data presented the way they were in the feedback reports until participation in this study. Seeing the data represented in this manner not only helped them change their perspectives and touch upon universality of problems across home care sites (“It’s not just us”), but also gave them a sense of accomplishment when they saw improvements in their clients’ conditions based on their RAI data. There may be further education needed about RAI assessments, the data that can be collected, and outputs that are available (as providers who do not do RAI assessments are not as familiar with the data and outputs as those who do assessments). The information that can be derived from the RAI is not only useful for client care but also for practice improvements. Ways to translate RAI information into usable formats in a timely manner would be valued by participants. There was curiosity about the availability of further feedback reports beyond the DICE study because they believed that this should be continued. The respondents perceived that the environment really impacts how the care providers valued doing such research. With a good environment, where staff are very happy with their workplace, they are likely to discuss the content of the report. Team leaders were thought important to foster self-development and team building and to develop relationships with other branches of health care.

We also explored the influence of a care provider’s workload and its effect on the uptake of the feedback reports as well as the influence of RAI-HC data and related feedback reports on care providers’ decisions about resource allocation and care planning. The data were collected in three different HC offices. Data consisted of semi-structured interviews, observations, and case manager personal journaling. From the data, three key types of factors affecting workload emerged: structural, procedural and individual. We held focus groups for verification as a final stage of data collection. Findings determined relationships between factors, for example the RAI standardized assessment tool as a structural factor affecting both processes and individual care planning. The influence of RAI-HC data and related feedback reports on a care provider’s decision-making was further investigated. Findings show that the case managers structure decision-making procedurally. The complex and contextual nature of resource allocation decision making was emphasized. Information such as that contained in feedback reports form part of the knowledge base on which case managers make decisions about care, but its direct effect on how it influences care planning and to what degree was not determined in this research.

**Study 3: Assessing context in Continuing Care in Alberta**

**Approach**

We assessed organizational context in each of the three streams using the Alberta Context Tool (ACT), a survey developed by Estabrooks and colleagues (Estabrooks, Squires, Cummings, Birdsell, & Norton, 2009; Estabrooks, Squires, Cummings, Teare, & Norton, 2009). It is based on the PARiHS (Promoting Action on Research Implementation in Health Services) developed at the Royal College of Nursing in the United Kingdom (Kitson, Harvey, & McCormack, 1998). The ACT addresses three elements of context: leadership, culture, and evaluation. Each dimension is measured by six (6) items on 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). The overall score for each dimension is derived by taking the average of the 6 items. Final scores range from 1 to 5, with higher scores implying better perception of context. For interpretability and for the purpose of description, we associate a “positive” perception if a context score is more than 3.5 and a “negative” perception if the score is otherwise. There are other scales in the context measurement collected at the same time as the ACT including the Maslach Burnout Inventory General Survey (MBI-GS short form) and the Problem Solving Inventory. The MBI GS includes subscales on professional efficacy, cynicism and
exhaustion. Each subscale is defined by three items. Each item is scored on a 7-point frequency rating scale that ranges from 0 (“never”) to 6 (“daily”). We obtained the overall score by taking the mean of the three items. The possible final score can range from 0 to 6. A complete description of this study is cited elsewhere (Fraser, Sales, O’Rourke, & Schalm, 2012; Sales AE, 2010). We administered the ACT pre- and post- the audit and feedback intervention in all sites. It is a self-administered survey which took approximately 20 minutes to complete. Survey versions were tailored to the various provider groups and managers.

The assessment of context was conducted in the four participating LTC facilities in Edmonton Alberta in year one, one month before and one month after the end of the 13 month intervention period. Data collection was conducted through a partner study (Translating Research in Elder Care, PI Estabrooks (Estabrooks, Squires, Cummings, Teare et al., 2009)) in two LTC facilities, and through our own study in the remaining two LTC sites. In both HC and SL, data collection of the two waves of the context tool was conducted by our DICE research team. Similarly, we administered the ACT HC and SL in two (2) waves – the first one a month prior to our feedback intervention and the second one month after the final intervention period.

We present separate descriptive summaries on basic demographic and work-related characteristics, and context dimension scores in each of the three continuing care streams in two waves of the survey.

**Long Term Care Results**

We received a total of 167 and 152 completed surveys from LTC participants in Waves 1 and 2, respectively. As shown in Appendix K, respondents were mostly HCAs (67%) in both waves; at least 94% were females and about 80% were between 30 and 59 years old.

Also in Waves 1 and 2, care providers had been in their role for about 9 years, on average. They had worked in the unit or nursing home for an average of 5 years. In a two-week period, they typically worked for an average of 60 hours.

The care provider scores on leadership, culture and evaluation were about the same in both waves with leadership and culture being more positive than evaluation.

**Home Care Results**

We received 120 completed survey questionnaires from HC staff in Wave 1, with nearly half of our participants being nurses (48%). The rest were composed of an almost equal number of allied professionals (25%) and HCAs (27%). In wave 2, we were able to collect 69 completed forms. The majority of the respondents were again nurses (64%) and there were more HCAs (25%) than allied health professionals (12%) this time (see Appendix L).

In both waves, our respondents were predominantly females and the majority belonged to the 50-59 age bracket. The care providers had been working in their current roles for about 10 to 11 years, on average. They had been employed in the site for an average of 8 years. Typically, they had worked for about 60 hours in a 2-week period.

The respondents’ average scores on leadership, culture and evaluation remained almost unchanged in waves 1 and 2. They had a positive response on the leadership and culture in their work environment as reflected in their high context scores. However, their opinion on the evaluation context was the opposite as indicated in their low scores. The reason for these lower scores has not been explored so far but it can be further explored through secondary analysis.
Supportive Living Results:

There were 101 health care staff who participated and filled out the questionnaire. Health care aides comprised more than 50% of the respondents while the allied health professionals were the fewest (15%). In wave 2 there were 82 questionnaires completed by care providers. Health care aides still dominated the sample (63%) and allied workers remained the fewest in number. Details are provided in Appendix M.

In both waves almost all were females and more than 50% were between the ages of 40 and 59 years old. On average, care staff had been functioning in their current roles for about 8 to 9 years.

They had been on the job in the site for about 4 to 5 years. In a typical 2-week period, they worked for about 65 hours.

Except for leadership, the respondents’ mean scores on culture and evaluation were about the same in waves 1 and 2. Their leadership score in wave 2 improved slightly compared to wave 1. Both their mean ratings on leadership and culture were high suggesting a positive impression of these contexts in their work settings. On the other hand, their mean evaluation scores were not as high as those on leadership and culture.

Final Remarks and Further Research

While this work adds to the growing body of knowledge on audit and feedback interventions in continuing care, it also sheds light on areas requiring further study. This work was carried out as part of a research program. The intent that capacity would be generated at the participating sites was a goal of the program. Site-level, or at least organizational-level, capacity building is necessary for sustainability of quality improvement interventions such as audit and feedback.

Early on it became apparent that, without additional targeted resources for data management, report generation and a champion to lead the intervention at each site, it would be difficult if not nearly impossible to sustain the intervention over time. During the time of this intervention study, system and organizational change was significant. Not only did the sites endure changes, but in the middle of our 5 year study, our provincial health system went through a major restructuring. Seven health regions became one and after the first year five Zones were created. Decision-makers changed and there was confusion and uncertainty. This undoubtedly had an impact on our study.

Applied research is needed to identify organizational and system barriers and supports that could lead to quality improvement interventions that are sustainable within current high velocity health systems. Additionally, further research is required with a focus on how factors impacting workload interact. This would allow for a better understanding and support quality improvement interventions such as audit and feedback to continue in spite of heavy workloads. When quality improvement activities can become part of everyday work, there may be greater success in sustaining them. Research into the development of more effective planning and development tools may mediate some of the challenges in sustaining quality improvement activities that may contribute to quality of care. Further studies should investigate how information on quality indicators can be fed back into health care providers’ (e.g. site leaders, nurse managers, and case managers) care planning and decision-making processes.
### ADDITIONAL SOURCES

**Manuscripts published/In Press:**


**Manuscripts in preparation:**


7. Fraser, K.D. Spenceley, S., Baylon, M.A., Cornish, A.. “Educational preparation and backgrounds of Health Care Aides in Continuing Care in Alberta: Findings from a demographic analysis”.


Presentations

Oral presentations:


11 Fraser, K.D. (Presenter), Spenceley, S., Baylon, M.A., Schalm, C., Sales, A. Determinants of professional efficacy among health care providers in continuing care. IQ2012: Inspiring Quality in Continuing Care, November 7 – 8, 2012, Calgary, Alberta.

12 Sales, A., Fraser, K.D., O’Rourke, H. (Presenter), Baylon, M.A. The impact of audit and feedback as a quality improvement strategy in long-term care: Preliminary findings. Canadian InterRAI, Vancouver BC. May 8-10, 2012.


15 Fraser, K.D. Feedback reports for quality improvement in long term care: A panel discussion. Inspiring Quality Conference. Alberta Continuing Care Association/Alberta Health Services. Edmonton, AB. October 4-5, 2011.


17 Fraser, K.D., O’Rourke, H.M. (presenter). The use of audit with feedback as a quality improvement strategy in long term care. InterRAI. The 2010 Canadian interRAI Conference. Toronto, ON. October 4-5, 2010.


Poster presentations:


REFERENCES


