

# **Minnesota Nursing Home Health Information Technology Survey Results**

Submitted to:  
Minnesota Department of Health  
Minnesota e-Health Initiative



Submitted by:  
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Stratis Health is a non-profit organization founded in 1971 that leads collaboration and innovation in health care quality and safety, and serves as a trusted expert in facilitating improvement for people and communities. [www.stratishealth.org](http://www.stratishealth.org)

The Minnesota e-Health Initiative is a public-private collaborative whose vision is to accelerate the adoption and use of health information technology in order to improve health care quality, increase patient safety, reduce health care costs and improve public health.  
[www.health.state.mn.us/e-health](http://www.health.state.mn.us/e-health)

## **Executive Summary**

In 2007, the Minnesota Legislature mandated that all Minnesota health care providers must have an interoperable electronic health records system in place within their clinical practice setting by January 1, 2015. To make progress toward meeting the legislative mandate, the Minnesota e-Health Initiative and the Minnesota Department of Health (MDH) set one of the e-health priorities for 2008 to assess the status of various care delivery settings in terms of electronic health record adoption, including assessing barriers and identifying solutions by delivery setting.

MDH contracted with Stratis Health to determine the level of health information technology (HIT) use in Minnesota nursing homes. Stratis Health developed, implemented, and analyzed a health information technology survey of Minnesota nursing homes. The survey was sent to nursing home administrators at Medicare-certified Minnesota nursing homes, as identified by Care Providers of Minnesota and the Minnesota Health and Housing Alliance.

This report focuses on key findings of the survey and provides information about the prevalence of HIT use in Minnesota nursing homes. The survey tool was designed to collect information about the implementation and use of HIT software/technology to support care delivery in nursing homes. In addition to the level of use of electronic health records (EHR), the results describe the use of software/technology including: resident assessment and care planning, census management, medication administration record, documentation of clinical notes, decision support tools, receiving external clinical documents, and e-prescribing between practitioner and pharmacy.

HIT terminology and definitions are not commonly understood, which can make it difficult for health care providers, including nursing homes, to articulate the level of technology/software they currently use.

The survey established a baseline measurement, with nearly 32 percent of nursing homes indicating that they have an EHR. The facilities use varying levels and combinations of technology to support clinical and administrative functions.

The survey results show that 32 percent of nursing homes reported that they have fully or partially implemented an EHR (Figure 1). Twenty-two percent of nursing homes reported that they have not implemented an EHR and/or have no plans for implementation. Thirty-eight percent of respondents are in the planning or information-gathering stage, while seven percent are in the vendor development or selection stage, participating in demonstrations, or in a request-for-proposal process.

Nursing homes affiliated with some sort of group—either a hospital, integrated system, or a regional chain, or located in an urban area—are more likely to have an EHR implemented than those who are not part of a group. Nursing homes that are not part of a group, such as free-standing nursing homes in rural communities, are less likely to have an EHR fully or partially implemented.

Despite the prevalence of a range of health information technologies, nursing homes still have much progress to make to meet the Minnesota legislative mandate that all Minnesota health care providers are required to have in place an interoperable electronic health records system by 2015.

Lack of capital resources is the greatest barrier to adoption and implementation of HIT. Instability in the nursing home market and the significant capital costs of HIT contribute to this barrier.

## Background

In 2007, the Minnesota Legislature mandated that all Minnesota health care providers must have an interoperable electronic health records system in place within their clinical practice setting by January 1, 2015.<sup>1</sup> An electronic health record is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting (HiMSS, 2006). In a 2005 report, MDH estimated that few systems have clinical EHR, and those that do have little interoperability and interconnectivity.<sup>2</sup>

To make progress toward meeting the legislative mandate, the Minnesota e-Health Initiative and MDH set one of the e-health priorities for 2008 to assess the status of various care delivery settings in terms of electronic health record adoption, including assessing barriers and identifying solutions by delivery setting.<sup>3</sup> As part of its e-Health Initiative, MDH contracted with Stratis Health to determine the level of health information technology (HIT) use in Minnesota nursing homes, and establish a baseline for HIT activity in nursing homes in the state.

Stratis Health holds the Medicare Quality Improvement Organization contract for Minnesota and has been assisting adult primary care clinics with the adoption and implementation of EHR since November 2005. First in 2005, then in 2007, Stratis Health surveyed 603 adult primary care clinics to assess the status and progress of EHR implementation. In addition to work with clinics and HIT, Stratis Health has been building relationships with Minnesota nursing homes since 1999 and is considered to be a neutral resource available to nursing homes working to improve their processes and quality of care.

The number of nursing home facilities in Minnesota is declining. In 2005, Minnesota had 402 facilities. In 2007, the state had 380. According to the Medicare Website “Nursing Home Compare”<sup>4</sup> (November 2007), the homes are distributed fairly evenly between rural and urban areas. Less than 18 percent of all Minnesota nursing homes have fewer than 50 beds and half of the facilities in the state have 50 to 99 beds. (See Table 1).

Nursing homes can use HIT to assist with administration, operations, and electronic health records. This survey focuses on components that would primarily fall within an electronic health record.

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<sup>1</sup> 2015 Electronic Health Record Mandate, Minnesota Statutes, section 62J.495, [https://www.revisor.leg.state.mn.us/bin/getpub.php?pubtype=STAT\\_CHAP\\_SEC&year=current&section=62J.495&image.x=12&image.y=9](https://www.revisor.leg.state.mn.us/bin/getpub.php?pubtype=STAT_CHAP_SEC&year=current&section=62J.495&image.x=12&image.y=9).

<sup>2</sup> Minnesota e-Health: Roadmap and Preliminary Recommendations for Strategic Action.

<sup>3</sup> *MN e-health Initiative Report to the Legislature*, February 2008, <http://www.health.state.mn.us/e-health/leg rpt2008.pdf>.

<sup>4</sup> Nursing Home Compare, November 2007, <http://www.medicare.gov/NHCompare/Home.asp?version=alternate&browser=IE%7C6%7CWinXP&language=English&defaultstatus=0&pagelist=Home&CookiesEnabledStatus=True>.

## Methods

Stratis Health began this project by identifying and scanning existing survey tools. Not finding an appropriate ready-to-use survey, Stratis Health developed an original survey in collaboration with MDH, the Minnesota e-Health Initiative, and Jennie Harvell, Senior Policy Analyst, U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Survey questions were written to collect information pertaining to the implementation and use of HIT software/technology in nursing homes. The survey consisted of 53 items, 33 of which were related to HIT use, four specifically addressing EHRs and a final question to measure obstacles preventing or slowing implementation.

Because the terms HIT and EHR are often used interchangeably, the survey was designed to collect information in ways that would differentiate between the two. Specific questions were included about functions supported by software/technology and its level of use. This was followed by specific questions regarding EHR and EHR implementation status.

Stratis Health obtained nursing home demographic information from Nursing Home Compare, Medicare's website that provides detailed information on all Medicare and Medicaid certified nursing homes. In addition, two questions were included in the survey to assess demographic characteristics of nursing homes. One asked nursing homes to describe their profit status (for-profit or not-for-profit). The other asked nursing homes to describe their structure (part of a national chain, regional chain, a hospital or integrated care system, or free-standing).

Stratis Health solicited feedback on the survey questions from a variety of individuals and organizations with expertise ranging from the long-term care industry to HIT. The survey was tested with several nursing home administrators to help ensure clarity and understanding. Finally, it was converted to a Web-based format.

Using lists from Care Providers of Minnesota and the Minnesota Health and Housing Alliance, Stratis Health compiled a survey recipient list of the administrators of all 380 Medicare-certified skilled nursing facilities in Minnesota, and sent them an e-mail with a link to the online survey. Stratis Health followed up with numerous e-mail and telephone reminders to non-responders. This approach resulted in a 78.2 percent response rate; of the 380 nursing homes that received the survey, 297 completed it.

## Results

The high response rate yielded a representative sample of Minnesota nursing homes, reflecting the state's mix of profit status, number of beds, location, and type of nursing home (Table 1). Although the proportion of non-profit respondents is slightly higher than the proportion in the state as a whole, the difference is not statistically significant. The majority of nursing home respondents (62.6%) described their profit status as not-for-profit. For-profit facilities made up a quarter of respondents, with government facilities making up 11.5 percent. A small minority of the facilities, about 14 percent, are hospital-based.

**Table 1: Demographic Characteristics of Survey Respondents and of All Minnesota Nursing Homes**

Characteristics	Survey Respondents % (n)	All Minnesota Nursing Homes % (n)
<b>Profit Status</b>		
For-profit	25.9% (77)	26.9% (102)
Not-for-profit	62.6% (186)	60.4% (229)
Government	11.5% (34)	12.7% (48)
<b>Number of Beds</b>		
0-49	16.5% (49)	17.6% (67)
50-99	50.2% (149)	50.5% (192)
100-149	22.2% (66)	21.6% (82)
150 or more	11.1% (33)	12.9% (49)
<b>Location</b>		
Rural	51.2% (152)	53.2% (202)
Urban	48.8% (145)	46.8% (178)
<b>Type of Nursing Home</b>		
Hospital-based	14.1% (42)	13.9% (53)
Part of a multi-nursing home chain	52.2% (155)	50.40% (191)
Free-standing	30.6% (91)	Not Available

Demographic data is from Nursing Home Compare, November 2007.

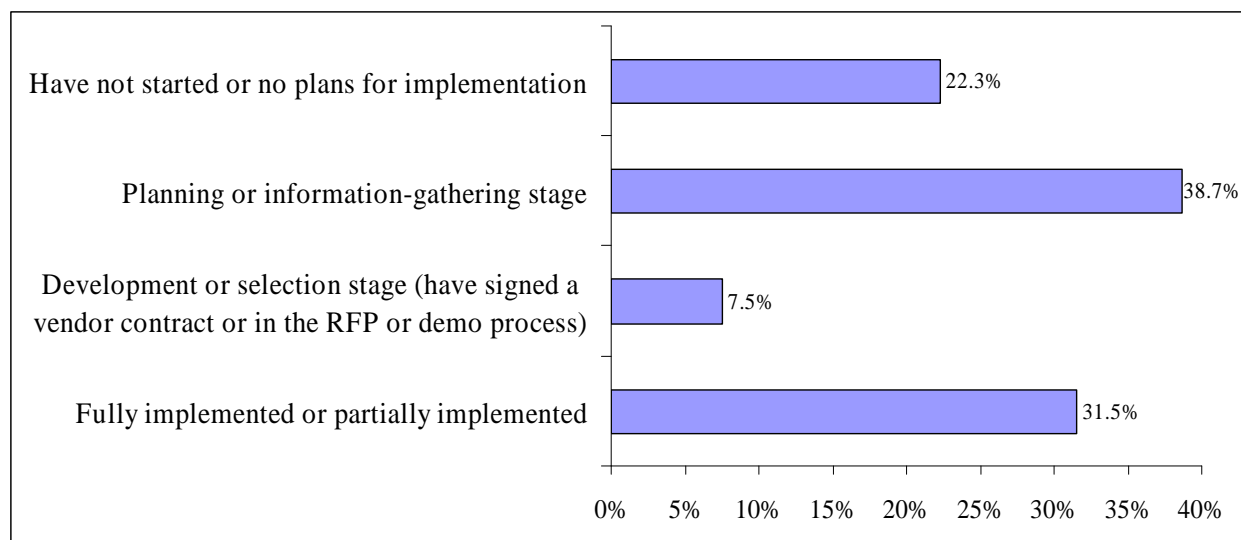
\*Rural versus urban designation was assigned using the CMS Metropolitan Statistical Area (MSA) definition for rural/urban.

### ***EHR Implementation***

The survey results show that 32 percent of nursing homes reported that they have fully or partially implemented an EHR (Figure 1). Twenty-two percent of nursing homes reported that they have not implemented an EHR and/or have no plans for implementation. Thirty-eight percent of respondents are in the planning or information-gathering stage, while seven percent are in the vendor development or selection stage, participating in demonstrations, or in a request-for-proposal process. So more than three-fourths of respondents are either using an EHR or are in

the planning or selection phase. Of those who have no plans to implement an EHR, 41 percent were for-profit compared to 15 percent who were not-for-profit.

**Figure 1: EHR Implementation Status of Minnesota Nursing Homes**



Respondents reported using 11 different vendors for EHR and general technology/software, with five of the vendors implemented at more than two-thirds (81.5%) of the nursing homes.

EHR implementation status by demographic characteristics is outlined in Table 2. Responses showed little difference in the rate of EHR implementation between for-profit (27.0%) and not-for-profit (33.0%) nursing homes.

Nursing homes with a greater number of beds were more likely to have an EHR fully or partially implemented than nursing homes with fewer beds. Of those with 100 or more beds, 40 percent reported implementation. Of those with fewer than 100 beds, 27.4 percent reported implementation.

EHR implementation rates also varied by the type of nursing home. Those that are part of a hospital or integrated care system were more likely to have an EHR fully or partially implemented—46.7 percent compared to 28.2 percent for non-system based nursing homes. Nursing homes that are part of a chain had slightly higher implementation rates (31.6%) than non-chain nursing homes, although the difference was not statistically significant. However, when examining national and regional chains separately, nursing homes that are part of a national chain were less likely to have an EHR fully or partially implemented (19.5%) than nursing homes that are part of a regional chain (43.6%).

Although no significant difference was found between free-standing nursing homes and other nursing homes overall, rural free-standing nursing homes had lower rates of implementation (21.7%) than urban free-standing nursing homes (24.1%). These results indicate that nursing homes affiliated with some sort of group—either a hospital, integrated system, or a regional chain, or located in an urban area—are more likely to have an EHR implemented than those who are not



part of a group. Nursing homes that are not part of a group, such as free-standing nursing homes in rural communities, are less likely to have an EHR fully or partially implemented.

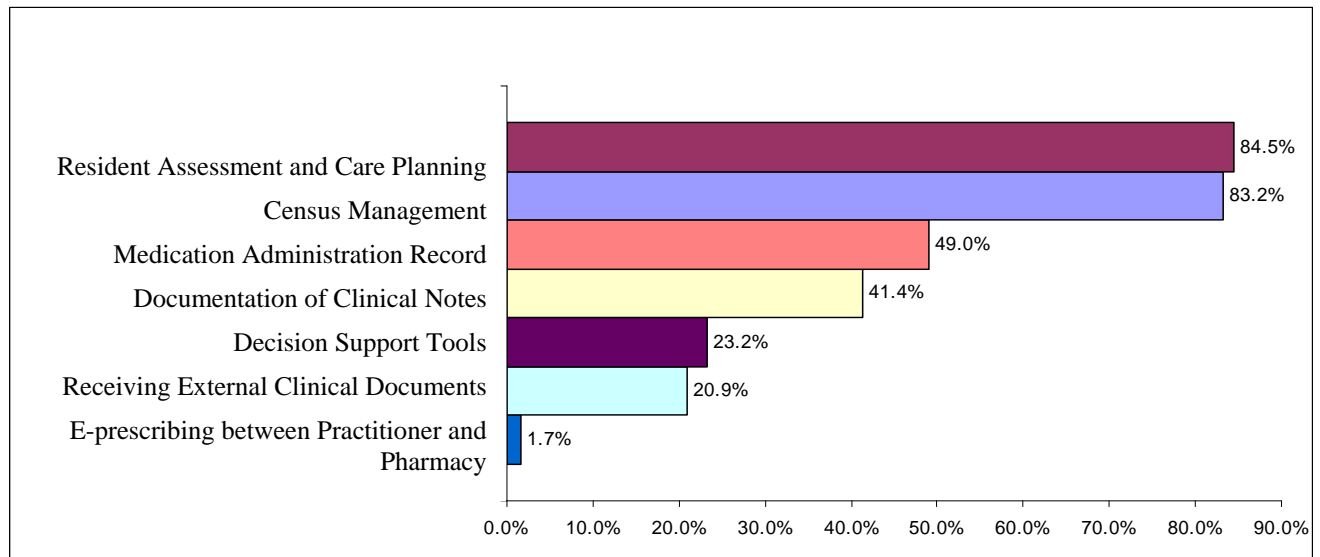
**Table 2: EHR Implementation Status by Demographic Characteristics**

<b>Nursing Home Characteristics</b>	<b>EHR Fully or Partially Implemented % (n)</b>
<b>Profit Status</b>	
For-profit	27.0% (20/74)
Not-for-profit	33.0% (72/218)
<b>Number of Beds</b>	
0-99	27.4% (54/197)
100 or more	40.0% (38/95)
<b>Location*</b>	
Rural	30.7% (46/150)
Urban	32.4% (46/142)
<b>Type of Nursing Home</b>	
Chain ownership	31.6% (49/155)
National	19.5% (15/77)
Regional	43.6% (34/78)
Free-standing	22.5% (20/89)
Hospital-based or integrated system	46.7% (21/45)

### **Other Software/Technology Implementation**

To further understand the use of software and technology in nursing homes, the survey asked about the level of use of seven technology-supported clinical and administrative functions in nursing homes (Figure 2). The results show significant variation in use of these functions across nursing homes. A large number of respondents indicated that they use software/technology for resident assessment and care planning (84.5%) and census management (83.2%), while very few nursing homes use technology for e-prescribing between practitioner and pharmacies (1.7%).

**Figure 2: Clinical/Administrative Functions Supported by Software/Technology**



Because HIT terminology is not standardized, Stratis Health included definitions of the seven clinical and administrative functions in the survey. The definitions are as follows; corresponding rates of use are in Figure 2 and embedded in the paragraphs below.

- **Resident assessment and care planning** is electronic data collection and availability of data for creation of the plan of care and goal setting. It may be limited to an overall plan of care, or may allow for discipline-specific plans of care (e.g., therapy plans of care and nursing plans of care). Respondents reporting use: 84.5 percent
- **Census management** is defined as patient demographics. It can be a stand-alone software that provides real-time information on resident transfers, discharges, admissions, pre-admissions, payor changes and staff scheduling. Respondents reporting use: 83.2 percent
- **Medication administration record (MAR)** is the record where all medications administered to patients are recorded and where the medication list is generated from. A MAR may allow providers to view recent lab results and patient allergies. It interfaces with the pharmacy system, computerized order entry system, and patient tracking (admission-discharge-transfer) system. Respondents reporting use: 49.0 percent
- **Documentation of clinical notes** creates addends, corrects, authenticates, and closes clinical visit data (including assessments/clinical measurements, interventions, communications, etc.). Respondents reporting use: 41.4 percent

- **Decision support tools** provide best practice suggestions for care plans and interventions based on clinical problems/diagnoses. They may include alerts or reminders for specific interventions (e.g., disease management programs), automated prompts for preventive practices (e.g., immunizations), and decision support for e-prescribing. They may also include information on dosing, drug selection, drug-to-drug interactions, and drug-to-food interactions. Respondents reporting use: 23.2 percent
- **Receiving external clinical documents** from external facilities/agencies electronically, including provider notes, laboratory data, radiology data, medical devices, patient history, patient consults, pharmacy/consultant pharmacist reports, etc. This may capture importing paper documents by scanning to include with other EHR data. It may also include the ability to view existing documents that were captured by other systems. Respondents reporting use: 20.9 percent
- **E-prescribing between practitioner and pharmacies** is electronic transmission of prescription information between health care providers and pharmacies. Respondents reporting use: 1.7 percent

Survey results show that use of technology-supported clinical and administrative functions varies depending on the type of nursing home. More rural nursing homes use MAR software (55.9%) than do urban nursing homes (41.7%). A greater percent of urban nursing homes (25.5%) than rural nursing homes (16.5%) use technology to receive clinical documentation. The same is true for documentation of clinical notes (44.8% urban and 38.2% rural).

Not-for-profit nursing homes reported a higher use of MAR software/technology (53.4%) than for-profit nursing homes (36%). Systems or hospitals were more likely to use technology that receives clinical documentation (50.0%) and document clinical notes (52.2%). Finally, nursing homes that are part of a chain were more likely to have census management (91.1%), resident assessment and care planning (90.5%), and MAR (59.0%) functions implemented than other types of facilities.

The majority of nursing homes (63.0%) reported that they use software/technology to support two to four of the seven clinical/administrative functions included in the survey. Only one nursing home reported using software/technology to support all seven functions. Of the 18 that are using six or more functions, three (16.7%) are using two or more software vendors to support the various functions, and 12 use the same vendor to support all of their functions.

A number of nursing homes reported using two or more software applications to support a single function. Having redundant software can result in duplication of effort and reduced efficiency.

Nursing homes that are part of an integrated system/hospital were more likely to have software to receive clinical documentation and to document clinical notes than other types. This may be due to the relatively high level of technology penetration within the hospital setting, and the value in being able to electronically access information across the integrated care system.

Nursing homes that are part of a regional chain or hospital system were more likely to have implemented a greater number of functions while nursing homes with fewer functions implemented were more likely to be free-standing. A significant number of nursing homes (57.0%) that are part of a regional chain use the same three functions, indicating a similar product may have been distributed to all of these nursing homes.

Over half (50.4%) of nursing homes indicate that documentation of clinical notes occurs at the nurse's station. However, another 36.6 percent indicate that documentation of clinical notes occurs at kiosks located outside the resident's room. Very few nursing homes are using other technology, such as laptops, PDA's or computers at the bedside, to document clinical notes.

## **Barriers**

Survey respondents rated a list of 14 barriers that may have slowed or prevented them from implementing and/or using software/technology in their facilities.

The top four major barriers were:

- Lack of capital resources to invest (72.1%)
- Insufficient time to select, contract, install, and implement software/technology (26.5%)
- Inability to easily input historic medical record data into the software/technology system (25.4%)
- Lack of technical infrastructure (e.g. networking, servers, other hardware) (24%)

By far the most frequently reported barrier was the lack of capital resources to invest in software/technology, with 72 percent noting it as a major barrier.

## **Discussion**

The survey is one of the first assessments on the status of EHR and supporting HIT use in nursing homes in Minnesota. This study has established a baseline, and offers a cross-sectional view at a point in time on the state of HIT adoption in Minnesota nursing homes. It provides a preview of their technology adoption status, the needs and the barriers. Given the rapid rate of change in the HIT industry and the evolving nursing home market in Minnesota, future surveys will be needed in order to maintain an understanding of the state of HIT in nursing homes.

### **Observations and Future Survey Issues**

As the current HIT terminology and definitions are not universally accepted, it can be difficult for health care providers, including nursing homes, to articulate the level of technology/software adoption currently in use. Future surveys should adopt/adapt national definitions on terminology related to EHR and use them to guide data collection.

Although a nursing home may have the opportunity to use an EHR adopted by the hospital, that product may not meet the specific complex and diverse needs of the nursing home setting and may therefore go partially or fully unused. If the integrated system can identify and work with a vendor with complementary product lines, resources may be used more efficiently.

Questions remain about the number of vendors serving nursing homes and their understanding of and willingness to develop products tailored to the specific needs of nursing homes. Due to lack of certification for products offered in this setting, it was difficult to get an estimate of complex issues such as interoperability. As EHR certification expands to the long term care sector and functional needs of systems are better articulated, these issues should be incorporated in future surveys.

Future surveys should ask about HIT-related staff competencies and training needs. Survey data could be used to support and address issues related to workforce capacity and competencies. Workforce capacity assessment related to HIT needs to be done across all healthcare settings.

Further studies should be considered to gain a better understanding of nursing homes and HIT adoption. Results of this survey could be compared to other data sources. For example, these measurements could be compared with data from MDH Nursing Home Survey results to determine if there is a correlation between the use of technology and scope and severity of deficiencies.

## **Recommendations and Next Steps**

### **Develop Strong Business Case to Support EHR / HIT Investments**

Information and education on the benefits of adopting and implementing EHRs in nursing homes would help nursing home decision makers establish a business case for investing in an EHR and empower them to move toward implementation. In addition, technical assistance and support specifically tailored for nursing homes would be beneficial. These survey data provide a current state assessment of EHR / HIT utilization in nursing home sector and point to the need to make progress.

### **Plan to Understand and Address Barriers**

This survey points to four leading barriers in the adoption of EHR / HIT in nursing home settings. Of those, the top two were lack of capital resources and insufficient technical expertise and people resources to facilitate technology selection and implementation. The significant capital costs of HIT are a burden for nursing homes, particularly those operating close to their financial margins. Identifying possible funding opportunities for Minnesota nursing homes would help reduce or eliminate their most commonly cited barrier—lack of capital resources to invest. State and private organizations should work with long term care associations to address these barriers.

### **Support Collaborations to Create Common Specifications for Long Term Care**

Development of EHR requirements in a collaborative fashion for the nursing home community should be supported. The survey points to limited vendors and products in this market space and this could be an incentive to draw vendors. It is unclear how prepared HIT vendors are to meet the needs of long term care clients, including nursing homes. This question should be explored.

**Conduct On-going Assessments**

The changing landscape of both the state of HIT adoption and the nursing home market underscores the need to conduct on-going assessments. The nursing home marketplace in Minnesota is going through a period of instability, with the number of nursing homes declining by five percent (22 facilities) between 2005 and 2007. This instability and lack of certainty about the future impacts facility decision making about HIT adoption. Understanding the trend in adoption and utilization status requires data collected over time making future studies/surveys essential.

The interoperability of electronic health records adds value in the long term care setting, as patients move frequently among providers and between settings (nursing home, clinic, home health, hospital etc). Nursing homes are only one component of the long term health care continuum; additional studies should be conducted to assess the level of HIT adoption in other parts of the continuum, including home health and assisted living.