Carbapenem-Resistant Enterobacteriaceae in North Carolina Healthcare Facilities:

Survey of Hospital Infection Preventionists, Microbiology Laboratories, and Licensed Nursing Homes (January 1–December 31, 2013)

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CRE Survey Overview

Background

Carbapenem-resistant Enterobacteriaceae (CRE) are a growing public health concern. These organisms are associated with high mortality rates and have the potential to spread widely. In the United States, the most common mechanism of carbapenem resistance is production of the *Klebsiella pneumoniae* carbapenemase (KPC). Although KPC-producing strains of CRE have been identified in North Carolina, carbapenem resistance can also result from production of less common metallo-β-lactamase enzymes such as New Delhi metallo-β-lactamase (NDM), Verona integrin-encoded metallo-β-lactamase (VIM), and imipenemase metallo-β-lactamase (IMP).

As an initial assessment of CRE prevalence in our state, the North Carolina Division of Public Health (N.C. DPH) and the North Carolina Statewide Program for Infection Control and Epidemiology (N.C. SPICE) distributed a survey to hospital infection preventionists (IPs) and hospital laboratories in 2012. Respondents to the 2012 surveys were asked to report CRE-related information for the 18-month period of January 1, 2011–June 30, 2012.

In 2014, a second survey to IPs and hospital laboratories, and a new survey for licensed nursing homes (LNHs) was distributed. Respondents were asked to report CRE-related information for the period of January 1, 2013–December 31, 2013.

These 2012 and 2014 surveys were specifically developed to determine 1) the prevalence of CRE colonization and infection in North Carolina; 2) current laboratory practices for detecting CRE; and 3) practices used to prevent transmission. The 2014 results also provide baseline information regarding prevalence of and response to CRE in nursing homes. In collaboration with partners, N.C. DPH will use these data to inform current and future surveillance and prevention strategies.

Survey Methods

Survey Design: N.C. DPH developed all surveys using SurveyMonkey™. Respondents were asked to provide information for the period January 1, 2013–December 31, 2013. N.C. DPH and N.C. SPICE distributed the surveys through email listservs to the following groups: IPs in all acute care and long-term acute care facilities; hospital-based microbiology laboratories; and administrators for licensed nursing homes. Questions for IP and lab surveys were similar to questions in the 2012 survey. However, new questions were added regarding antibiotic stewardship and laboratory identification methods. Surveys were approved by the N.C. Healthcare-Associated Infection Advisory Group.

Analysis: Eighty-seven acute care hospitals were eligible for inclusion in the survey (Appendix A). Non-acute care hospitals and hospital laboratories that did not test for or confirm CRE were excluded. Laboratories that provided microbiology diagnostic services to either acute care hospitals or nursing homes in North Carolina were eligible for inclusion. Four hundred and ten nursing homes licensed by the N.C. Division of Health Service Regulation were eligible for inclusion in the nursing home survey (Appendix B). Responses lacking requested information regarding frequency of CRE identification were excluded from analysis. Data were analyzed on the state level and on the regional level using six geographic regions defined by the North Carolina Hospital Association (NCHA, Appendices A and B).

Definitions: Based on the N.C. Consensus Guidelines for CRE Screening and Confirmatory Testing published in March, 2014 (http://epi.publichealth.nc.gov/cd/cre/cre_guidance.pdf), CRE were defined as Enterobacteriaceae that are either non-susceptible (intermediate or resistant) to one of the carbapenems tested and resistant to one or more third-generation cephalosporins; OR positive for carbapenemase production by a phenotypic test (e.g., the modified Hodge test (MHT); OR positive for a carbapenemase gene sequence by molecular methods. This differs from the initial survey conducted in 2012, in which CRE were defined as Enterobacteriaceae that were nonsusceptible to one of the carbapenems and resistant to all third-generation cephalosporins tested.

NOTE: Comparisons are made in this report between the surveys initial distributed in 2012 and those distributed in 2014 for questions that were asked during both surveys. Please note that the 2012 surveys solicited information for an 18-month period, while the 2014 surveys solicited information for a 12-month period.

Summary

Responses were received from IPs at 50/87 (57%) eligible hospitals, from 36 microbiology laboratories serving 49/87 eligible hospitals, and from 146/410 (36%) nursing homes. CRE were identified in all regions within North Carolina during January 1–December 31, 2013. At least one patient with CRE infection or colonization was identified during this period by 36 of 50 (72%) hospitals, 26 of 41 (63%) laboratories, and 22 of 146 (15%) nursing homes. CRE were identified 2–10 times per year in the majority of acute care hospitals responding. Given these findings, all regions in North Carolina were classified as "regions with few CRE identified" during 2013 based on criteria established by CDC and outlined in the 2012 CRE Toolkit.

Discussion

Survey results suggest that CRE continue to be a public health threat in North Carolina hospitals and nursing homes. Overall, the prevalence of CRE colonization and infection reported during 2013 was similar to the prevalence reported during 2011–2012.

In 2014, the NC Division of Public Health collaborated with partners to develop and publish Consensus Guidelines for CRE Screening and Confirmatory Testing. Responses from the 2014 survey indicate that additional laboratories have implemented or will implement the methods in these guidelines.

CRE are generally recognized as epidemiologically important multi-drug resistant organisms by IPs, microbiology laboratory managers, and nursing home facility administrators. IP and laboratory survey responses indicate that an increasing proportion of hospitals are engaging in efforts to identify CRE infection or colonization, such as screening of contacts to known cases; conducting point prevalence surveys; and performing reviews of microbiology records to identify CRE cases. As a result of these actions, facilities were able to identify previously undetected CRE cases. Just over half of responding nursing homes indicated they have or would screen residents epidemiologically-linked to CRE cases, although very few nursing homes performed (or would perform) point prevalence surveys and conducted active surveillance during 2013. Conversely, more than 80% of LNHs reported that they had implemented (or would implement) the majority of measures recommended for control of CRE.

CRE infection or colonization is not currently a reportable condition in North Carolina and is not on the list of nationally notifiable conditions. However, efforts to increase detection and prevention of CRE infections are ongoing. NC DPH is currently working with partners to conduct surveillance for CRE in NC hospitals that participate in the Hospital-Based Public Health Epidemiologist Network (http://epi.publichealth.nc.gov/phpr/phe.html). This sentinel surveillance system will help inform the future of CRE monitoring and response in North Carolina.

I. Infection Preventionist (IP) Survey Results

Infection Preventionists were asked to provide information on the frequency of CRE identification as well as overall awareness and response to CRE during January-December 2013.

2014 IP Survey Summary (comparisons are made to 2012 survey when data are available):

- Response rates were lower in 2014 than in 2012 (57% vs. 78%)
- Thirty-six hospital IPs (72%) reported at least one patient infected or colonized with CRE during the survey period (compared to 53% in 2012)
- CRE identification was evenly distributed among the 6 NCHA regions
- More than 85% of responders believed CRE to be epidemiologically important.

A. CRE Prevalence and Frequency of Identification

1. ***Statewide summary and response rate.*** Fifty of 87 eligible licensed acute care hospitals in North Carolina completed surveys in 2014 (response rate of 57%, compared to 78% response rate in 2012). Thirty-six hospitals reported having at least one CRE-infected or -colonized patient present in their facilities, representing 72% of all responding hospitals and 41% of all eligible hospitals (Table 1.1). In 2012, the same number of hospitals (36) reported CRE, representing 53% of responding hospitals and 41% of all eligible hospitals.

Table 1.1 Number of hospitals reporting CRE during January 1, 2013–December 31, 2013

CRE Report Status	No. Eligible Facilities	No. Facilities Responding	CRE Status among Responding Facilities
CRE Identified	36 (41%)	50 (57%)	36 (72%)
No CRE identified	14 (16%)		14 (28%)
No Response (CRE Unknown)	37 (43%)	37 (43%)	--
Total	*87*	*87*	*50*

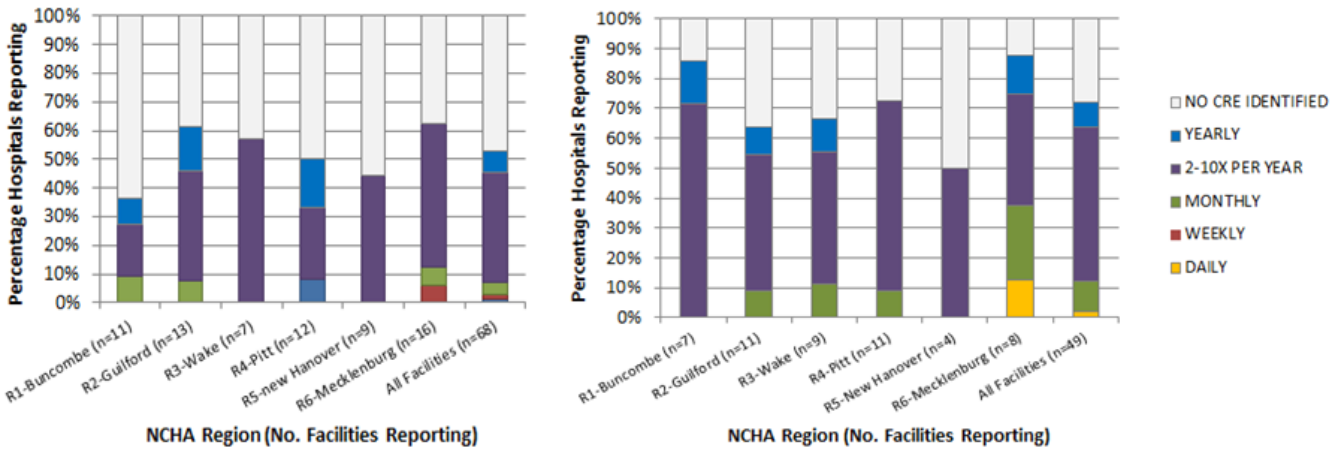
2. ***Regional summary.*** CRE were reported by facilities in all six regions of the state. The number of acute care hospitals and number reporting CRE are provided in Table 1.2 below.

Table 1.2 Number of hospitals reporting CRE during January 1, 2013–December 31, 2013 by region

NCHA Region	No. Facilities	No. Facilities Responding	Hospital Response (Survey Completed)	
			CRE Identified at Facility	No CRE Identified at Facility
1 (Buncombe)	14	7 (50%)	6 (86%)	1 (14%)
2 (Guilford)	15	11 (73%)	7 (64%)	4 (36%)
3 (Wake)	12	9 (75%)	6 (67%)	3 (33%)
4 (Pitt)	15	11 (73%)	8 (73%)	3 (27%)
5 (New Hanover)	13	4 (31%)	2 (50%)	2 (50%)
6 (Mecklenburg)	18	8 (44%)	7 (88%)	1 (12%)
North Carolina	*87*	*50 (57%)*	*36 (72%)*	*14 (28%)*

3. ***Reported frequency of CRE identification, by NCHA Region.*** Overall, a larger proportion of hospitals in each region indicated that CRE were detected in 2013 compared to 2011-2012, despite the data period being shorter (Figure 1.1). CRE were most often identified two to 10 times per year in both survey periods.

Figure 1.1 Frequency of CRE identification among North Carolina hospitals by region – 2011-2012 survey: 2013 survey:



4. ***Hospital and transfer/community-onset CRE.*** For the purposes of this survey, IPs were asked to report whether CRE infections or colonizations were hospital-onset (specimen collected >48 hours after admission) or transfer/community-onset (specimen collected ≤48 hours after admission). There were no apparent differences in the distribution of transfer/community onset or hospital onset between the two survey periods; 40% or fewer were hospital-onset during both periods.

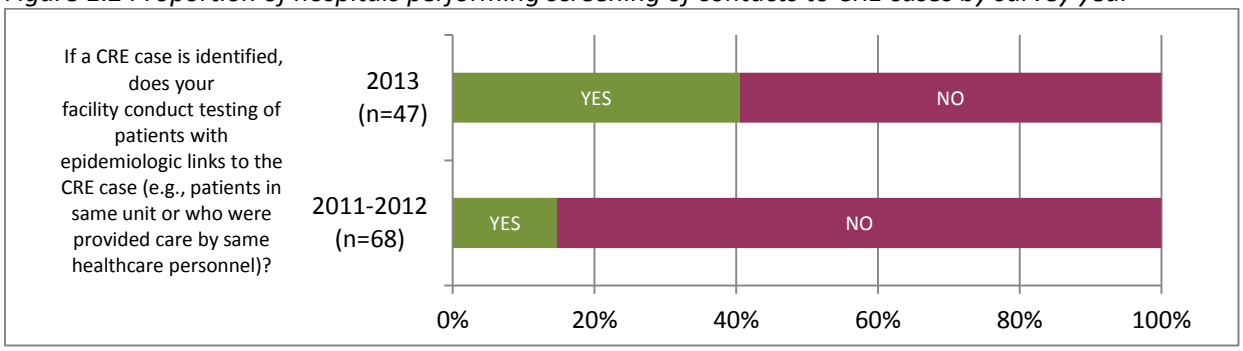
B. Surveillance and Screening

Infection preventionists were asked to report implementation of CDC recommendations for detection of CRE-infected or -colonized patients (described in the 2012 CRE Toolkit).

1. ***CRE screening of epidemiologically linked patients.*** Persons with CRE may serve as a reservoir for transmission. Screening of patient contacts can be conducted to identify transmission within the facility and is a primary prevention strategy.

   Approximately 40% of facilities (19/47 responders) reported they would conduct screening of patient contacts to a CRE case, which is more than twice the proportion who reported that they would screen contacts in the 2011–2012 survey.

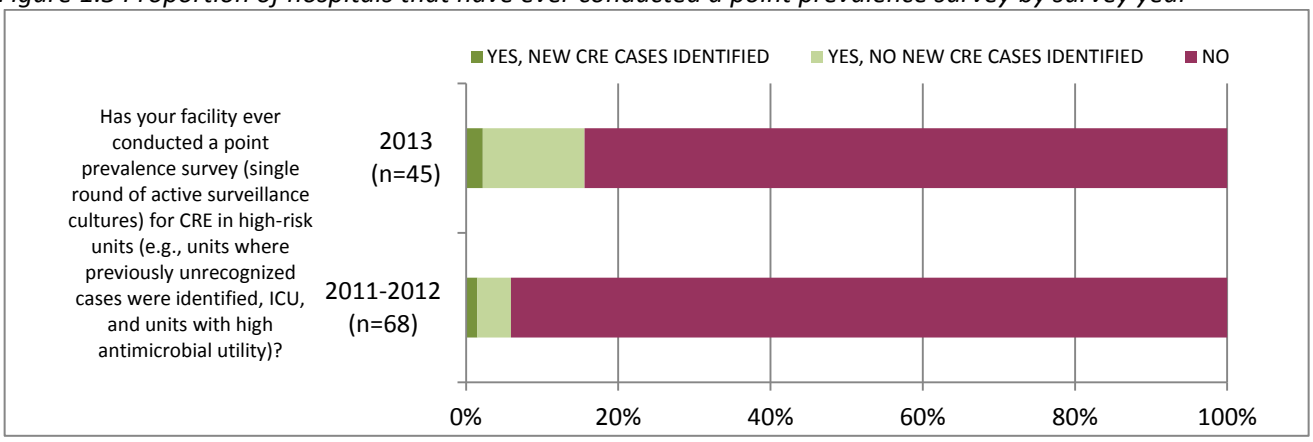
Figure 1.2 Proportion of hospitals performing screening of contacts to CRE cases by survey year



2. ***Point prevalence survey.*** Point prevalence surveys can be used to rapidly evaluate the prevalence of CRE in a population or unit.

   Point prevalence surveys were conducted more frequently in 2013 compared to 2011-2012. Seven (16%) hospitals indicated that a point prevalence survey was conducted in 2013. Of those, 1 reported identifying a previously undetected CRE case as a result.

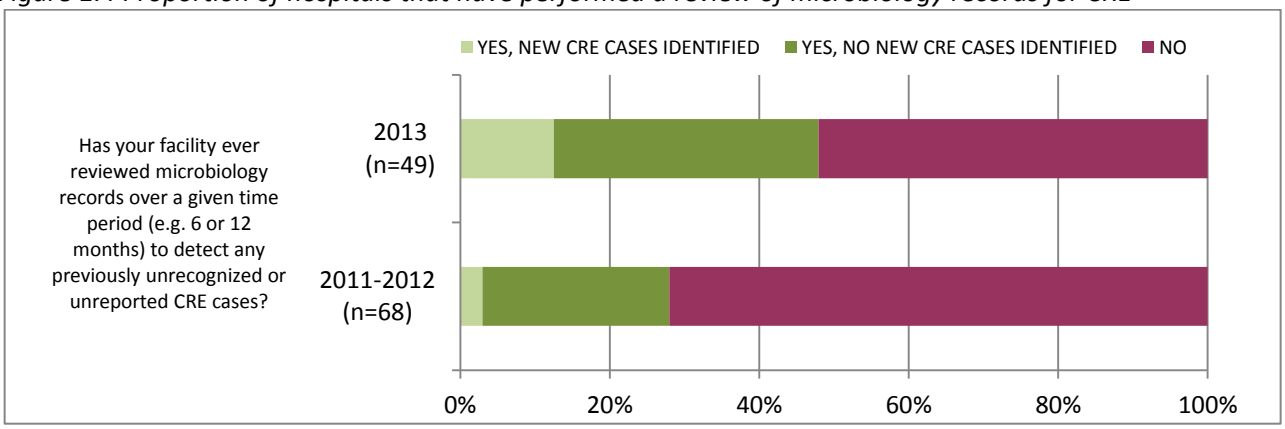
Figure 1.3 Proportion of hospitals that have ever conducted a point prevalence survey by survey year



3. ***Review microbiology records.*** The review of microbiology records may also be an effective method to detect previously unrecognized or unreported CRE cases.

   Twenty-three facilities (47% of responders) reported that they had performed a review of microbiology records, in 2013, compared to 19 (28%) in 2011-2012. Of those 23 hospitals, six (12%) identified previously undetected cases in 2013, compared to 3% in 2011-2012.

Figure 1.4 Proportion of hospitals that have performed a review of microbiology records for CRE

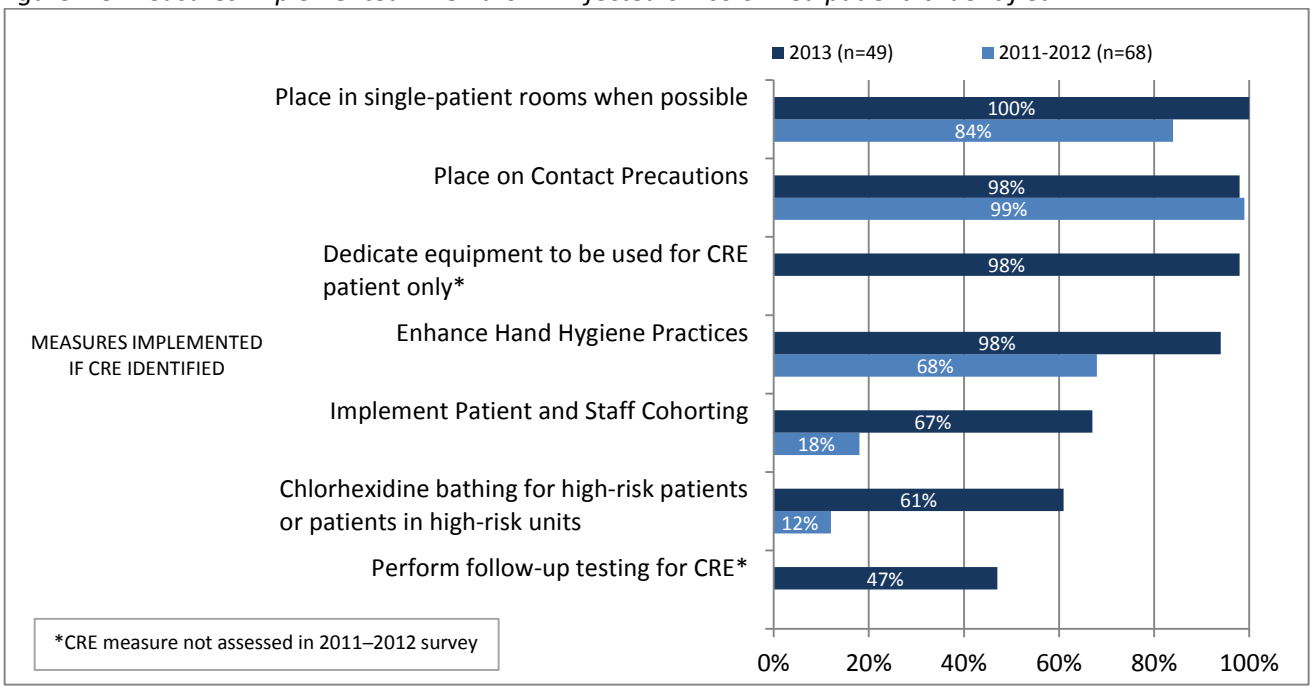


C. Infection Control & Prevention in Hospitals

The CDC recommends eight strategies to prevent CRE transmission in the healthcare setting. These strategies are outlined in the 2012 CRE Toolkit and include: 1) hand hygiene, 2) contact precautions, 3) healthcare personnel education, 4) minimizing use of invasive devices, 5) patient and staff cohorting, 6) laboratory notification, 7) promoting antimicrobial stewardship and 8) CRE screening. One objective of this survey was to understand how frequently each of these practices was implemented.

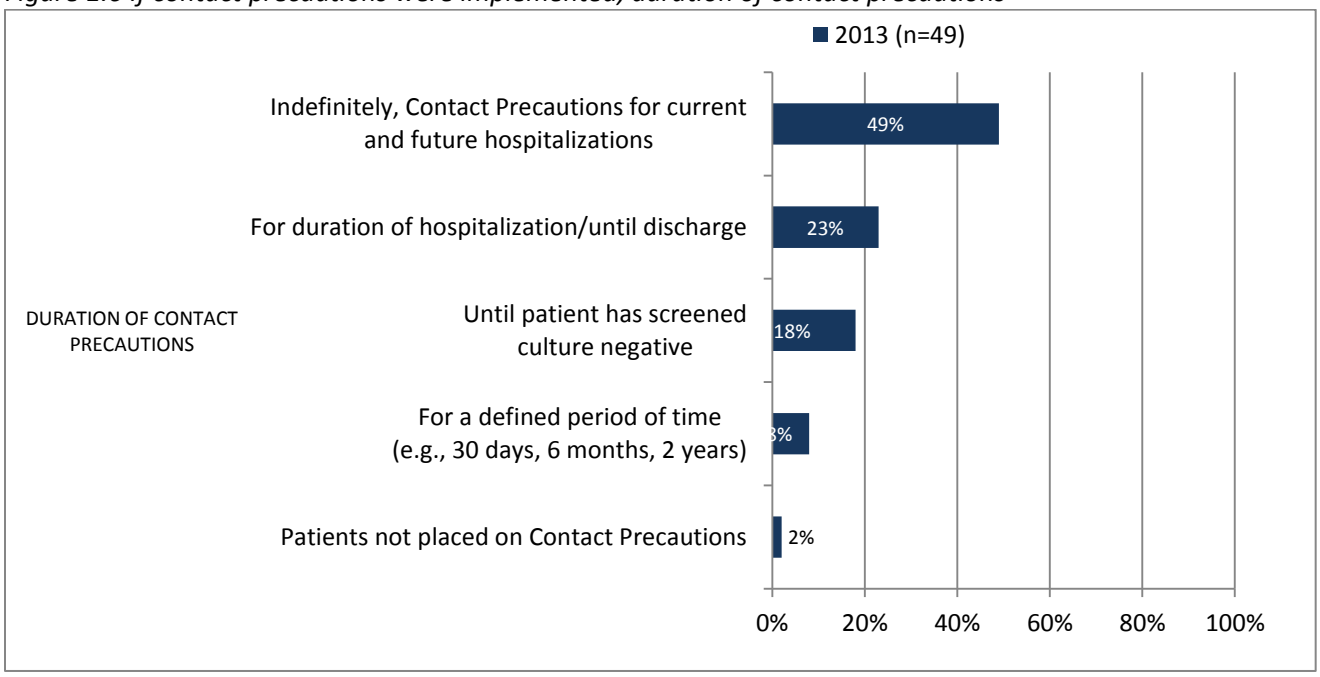
1. ***Measures implemented.*** Responses regarding implementation of prevention strategies were similar for the 2011-12 and 2013 survey periods. However, one difference identified during the 2013 survey period was that more facilities indicated they did or would implement patient/staff cohorting (67%) and chlorhexidine bathing (61%).

Figure 1.5 Measures implemented when a CRE- infected or -colonized patient is identified



The 2013 survey also asked responders to specify the duration of Contact Precautions. Approximately half of responding facilities indicated that patients would remain on Contact Precautions indefinitely- i.e. for current and future hospitalizations.

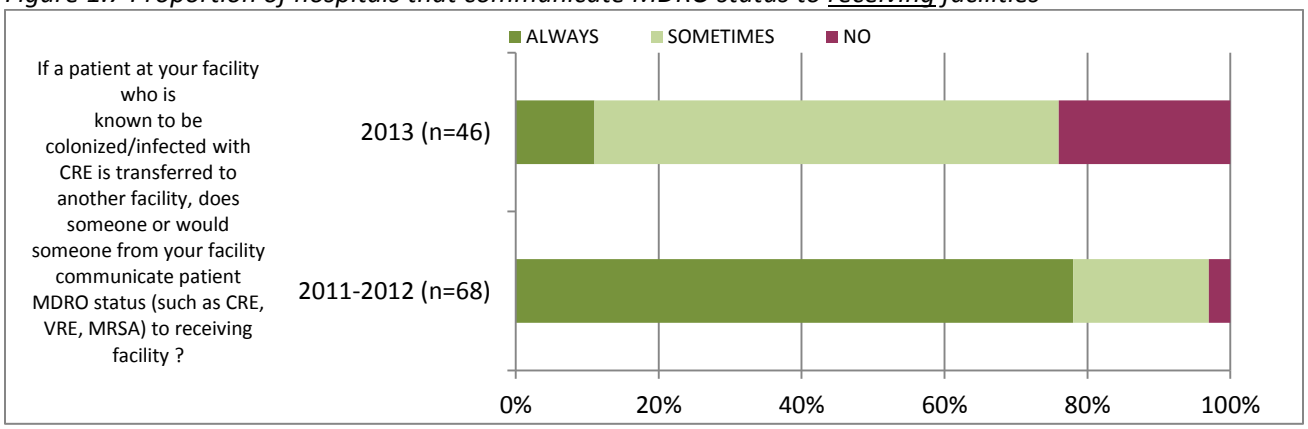
Figure 1.6 If contact precautions were implemented, duration of contact precautions



2. ***Transferring OUT of hospital.*** Inter-facility sharing of patients has the potential to facilitate transmission of CRE and other multi-drug–resistant organisms (MDROs).

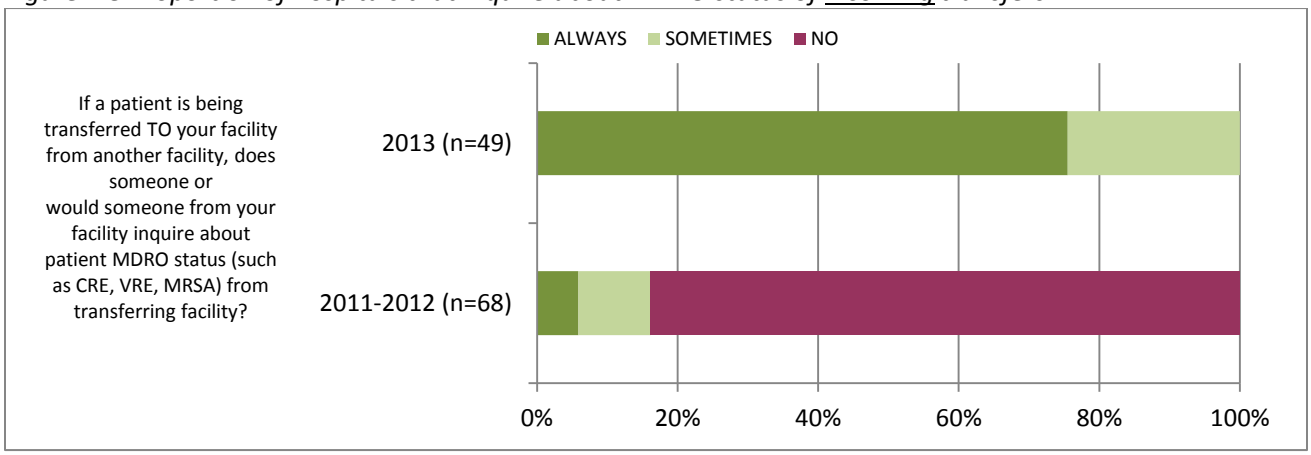
   Thirty-five facilities (76% of responders) in 2013 reported always or sometimes communicating MDRO/CRE status to receiving facilities, which was lower than during the earlier survey period (97%).

Figure 1.7 Proportion of hospitals that communicate MDRO status to receiving facilities



3. ***Transferring INTO hospital.*** All facilities responding for the 2013 survey period indicated that they sometimes or always inquired about the MDRO status of patients transferred from other facilities. In 2011–2012, only 11 responding facilities (16%) indicated that they regularly inquired about MDRO status of incoming patients.

Figure 1.8 Proportion of hospitals that inquire about MDRO status of incoming transfers



4. ***Long-term acute care transfer.*** Long-term acute care hospitals have been identified as having a higher prevalence of CRE infection or colonization as compared to acute care hospitals or nursing homes. Of the 48 responding hospitals, 45 (94%) indicated that they either received patients from or discharged patients to a long-term acute care facility in 2013.

D. Perception of CRE as an Important Multi-Drug Resistant Organism (MDRO)

Controlling transmission of CRE in healthcare facilities is dependent upon healthcare facilities recognizing that these organisms are epidemiologically important. Ninety percent of responders (44/49) indicated that their facilities consider CRE to be an epidemiologically important multi-drug resistant organism for which specific infection control practices are indicated to eliminate transmission (compared to 85% for the 2011–2012 survey period).

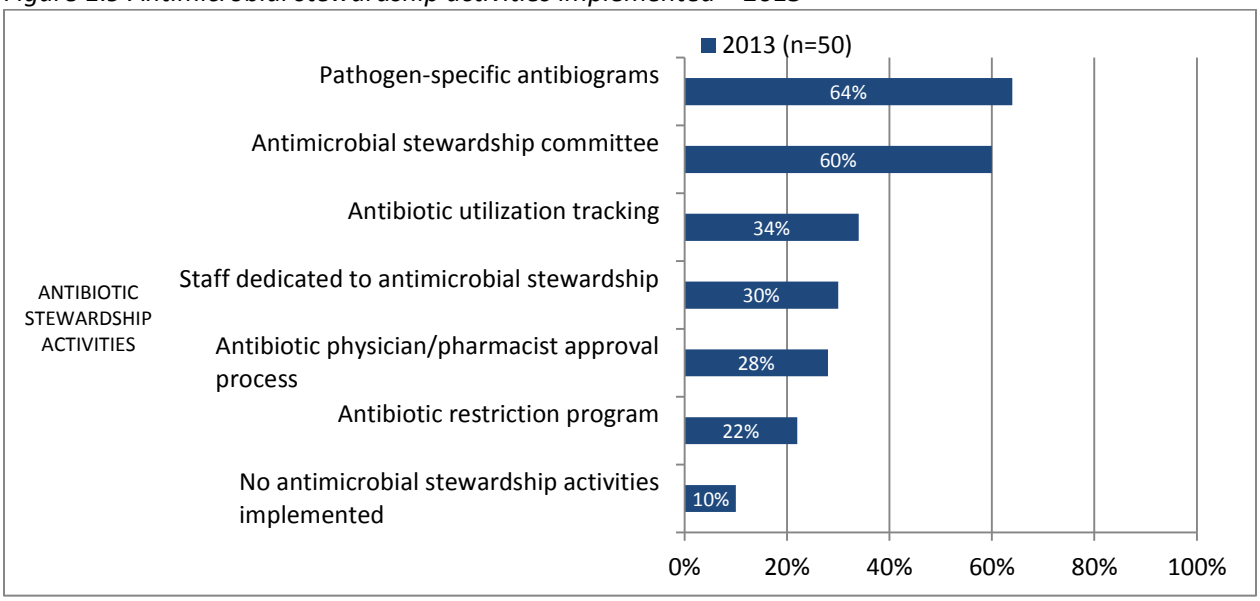
E. Antimicrobial Stewardship

The overuse and misuse of antimicrobial drugs can lead to an increase in colonization and infection with drug-resistant organisms, such as CRE. Since 2012, the N.C. DPH HAI Prevention Program and its partners have been collaborating to mitigate drug-resistance. This has included participation in the national Get Smart campaign to encourage appropriate use of antibiotics. The 2014 CRE survey included new questions to assess hospital antimicrobial stewardship practices and obtain baseline information on awareness of the problem and implementation of activities to improve antimicrobial prescribing practices.

Of the 50 respondents to the 2014 survey, 64% (n=32) indicated that their facilities had implemented pathogen-specific antibiograms (e.g., summaries indicating percentage of specific pathogens susceptible to various antimicrobials), and 64% (n=32) had also established antimicrobial stewardship committees.

Only 5 (10%) respondents reported that their facilities did not have any antimicrobial stewardship activities implemented in 2013. Lack of physician buy-in, pharmacy staffing shortages, and limited resources were the primary reasons cited by facilities that did not have stewardship activities in place.

Figure 1.9 Antimicrobial stewardship activities implemented – 2013



II. Laboratory Survey Results

Microbiology laboratories were asked to indicate the number of patients from whom CRE were isolated during January-December 2013. Laboratories were included in the analysis if they provided service to one of the eligible acute care hospitals or licensed nursing homes.

2013 Lab Survey Summary (comparisons are made to 2011-2012 survey when data are available):

- Thirty-six eligible laboratories completed the survey, representing 56% of acute care hospitals (compared to 46 eligible laboratories representing 66% of hospitals in 2011–2012).
- Seventy-two percent of responding laboratories reported identifying CRE at some point during 2013, compared to 80% in 2011–2012.
- Use of automated susceptibility testing to identify CRE was more frequently reported than in the previous survey (77% in 2013 versus 43% in 2011–2012).
- A higher proportion of laboratories reported use of lower breakpoints for carbapenems and cephalosporins in 2013 than during 2011–12, but more than 50% still used the higher breakpoints.
- Fewer labs reported having the ability to build a query for CRE in 2013 compared to 2011–2012 (70% versus 90%).

A. CRE Prevalence and Frequency of Identification

1. Statewide summary and response rate. Twenty-six (72%) of the 36 reporting laboratories identified CRE during the 12-month survey period (January - December 2013). This was similar to the proportion of laboratories identifying CRE during the 18-month period covered by the previous survey (80%). Overall, 56% of eligible acute care hospitals were represented by the laboratories responding to the 2013 survey, compared to 66% in 2011-2012.

Among the 49 hospitals covered by reporting laboratories, the median number of CRE-infected or -colonized patients identified over the 12-month survey period was three, with an interquartile range of 0–13. This was similar to the median number of CRE-infected or -colonized patients identified among the 57 hospitals covered by the 2012 survey during the 18-month survey period.

2. Regional summary. Per the laboratory survey, CRE were identified on at least one occasion in all regions of the state. More than 60% of respondents in each region identified CRE at least once during the survey period. Regional response rates and the proportion of reporting hospitals in which CRE were identified are presented in Table 2.1.

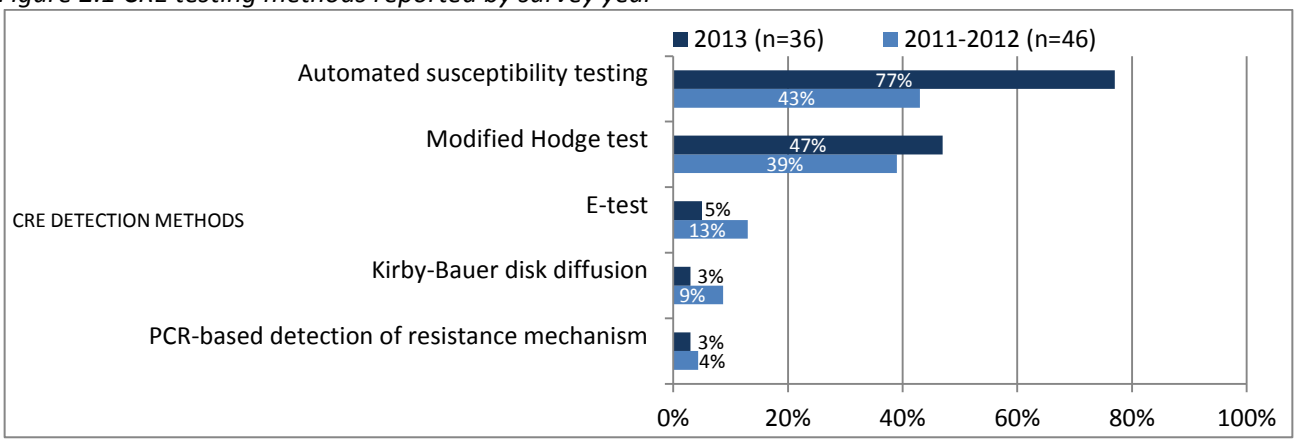
Table 2.1 Number of laboratories reporting CRE during January 1, 2013–December 31, 2013 by region

NCHA Region	No. Laboratories Completing Survey	No. Laboratories with CRE Identified	No. Hospitals Represented By Laboratories	No. Hospitals in Region	% Hospitals Covered by Laboratory Survey	No. Hospitals with CRE Identified
1 (Buncombe)	6	5 (83%)	7	14	50%	5 (71%)
2 (Guilford)	5	3 (60%)	6	15	40%	3 (50%)
3 (Wake)	3	2 (67%)	4	12	33%	2 (50%)
4 (Pitt)	10	7 (70%)	12	15	80%	9 (75%)
5 (New Hanover)	7	5 (71%)	8	13	62%	6 (75%)
6 (Mecklenburg)	5	4 (80%)	12	18	67%	6 (50%)
North Carolina	36	26 (72%)	49	87	56%	31 (63%)

B. CRE Detection Methods

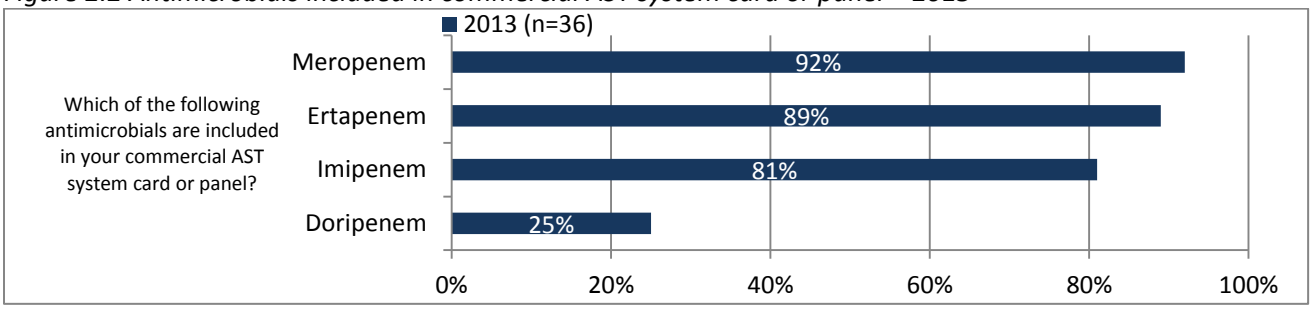
1. Testing methods. Laboratories were asked to report testing methods used to identify CRE in clinical specimens. Twenty-eight responders (77%) reported the use of automated susceptibility testing in 2013, a higher proportion than in 2011-2012 (46%). Among those laboratories using automated susceptibility testing, Microscan was used by 20 (59%) and Vitek by 14 (41%); a similar breakdown of automated testing was reported in 2011–2012.

Figure 2.1 CRE testing methods reported by survey year



2. Antimicrobials. Meropenem was the most common antimicrobial included in commercial AST systems, followed by ertapenem and imipenen.

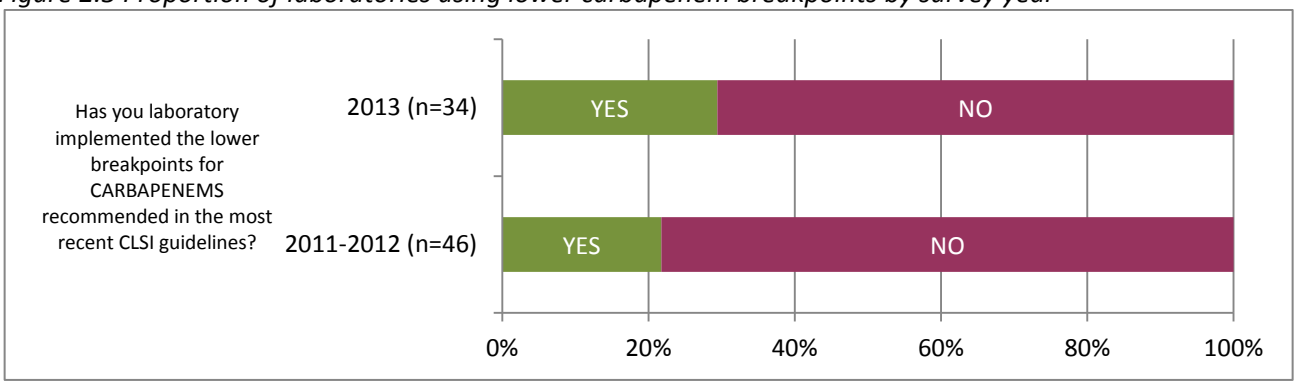
Figure 2.2 Antimicrobials included in commercial AST system card or panel – 2013



3. Breakpoints. In 2010 and 2012, the Clinical and Laboratory Standards Institute (CLSI) made changes to the interpretative criteria for determining susceptibility of Enterobacteriaceae to carbapenems. These new criteria lowered the minimum inhibitory concentration (MIC) breakpoints and removed the requirement for carbapenemase testing (e.g., modified Hodge test). Laboratories were asked if the lower CLSI-recommended breakpoints had been implemented and, if not, when they planned to implement them.

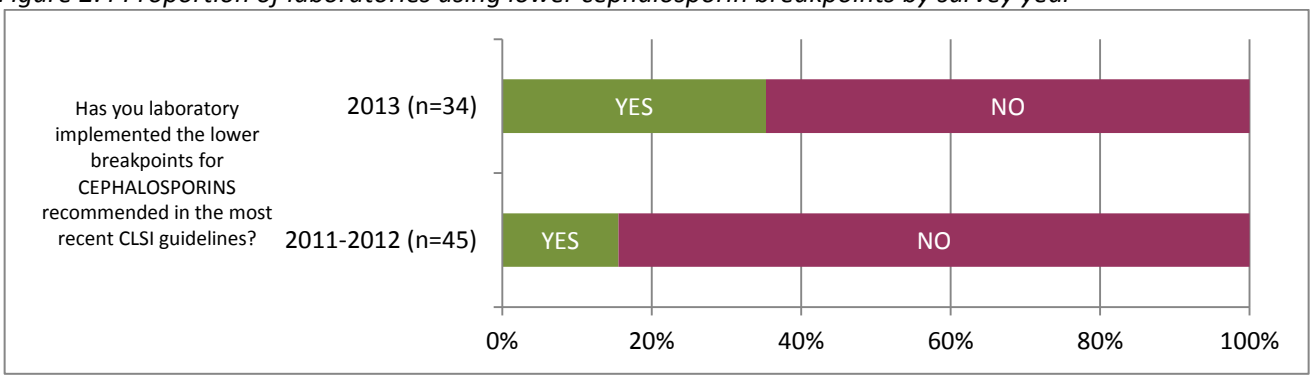
Carbapenem breakpoints. Ten responding laboratories (29%) reported using the lower breakpoints in 2013, a slightly higher proportion than in 2011-2012. Approximately 40% of responding laboratories that had not yet implemented the 2012 breakpoints reported that they planned to do so within the next year.

Figure 2.3 Proportion of laboratories using lower carbapenem breakpoints by survey year



Cephalosporin breakpoints. Twelve laboratories(35%) reported using lower breakpoints for cephalosporins in 2013, compared to 7 (16%) in 2011–2012. Six (27%) of the laboratories that had not yet implemented lower breakpoints reported that they planned to do so within the next year.

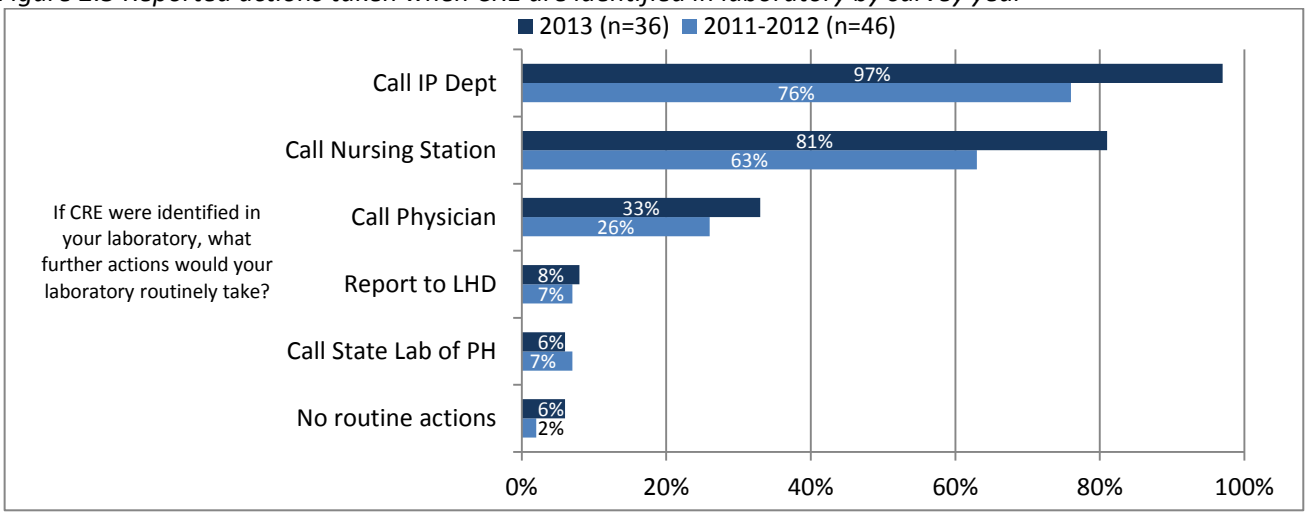
Figure 2.4 Proportion of laboratories using lower cephalosporin breakpoints by survey year



C. Other Laboratory Survey Results

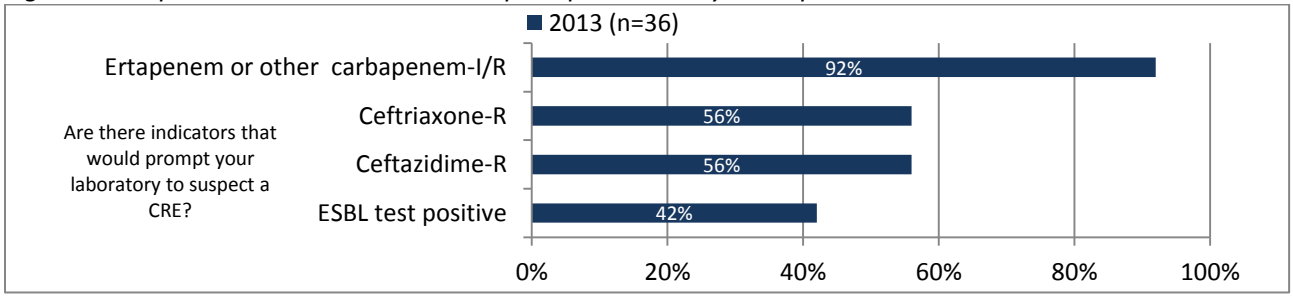
1. ***Actions***. Laboratories were asked to report what actions were taken when CRE were identified. Most laboratories reported that they would call the infection prevention department (97%) or call the nursing station (81%). Overall, a larger proportion of responding laboratories reported that they would notify partners in response to CRE in 2013 compared to responses from the 2011-2012 survey period.

Figure 2.5 Reported actions taken when CRE are identified in laboratory by survey year



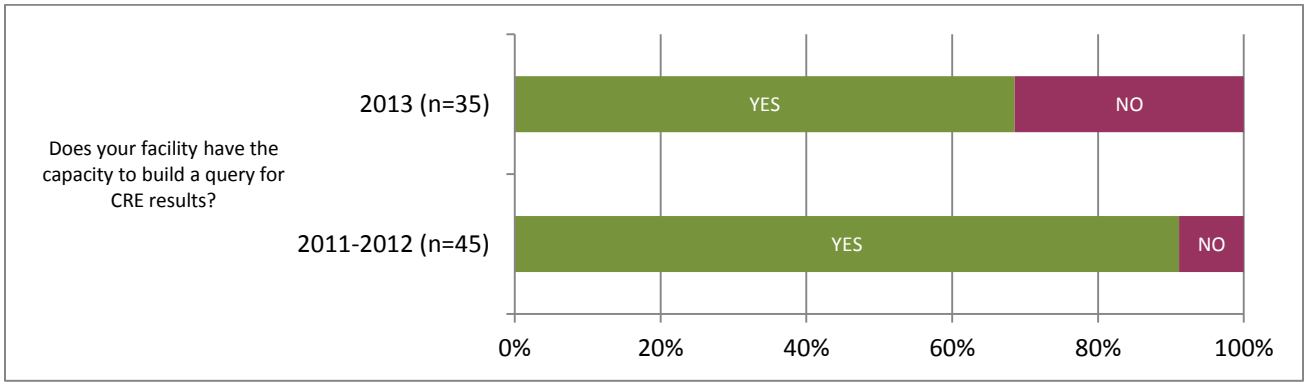
2. ***Indicators.*** In the 2013 survey, laboratories were asked to report if there were specific indicators that would prompt them to suspect CRE. Almost all responders (92%) indicated that ertapenem or other carbapenem intermediate (I) or resistant (R) susceptibility would lead them to suspect a CRE. Ceftriaxone or ceftazidime resistance were also identified as indicators by more than half of laboratories.

Figure 2.6 Reported indicators that would prompt laboratory to suspect CRE – 2013



3. ***CRE query capacity.*** Laboratories were asked if they had the capacity to build a query for CRE results. Twenty-four (69%) laboratories reported that they had the capacity in 2013, compared to 41 (90%) in 2011-2012.

Figure 2.7 Proportion of laboratories having the capacity to build a query for CRE by survey year



III. Licensed Nursing Home (LNH) Survey Results

Licensed nursing home (LNH) administrators and staff identified as having infection prevention responsibility were asked to provide information on the frequency of CRE identification as well as the overall awareness of and response to CRE during January-December 2013. This represents the first time N.C. DPH has distributed a CRE survey to these facilities.

2014 LNH Survey Summary:

- 146 facilities responded to the 2014 survey, representing 36% of all eligible LNHs in North Carolina.
- Twenty-two responding LNHs (15%) reported having at least one CRE-infected or -colonized resident during 2013.
- More than 60% of LNH respondents reported that their facilities considered CRE to be epidemiologically important.

A. CRE Prevalence and Frequency of Identification

1. Statewide survey and CRE response rate. Twenty-two (15%) of the 146 reporting LNHs identified CRE-infected or -colonized residents during 2013. Overall response rates and the proportion of reporting facilities in which CRE were identified are presented in Table 3.1.

Table 3.1 Number of LNHs reporting CRE during January 1, 2013–December 31, 2013

CRE Report Status	No. Facilities	No. Facilities Responding	CRE Status among Reporting Facilities
CRE Identified	22 (6%)	146 (36%)	22 (15%)
No CRE identified	124 (30%)		124 (85%)
No response	264 (64%)	264 (64%)	--
Total	*410*	*410*	*146*

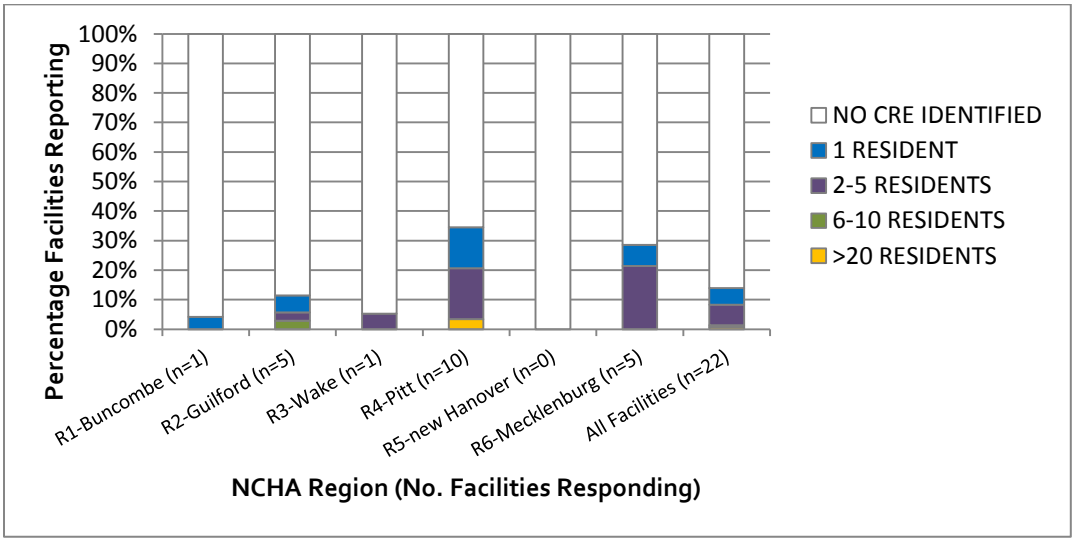
2. Regional summary. CRE were reported by LNHs in five of the six regions of the state. The number of LNHs and number reporting CRE are provided in Table 3.2 below. CRE were identified by more than 30% of responding facilities in Region 2 (Guilford), Region 4 (Pitt), and Region 6 (Mecklenburg).

Table 3.2 Number of nursing homes reporting CRE during January 1, 2013–December 31, 2013 by region

NCHA Region	No. Facilities	No. Facilities Responding	Hospital Response (Survey Completed)	
			CRE Identified at Facility	No CRE Identified at Facility
1 (Buncombe)	74	24 (32%)	1 (4%)	23 (96%)
2 (Guilford)	80	36(45%)	5 (44%)	31 (56%)
3 (Wake)	53	19 (36%)	1 (5%)	18 (95%)
4 (Pitt)	63	29 (46%)	10 (34%)	19 (66%)
5 (New Hanover)	59	23 (56%)	0 (0%)	23 (100%)
6 (Mecklenburg)	77	15 (19%)	5 (33%)	10 (67%)
North Carolina	*410*	*146 (36%)*	*22 (15%)*	*124 (85%)*

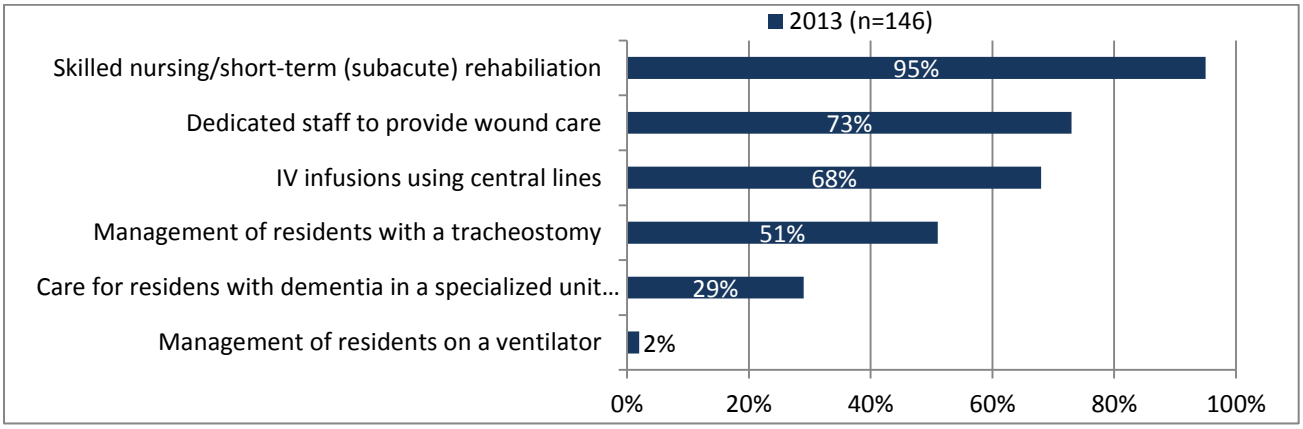
***3. Reported frequency of CRE identification and transmission*.** Regional variation in frequency of CRE identification among LNHs is illustrated in Figure 3.1 below. Among facilities identifying CRE-infected or –colonized residents, none reported evidence of transmission between residents.

Figure 3.1 Frequency of CRE identification among North Carolina LNHs by region – 2013



***4. Licensed nursing home characteristics*.** Respondents to the LNH survey were asked to identify the specific resident services delivered at their facilities. Responding LNHs reported an average daily census of 98. Only Two % reported providing services for ventilator-dependent residents.

Figure 3.2 Resident services delivered among LNHs – 2013

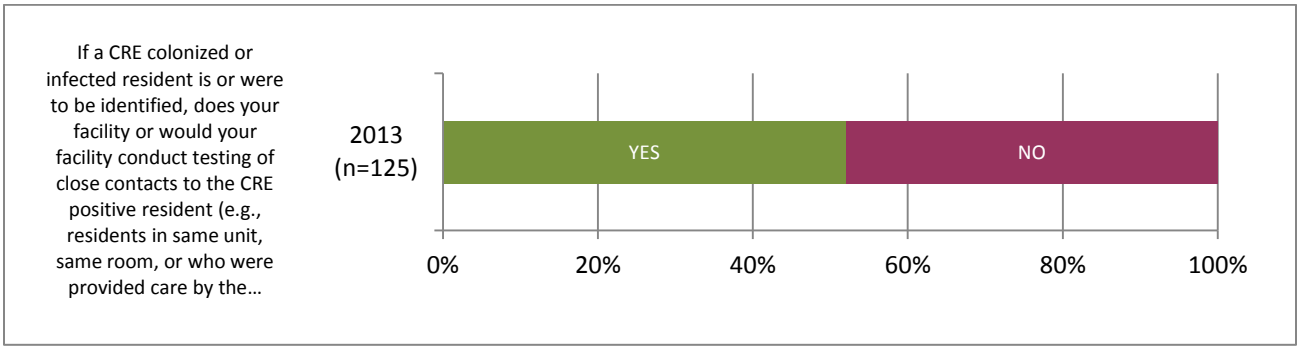


B. Surveillance and Screening

Licensed nursing home administrators and infection prevention staff were asked to report implementation of CDC recommendations for detection of CRE-infected or -colonized patients (as described in the 2012 CRE Toolkit).

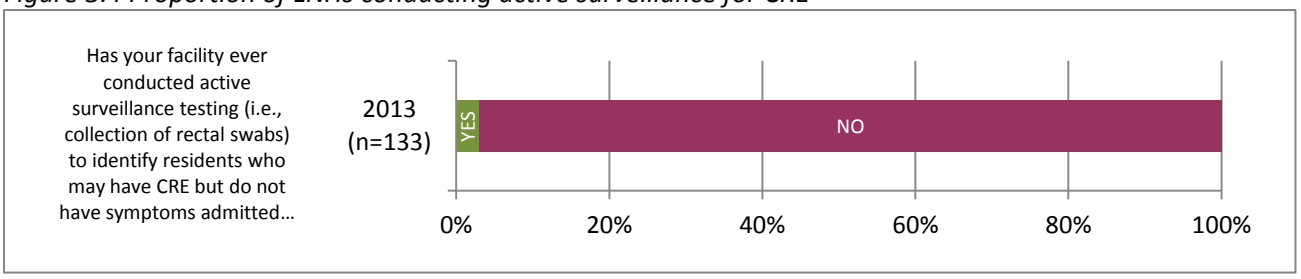
1. CRE screening of epidemiologically linked patients. Fifty-two percent of facilities (65/125) reported that they would screen contacts to an identified CRE case.

Figure 3.3 Proportion of LNHs performing screening of contacts to CRE cases



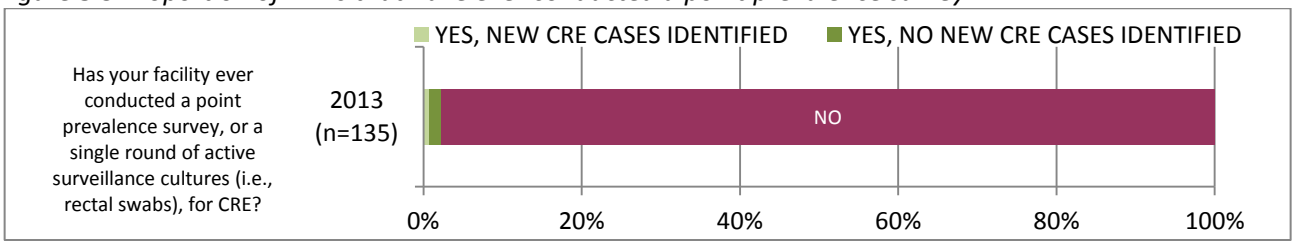
2. Active surveillance. Active surveillance may be considered for facilities with CRE transmission. Surveillance would include screening patients who meet specified criteria, including high-risk patients or those patients admitted from high-risk settings. Approximately 3% of LNHs (4/133) reported conducting active surveillance testing for CRE in 2013.

Figure 3.4 Proportion of LNHs conducting active surveillance for CRE



3. Point prevalence survey. Point prevalence surveys can be used to rapidly evaluate the prevalence of CRE in a population or unit. Three LNHs (2%) indicated that a point prevalence survey had been conducted during 2013. Of those three, one facility identified a previously unidentified CRE case.

Figure 3.5 Proportion of LNHs that have ever conducted a point prevalence survey

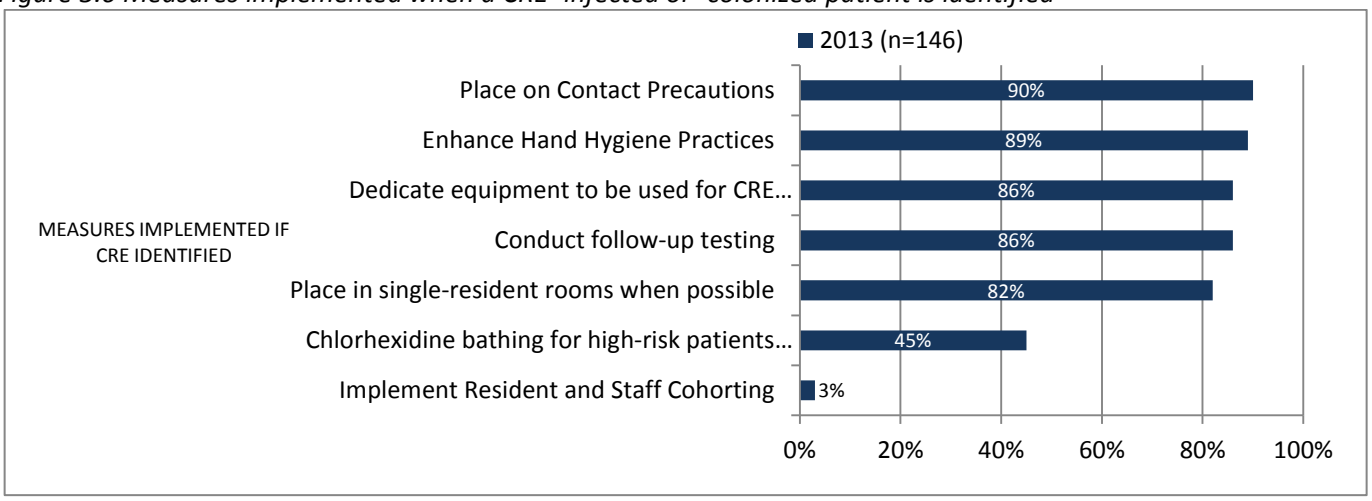


C. Infection Control & Prevention within Licensed Nursing Homes

The CDC recommends eight strategies to prevent CRE transmission in the healthcare setting. These strategies are outlined in the 2012 CRE Toolkit and include: 1) hand hygiene, 2) contact precautions, 3) healthcare personnel education, 4) minimizing use of invasive devices, 5) patient and staff cohorting, 6) laboratory notification, 7) promoting antimicrobial stewardship and 8) CRE screening. One objective of this survey was to understand how frequently each of these practices was implemented in LNHs.

The prevention strategies most frequently reported by respondents during 2013 included: 1) placing the patient on Contact Precautions (90%), 2) enhanced hand hygiene (89%), and 3) dedicated equipment and follow-up testing (86%).

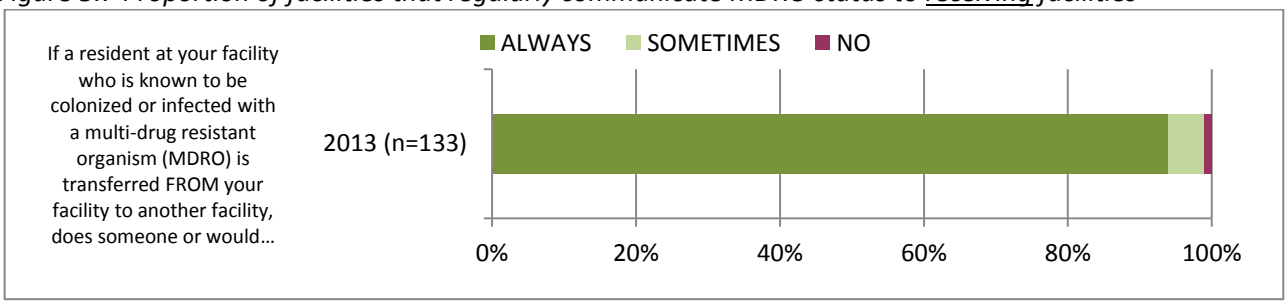
Figure 3.6 Measures implemented when a CRE- infected or -colonized patient is identified



2. Transferring OUT of facility. Inter-facility sharing of patients has the potential to facilitate transmission of CRE and other multi-drug–resistant organisms (MDROs).

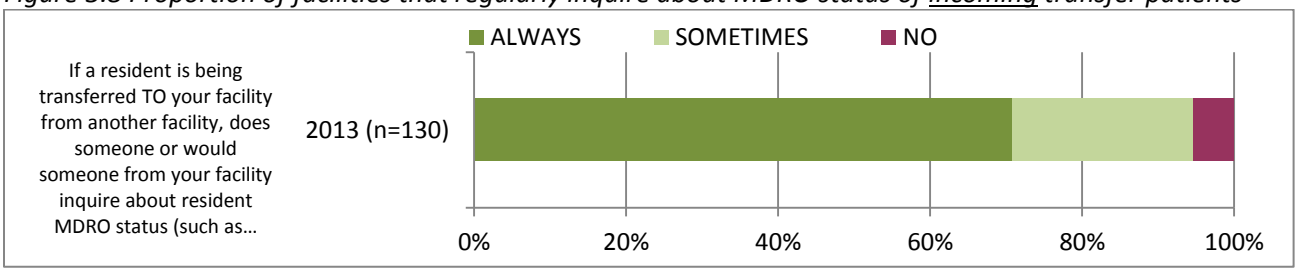
Ninety-nine percent of respondents (132/133) reported always or sometimes communicating MDRO/CRE status to receiving facilities. Communication most commonly occurred via transfer document (86%) and person-to-person notification (85%).

Figure 3.7 Proportion of facilities that regularly communicate MDRO status to receiving facilities



3. Transferring INTO facility. Ninety-five percent (123/130) of responding LNHs indicated they sometimes or always inquired about the CRE status of incoming patients. Of those, 92 (71%) facilities reported always inquiring. Of the facilities that did inquire about CRE status, person-to-person communication was the primary means of inquiry (89%), followed by use of transfer documents (85%).

Figure 3.8 Proportion of facilities that regularly inquire about MDRO status of incoming transfer patients

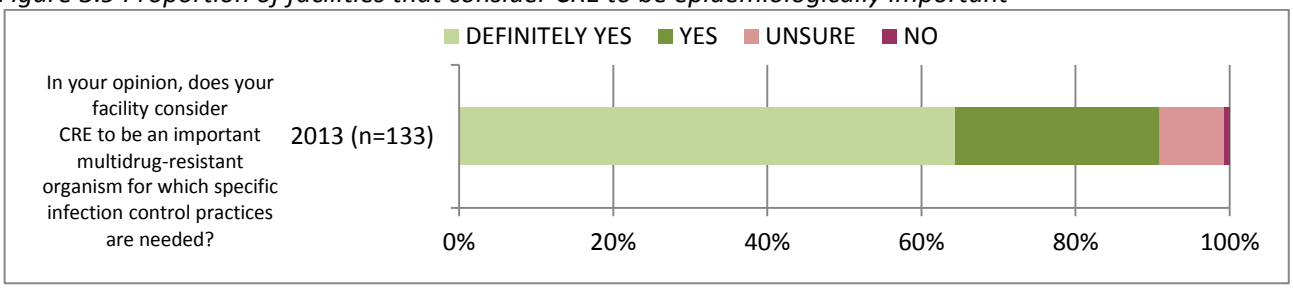


D. CRE as an Important Multi-Drug Resistant Organism (MDRO)

Controlling transmission of CRE in healthcare facilities is dependent upon healthcare facilities recognizing that these organisms are epidemiologically important.

One hundred twenty-one (91%) of responding LNHs indicated that CRE were important multidrug resistant organisms.

Figure 3.9 Proportion of facilities that consider CRE to be epidemiologically important

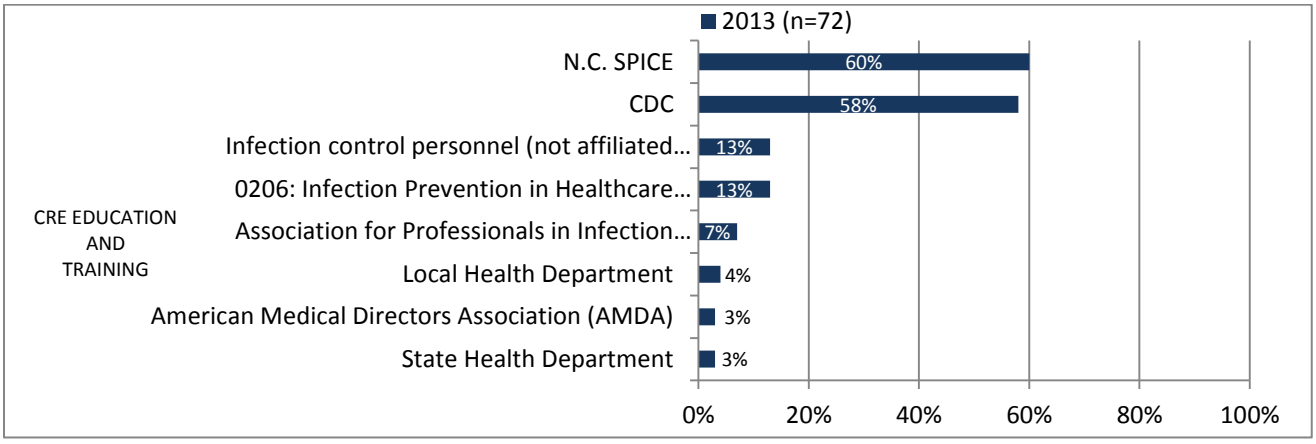


E. Education and Training on CRE

As CRE become increasingly prevalent, education and training to properly identify and prevent CRE (in addition to other MDROs) becomes critical to the public health response. LNH administrators and infection prevention staff were asked to specify receipt of CRE education or training.

Seventy-two (56%) LNH responders indicated staff members have received specific education or training regarding detection and/or prevention of CRE. Among those, 60% obtained CRE information from the N.C. Statewide Program for Infection Control and Epidemiology and 58% utilized CDC resources; 13% referred to other infection control personnel and the N.C. .0206 Infection Prevention in Healthcare Settings course.

Figure 3.10 Sources for education and training regarding CRE detection and/or prevention



Appendix A. Eligible Acute Care Hospitals by NCHA Region

FACILITY	COUNTY
REGION 1	
BLUE RIDGE REGIONAL HOSPITAL, INC	MITCHELL
CALDWELL MEMORIAL HOSPITAL, INC.	CALDWELL
CATAWBA VALLEY MEDICAL CENTER	CATAWBA
FRYE REGIONAL MEDICAL CENTER	CATAWBA
GRACE HOSPITAL, INC.	BURKE
MARGARET R. PARDEE MEMORIAL HOSPITAL	HENDERSON
MEDWEST HARRIS	JACKSON
MEDWEST HAYWOOD	HAYWOOD
MISSION HOSPITAL	BUNCOMBE
MURPHY MEDICAL CENTER, INC.	CHEROKEE
PARK RIDGE HEALTH	HENDERSON
RUTHERFORD REGIONAL MEDICAL CENTER	RUTHERFORD
THE MCDOWELL HOSPITAL	MCDOWELL
VALDESE GENERAL HOSPITAL, INC.	BURKE
REGION 2	
ALAMANCE REGIONAL MEDICAL CENTER	ALAMANCE
ANNIE PENN HOSPITAL	ROCKINGHAM
CONE HEALTH	GUILFORD
FORSYTH MEMORIAL HOSPITAL	FORSYTH
HIGH POINT REGIONAL HEALTH SYSTEM	GUILFORD
HUGH CHATHAM MEMORIAL HOSPITAL, INC.	SURRY
LEXINGTON MEDICAL CENTER	DAVIDSON
MEDICAL PARK HOSPITAL, INC.	FORSYTH
MOREHEAD MEMORIAL HOSPITAL	ROCKINGHAM
NORTH CAROLINA BAPTIST HOSPITAL	FORSYTH
NORTHERN HOSPITAL OF SURRY COUNTY	SURRY
RANDOLPH HOSPITAL, INC.	RANDOLPH
THOMASVILLE MEDICAL CENTER	DAVIDSON
WATAUGA MEDICAL CENTER, INC.	WATAUGA
WILKES REGIONAL MEDICAL CENTER	WILKES
REGION 3	
DUKE RALEIGH HOSPITAL	WAKE
DUKE UNIVERSITY HOSPITAL	DURHAM
DURHAM REGIONAL HOSPITAL	DURHAM
FRANKLIN REGIONAL MEDICAL CENTER	FRANKLIN
GRANVILLE HEALTH SYSTEM	GRANVILLE
JOHNSTON MEMORIAL HOSPITAL	JOHNSTON
MARIA PARHAM MEDICAL CENTER	VANCE
PERSON MEMORIAL HOSPITAL	PERSON
REX HOSPITAL	WAKE
UNIVERSITY OF NORTH CAROLINA HOSPITALS	ORANGE
WAKEMED	WAKE
WAKEMED CARY HOSPITAL	WAKE
REGION 4	
ALBEMARLE HOSPITAL	PASQUOTANK
CAROLINAEAST MEDICAL CENTER	CRAVEN
CARTERET GENERAL HOSPITAL	CARTERET
HALIFAX REGIONAL MEDICAL CENTER, INC.	HALIFAX
LENOIR MEMORIAL HOSPITAL, INC.	LENOIR
MARTIN GENERAL HOSPITAL	MARTIN
NASH GENERAL HOSPITAL	NASH
ONSLOW MEMORIAL HOSPITAL, INC.	ONSLOW
VIDANT EDGECOMBE HOSPITAL	EDGECOMBE
VIDANT BEAUFORT HOSPITAL	BEAUFORT
VIDANT DUPLIN HOSPITAL	DUPLIN
VIDANT MEDICAL CENTER	PITT
VIDANT ROANOKE-CHOWAN HOSPITAL	HERTFORD
WAYNE MEMORIAL HOSPITAL, INC.	WAYNE
WILSON MEDICAL CENTER	WILSON
REGION 5	
ANSON COMMUNITY HOSPITAL	ANSON
BETSY JOHNSON HOSPITAL	HARNETT
BRUNSWICK NOVANT MEDICAL CENTER	BRUNSWICK
CAPE FEAR VALLEY MEDICAL CENTER	CUMBERLAND
CENTRAL CAROLINA HOSPITAL	LEE
COLUMBUS REGIONAL HEALTHCARE SYSTEM	COLUMBUS
FIRSTHEALTH MOORE REG. HOSPITAL	MOORE
FIRSTHEALTH RICHMOND MEMORIAL HOSPITAL	RICHMOND
NEW HANOVER REGIONAL MEDICAL CENTER	NEW HANOVER
SAMPSON REGIONAL MEDICAL CENTER	SAMPSON
SANDHILLS REGIONAL MEDICAL CENTER	RICHMOND
SCOTLAND MEMORIAL HOSPITAL AND EDWIN MORGAN CENTER	SCOTLAND
SOUTHEASTERN REGIONAL MEDICAL CENTER	ROBESON
REGION 6	
CAROLINAS MEDICAL CENTER- LINCOLN	LINCOLN
CAROLINAS MEDICAL CENTER MERCY	MECKLENBURG
CAROLINAS MEDICAL CENTER PINEVILLE	MECKLENBURG
CAROLINAS MEDICAL CENTER	MECKLENBURG
CAROLINAS MEDICAL CENTER-NORTHEAST	CABARRUS
CAROLINAS MEDICAL CENTER-UNION	UNION
CAROLINAS MEDICAL CENTER-UNIVERSITY	MECKLENBURG
CLEVELAND REGIONAL MEDICAL CENTER	CLEVELAND
DAVIS REGIONAL MEDICAL CENTER	IREDELL
GASTON MEMORIAL HOSPITAL	GASTON
IREDELL MEMORIAL HOSPITAL, INC.	IREDELL
KINGS MOUNTAIN HOSPITAL	CLEVELAND
LAKE NORMAN REGIONAL MEDICAL CENTER	IREDELL
PRESBYTERIAN HOSPITAL	MECKLENBURG
PRESBYTERIAN HOSPITAL HUNTERSVILLE	MECKLENBURG
PRESBYTERIAN HOSPITAL MATTHEWS	MECKLENBURG
ROWAN REGIONAL MEDICAL CENTER	ROWAN
STANLY REGIONAL MEDICAL CENTER	STANLY

Appendix B. Eligible Licensed Nursing Homes by NCHA Region

FACILITY	COUNTY
REGION 1	
ABERNETHY LAURELS	CATAWBA
ASHEVILLE HEALTH CARE CENTER	BUNCOMBE
ASHEVILLE NURSING & REHABILITATION CENTER	BUNCOMBE
ASTON PARK HEALTH CARE CENTER INC	BUNCOMBE
AUTUMN CARE OF DREXEL	BURKE
AUTUMN CARE OF FOREST CITY	RUTHERFORD
AUTUMN CARE OF MARION	MCDOWELL
AUTUMN CARE OF SALUDA	POLK
AUTUMN CARE OF WAYNESVILLE	HAYWOOD
BEYSTONE HEALTH & REHABILITATION	HENDERSON
BRIAN CENTER HEALTH & REHABILITATION/HENDERSONVILLE	HENDERSON
BRIAN CENTER HEALTH & REHABILITATION/HICKORY EAST	CATAWBA
BRIAN CENTER HEALTH & REHABILITATION/SPRUCE PINE	MITCHELL
BRIAN CENTER HEALTH & REHABILITATION/WEAVERVILLE	BUNCOMBE
BRIAN CENTER HEALTH AND REHABILITATION HICKORY/VIEWMONT	CATAWBA
BRIAN CENTER HEALTH AND REHABILITATION/BREVARD	TRANSYLVANIA
BRIAN CENTER HEALTH AND REHABILITATION/WAYNESVILLE	HAYWOOD
BROOKS-HOWELL HOME	BUNCOMBE
BROOKSIDE REHABILITATION AND CARE	YANCEY
CAMELOT MANOR NURSING CARE FACILITY INC	CALDWELL
CAROLINA REHAB CENTER OF BURKE	BURKE
CAROLINA VILLAGE INC	HENDERSON
CLAY COUNTY CARE CENTER	CLAY
COLLEGE PINES HEALTH AND REHAB CENTER	BURKE
CONOVER NURSING AND REHABILITATION CENTER	CATAWBA
DEERFIELD EPISCOPAL RETIREMENT COMMUNITY INC	BUNCOMBE
ELDERBERRY HEALTH CARE	MADISON
EMERALD RIDGE REHABILITATION AND CARE CENTER	BUNCOMBE
FAIR HAVEN HOME	RUTHERFORD
FLESHER'S FAIRVIEW HEALTH CARE CENTER INC	BUNCOMBE
GATEWAY REHABILITATION AND HEALTHCARE	CALDWELL
GIVENS HEALTH CENTER	BUNCOMBE
GOLDEN LIVINGCENTER-ASHEVILLE	BUNCOMBE
GOLDEN LIVINGCENTER-HENDERSONVILLE	HENDERSON
GRACE HEIGHTS HEALTH AND REHABILITATION CENTER	BURKE
GRACE RIDGE	BURKE
GRAHAM HEALTHCARE AND REHABILITATION CENTER	GRAHAM
HENDERSONVILLE HEALTH AND REHABILITATION	HENDERSON
HIGHLAND FARMS	BUNCOMBE
LENOIR HEALTHCARE CENTER	CALDWELL
LIFE CARE CENTER OF BANNER ELK	AVERY
LIFE CARE CENTER OF HENDERSONVILLE	HENDERSON
MACON VALLEY NURSING AND REHABILITATION CENTER	MACON
MADISON HEALTH AND REHABILITATION	MADISON
MAGGIE VALLEY NURSING AND REHABILITATION	HAYWOOD
MAGNOLIA LANE NURSING AND REHABILITATION CENTER	BURKE
MOUNTAIN HOME HEALTH AND REHAB	HENDERSON
MOUNTAIN RIDGE HEALTH AND REHAB	BUNCOMBE
MOUNTAIN TRACE REHABILITATION & NURSING CENTER	JACKSON
MOUNTAIN VIEW MANOR NURSING CENTER	SWAIN
NC STATE VETERANS HOME-BLACK MOUNTAIN	BUNCOMBE
OAK GROVE HEALTHCARE CENTER	RUTHERFORD
PISGAH MANOR HEALTH CARE CENTER	BUNCOMBE
SHAIRE NURSING CENTER	CALDWELL
SILVER BLUFF LLC	HAYWOOD
SKYLAND CARE CENTER	JACKSON
SMOKY MOUNTAIN HEALTH AND REHABILITATION CENTER	HAYWOOD
STONECREEK HEALTH AND REHABILITATION	BUNCOMBE
SUNRISE REHABILIATION & CARE	MCDOWELL
THE LAURELS OF GREENTREE RIDGE	BUNCOMBE
THE LAURELS OF HENDERSONVILLE	HENDERSON
THE LAURELS OF SUMMIT RIDGE	BUNCOMBE
THE OAKS AT SWEETEN CREEK	BUNCOMBE
THE OAKS OF BREVARD	TRANSYLVANIA
TRINITY RIDGE	CATAWBA
TRINITY VILLAGE	CATAWBA
UNIVERSAL HEALTH CARE/FLETCHER	HENDERSON
VALLEY NURSING CENTER	ALEXANDER
VALLEY VIEW CARE AND REHABILITATION CENTER	CHEROKEE
WESTERN NORTH CAROLINA BAPTIST HOME	BUNCOMBE

FACILITY	COUNTY
WHITE OAK MANOR-RUTHERFORDTON	RUTHERFORD
WHITE OAK MANOR-TRYON	POLK
WILLOW RIDGE OF NC LLC	RUTHERFORD
WILLOWBROOKE COURT SC CENTER AT TRYON ESTATES	POLK
REGION 2	
ABBOTTS CREEK CENTER	DAVIDSON
ADAMS FARM LIVING & REHABILITATION	GUILFORD
ALAMANCE HEALTH CARE CENTER	ALAMANCE
ALLEGHANY CENTER	ALLEGHANY
ALSTON BROOK	DAVIDSON
ARBOR ACRES UNITED METHODIST RETIREMENT COMMUNITY INC	FORSYTH
ASHTON PLACE HEALTH & REHAB	GUILFORD
AUTUMN CARE OF MOCKSVILLE	DAVIE
AVANTE AT REIDSVILLE	ROCKINGHAM
AVANTE AT WILKESBORO	WILKES
BERMUDA COMMONS NURSING AND REHABILITATION CENTER	DAVIE
BERMUDA VILLAGE RETIREMENT CENTER	DAVIE
BLOWING ROCK REHAB DAVANT EXTENDED CARE CTR	WATAUGA
BLUMENTHAL JEWISH NURSING & REHAB CENTER	GUILFORD
BRIAN CENTER HEALTH & REHABILITATION/YANCEYVILLE	CASWELL
BRIAN CENTER HEALTH & RETIREMENT/WINSTON SALEM	FORSYTH
BRIAN CENTER HEALTH AND REHABILITATION/EDEN	ROCKINGHAM
BRIAN CENTER NURSING CARE/LEXINGTON	DAVIDSON
BROOKRIDGE RETIREMENT COMMUNITY	FORSYTH
CAMDEN PLACE HEALTH & REHAB LLC	GUILFORD
CENTRAL CONTINUING CARE	SURRY
CLAPP'S CONVALESCENT NURSING HOME INC	RANDOLPH
CLAPPS NURSING CENTER INC	GUILFORD
CLEMMONS NURSING & REHAB CENTER	FORSYTH
COUNTRYSIDE MANOR INC	GUILFORD
EDGEWOOD PLACE AT THE VILLAGE AT BROOKWOOD	ALAMANCE
FRIENDS HOMES AT GUILFORD	GUILFORD
FRIENDS HOMES WEST	GUILFORD
GLENBRIDGE HEALTH AND REHABILITATION	WATAUGA
GOLDEN LIVINGCENTER-GREENSBORO	GUILFORD
GOLDEN LIVINGCENTER-STARMOUNT	GUILFORD

FACILITY	COUNTY
GOLDEN LIVINGCENTER-SURRY COMMUNITY	SURRY
GREENHAVEN HEALTH AND REHABILITATION CENTER	GUILFORD
GUILFORD HEALTH CARE CENTER	GUILFORD
HEARTLAND LIVING & REHAB @ THE MOSES H CONE MEM HOSP	GUILFORD
HOMESTEAD HILLS	FORSYTH
JACOB'S CREEK NURSING AND REHABILITATION CENTER	ROCKINGHAM
KINDRED TRANSITIONAL CARE AND REHAB-SILAS CREEK	FORSYTH
LEXINGTON HEALTH CARE CENTER	DAVIDSON
LIBERTY COMMONS NSG & REHAB CTR OF SPRINGWOOD	FORSYTH
LIBERTY COMMONS NURSING & REHAB CTR OF ALAMANCE CTY	ALAMANCE
LIBERTYWOOD NURSING CENTER	DAVIDSON
MAPLE GROVE HEALTH AND REHABILITATION CENTER	GUILFORD
MARGATE HEALTH AND REHAB CENTER	ASHE
MARYFIELD NURSING HOME	GUILFORD
MOUNTAIN VISTA HEALTH PARK	DAVIDSON
OAK FOREST HEALTH AND REHABILITATION	FORSYTH
PEAK RESOURCES-ALAMANCE INC	ALAMANCE
PENN NURSING CENTER	ROCKINGHAM
PIEDMONT CROSSING	DAVIDSON
PINE RIDGE HEALTH AND REHABILITATION CENTER	DAVIDSON
PINEY GROVE NURSING AND REHABILITATION CENTER	FORSYTH
RANDOLPH HEALTH AND REHABILITATION CENTER	RANDOLPH
RIVER LANDING AT SANDY RIDGE	GUILFORD
SALEMTOWNE	FORSYTH
THE GRAYBRIER NURSING AND RETIREMENT CENTER	RANDOLPH
THE OAKS	FORSYTH
THE PRESBYTERIAN HOME OF HAWFIELDS INC	ALAMANCE
THE SHANNON GRAY REHABILITATION & RECOVERY CENTER	GUILFORD
TRIAD CENTER	GUILFORD
TRINITY GLEN	FORSYTH
TWIN LAKES COMMUNITY	ALAMANCE
TWIN LAKES COMMUNITY MEMORY CARE	ALAMANCE
UNIHEALTH POST-ACUTE CARE-ELKIN	SURRY
UNIHEALTH POST-ACUTE CARE-HIGH POINT	FORSYTH
UNIVERSAL HEALTH CARE/KING	STOKES
UNIVERSAL HEALTH CARE/RAMSEUR	RANDOLPH

FACILITY	COUNTY
VILLAGE CARE OF KING	STOKES
WALNUT COVE HEALTH AND REHABILITATION CENTER	STOKES
WELL-SPRING	GUILFORD
WESTCHESTER MANOR AT PROVIDENCE PLACE	GUILFORD
WESTWOOD HEALTH AND REHABILITATION CENTER	RANDOLPH
WESTWOOD HILLS NURSING AND REHABILITATION CENTER	WILKES
WHITE OAK MANOR-BURLINGTON	ALAMANCE
WHITESTONE: A MASONIC AND EASTERN STAR COMMUNITY	GUILFORD
WILKES SENIOR VILLAGE	WILKES
WILLOWBROOK REHABILITATION AND CARE CENTER	YADKIN
WINSTON SALEM NURSING & REHABILITATION CENTER	FORSYTH
WOODLAND HILL CENTER	RANDOLPH
YADKIN NURSING CARE CENTER	YADKIN
REGION 3	
BARBOUR COURT NURSING AND REHABILITATION CENTER	JOHNSTON
BRIAN CENTER HEALTH & RETIREMENT/CLAYTON	JOHNSTON
BRIAN CENTER HEALTH AND REHABILITATION/DURHAM	DURHAM
BRITTANY PLACE	WAKE
BRITTHAVEN OF CHAPEL HILL	ORANGE
BROOKSHIRE NURSING CENTER	ORANGE
CAPITAL NURSING AND REHABILITATION CENTER	WAKE
CAROL WOODS	ORANGE
CAROLINA MEADOWS HEALTH CENTER	CHATHAM
CARVER LIVING CENTER	DURHAM
CARY HEALTH AND REHABILITATION CENTER	WAKE
CHAPEL HILL HEALTHCARE AND REHABILITATION CENTER	ORANGE
CRABTREE VALLEY REHAB CENTER	WAKE
CROASDAILE VILLAGE	DURHAM
DAN E & MARY LOUISE STEWART HEALTH CENTER OF	WAKE
DURHAM NURSING & REHABILITATION CENTER	DURHAM
FRANKLIN OAKS NURSING AND REHABILITATION CENTER	FRANKLIN
GLENAIRE	WAKE
HILLCREST CONVALESCENT CENTER INC	DURHAM
HILLSIDE NURSING CENTER OF WAKE FOREST	WAKE
KERR LAKE NURSING AND REHABILITATION CENTER	VANCE
KINDRED NURSING AND REHABILITATION-HENDERSON	VANCE
KINDRED NURSING AND REHABILITATION-ZEBULON	WAKE

FACILITY	COUNTY
KINDRED TRANSITIONAL CARE AND REHAB-PETTIGREW	DURHAM
KINDRED TRANSITIONAL CARE AND REHAB-RALEIGH	WAKE
KINDRED TRANSITIONAL CARE AND REHAB-ROSE MANOR	DURHAM
KINDRED TRANSITIONAL CARE AND REHAB-SUNNYBROOK	WAKE
LIBERTY COMMONS NSG AND REHAB CTR OF JOHNSTON CTY	JOHNSTON
LITCHFORD FALLS HEALTHCARE AND REHABILITATION CENTER	WAKE
LOUISBURG NURSING CENTER	FRANKLIN
PEAK RESOURCES-TREYBURN	DURHAM
REX REHABILITATION AND NURSING CARE CENTER OF APEX	WAKE
ROXBORO HEALTHCARE & REHABILITATION CENTER	PERSON
SENIOR CITIZEN'S HOME INC	VANCE
SILER CITY CENTER	CHATHAM
SMITHFIELD MANOR INC	JOHNSTON
THE ARBOR	CHATHAM
THE CEDARS OF CHAPEL HILL	DURHAM
THE FOREST AT DUKE	DURHAM
THE LAURELS OF CHATHAM	CHATHAM
THE LAURELS OF FOREST GLENN	WAKE
THE OAKS AT MAYVIEW	WAKE
THE ROSEWOOD HEALTH CENTER	WAKE
TOWER NURSING AND REHABILITATION CENTER	WAKE
UNIHEALTH POST-ACUTE CARE OF DURHAM	DURHAM
UNIHEALTH POST-ACUTE CARE-CAROLINA POINT	ORANGE
UNIHEALTH POST-ACUTE CARE-RALEIGH	WAKE
UNIVERSAL HEALTH CARE / NORTH RALEIGH	WAKE
UNIVERSAL HEALTH CARE/FUQUAY-VARINA	WAKE
UNIVERSAL HEALTH CARE/OXFORD	GRANVILLE
WARREN HILLS, A PERSONAL CARE & NURSING FACILITY	WARREN
WELLINGTON REHABILITATION AND HEALTHCARE	WAKE
WINDSOR POINT CONTINUING CARE RETIREMENT COMMUNITY	WAKE
REGION 4	
AUTUMN CARE OF NASH	NASH
AVANTE AT WILSON	WILSON
AYDEN COURT NURSING AND REHABILITATION CENTER	PITT
BAYVIEW NURSING & REHABILITATION CENTER	CRAVEN
BRIAN CENTER HEALTH & REHABILITATION/WALLACE	DUPLIN

FACILITY	COUNTY
BRIAN CENTER HEALTH & REHABILITATION/WILSON	WILSON
BRIAN CENTER HEALTH & REHABILITATION/WINDSOR	BERTIE
BRIAN CENTER HEALTH AND REHABILITATION/GOLDSBORO	WAYNE
BRIAN CENTER HEALTH AND REHABILITATION/HERTFORD	PERQUIMANS
BROOK STONE LIVING CENTER	JONES
CAROLINA RIVERS NURSING AND REHABILITATION CENTER	ONSLOW
CHERRY POINT BAY NURSING AND REHABILITATION CENTER	CRAVEN
CHOWAN RIVER NURSING AND REHABILITATION CENTER	CHOWAN
COLONY RIDGE NURSING AND REHABILITATION CENTER	DARE
CREEKSIDE CARE & REHABILITATION CENTER	HERTFORD
CROATAN RIDGE NURSING AND REHABILITATION CENTER	CARTERET
CROSS CREEK HEALTH CARE	HYDE
CRYSTAL BLUFFS REHABILITATION AND HEALTH CARE CENTER	CARTERET
CYPRESS GLEN RETIREMENT COMMUNITY	PITT
DOWN EAST HEALTH AND REHABILITATION CENTER	GATES
ENFIELD OAKS NURSING AND REHABILITATION CENTER	HALIFAX
GOLDEN LIVINGCENTER-GREENVILLE	PITT
GOLDEN LIVINGCENTER-TARBORO	EDGECOMBE
GRANTSBROOK NURSING AND REHABILITATION CENTER	PAMLICO
GREENDALE FOREST NURSING AND REHABILITATION CENTER	GREENE
GREENFIELD PLACE LLC	PITT
HARBORVIEW HEALTH CARE CENTER	CARTERET
HARMONY HALL NURSING AND REHABILITATION CENTER	LENOIR
HERITAGE HEALTHCARE AT TAYLOR PLACE	CARTERET
HERITAGE HEALTHCARE OF FARMVILLE	PITT
HUNTER HILLS NURSING AND REHABILITATION CENTER	NASH
KENANSVILLE HEALTH & REHABIILTATION CENTER	DUPLIN
KINDRED TRANSITIONAL CARE AND REHAB-ELIZABETH CITY	PASQUOTANK
KINDRED TRANSITIONAL CARE AND REHAB-ROCKY MOUNT	NASH
KINSTON HEALTHCARE AND REHABILITATION CENTER	LENOIR
LIBERTY COMMONS NSG AND REHAB CTR OF HALIFAX COUNTY	HALIFAX
MOUNT OLIVE CENTER	WAYNE
NC STATE VETERANS NURSING HOME-KINSTON	LENOIR
NORTHAMPTON NURSING AND REHABILITATION CENTER	NORTHAMPTON
PREMIER NURSING AND REHABILITATION CENTER	ONSLOW
RICH SQUARE HEALTH CARE CENTER	NORTHAMPTON

FACILITY	COUNTY
RIDGEWOOD MANOR INC	BEAUFORT
RIVER TRACE NURSING AND REHABILITATION CENTER	BEAUFORT
RIVERPOINT CREST NURSING AND REHABILITATION CENTER	CRAVEN
ROANOKE LANDING NURSING AND REHABILITATION CENTER	WASHINGTON
ROANOKE RAPIDS HEALTHCARE AND REHABILITATION CENTER	HALIFAX
ROANOKE RIVER NURSING AND REHABILITATION CENTER	MARTIN
SCOTLAND MANOR HEALTH CARE CENTER	HALIFAX
SENTARA NURSING CENTER-CURRITUCK	CURRITUCK
SNUG HARBOR ON NELSON BAY	CARTERET
SOUTH VILLAGE	NASH
TARBORO NURSING CENTER	EDGECOMBE
THE FOUNTAINS AT THE ALBEMARLE	EDGECOMBE
THREE RIVERS HEALTH AND REHAB	BERTIE
UNIHEALTH POST-ACUTE CARE-NEUSE	CRAVEN
UNIHEALTH POST-ACUTE CARE-TRENT	CRAVEN
UNIVERSAL HEALTH CARE/GREENVILLE	PITT
UNIVERSAL HEALTH CARE/NASHVILLE	NASH
W. R. WINSLOW MEMORIAL HOME	PASQUOTANK
WARSAW HEALTH & REHABILITATION CENTER	DUPLIN
WILLOW CREEK NURSING AND REHABILITATION CENTER	WAYNE
WILMED NURSING CARE CENTER	WILSON
WILSON PINES NURSING AND REHABILITATION CENTER	WILSON
REGION 5	
AMBASSADOR HEALTH & REHAB OF WADESBORO LLC	ANSON
AUTUMN CARE OF BISCOE	MONTGOMERY
AUTUMN CARE OF FAYETTEVILLE	CUMBERLAND
AUTUMN CARE OF MYRTLE GROVE	NEW HANOVER
AUTUMN CARE OF RAEFORD	HOKE
AUTUMN CARE OF SHALLOTTE	BRUNSWICK
AZALEA HEALTH & REHAB CENTER	NEW HANOVER
BETHESDA HEALTH CARE FACILITY	CUMBERLAND
BRUNSWICK COVE NURSING CENTER	BRUNSWICK
CAROLINA REHAB CENTER OF CUMBERLAND	CUMBERLAND
CORNERSTONE NURSING AND REHABILITATION CENTER	HARNETT
CUMBERLAND NURSING AND REHABILITATION CENTER	CUMBERLAND
DAVIS HEALTH CARE CENTER	NEW HANOVER
ELIZABETHTOWN HEALTHCARE & REHABILITATION CENTER	BLADEN

FACILITY	COUNTY
EMERALD HEALTH & REHAB	HARNETT
GLENFLORA	ROBESON
GOLDEN LIVINGCENTER-LUMBERTON	ROBESON
GOLDEN YEARS NURSING HOME	CUMBERLAND
HARNETT WOODS NURSING AND REHABILITATION CENTER	HARNETT
HAYMOUNT REHABILITATION & NURSING CENTER INC	CUMBERLAND
HIGHLAND ACRES NURSING AND REHABILITATION CENTER	ROBESON
HIGHLAND HOUSE REHABILITATION AND HEALTHCARE	CUMBERLAND
HUNTINGTON HEALTH CARE	PENDER
INN AT QUAIL HAVEN VILLAGE	MOORE
KINDRED TRANSITIONAL CARE AND REHAB-CYPRESS POINTE	NEW HANOVER
KINGSWOOD NURSING CENTER	MOORE
LIBERTY COMMONS NSG AND REHAB CTR OF LEE COUNTY LLC	LEE
LIBERTY COMMONS NURSING AND REHAB CTR OF COLUMBUS CTY	COLUMBUS
LIBERTY COMMONS REHABILITATION CENTER	NEW HANOVER
MANOR CARE HEALTH SERVICES-PINEHURST	MOORE
MARY GRAN NURSING CENTER	SAMPSON
NORTH CAROLINA STATE VETERANS NURSING HOME	CUMBERLAND
NORTHCHASE NURSING AND REHABILITATION CENTER	NEW HANOVER
OCEAN TRAIL HEALTHCARE & REHABILITATION CENTER	BRUNSWICK
PEAK RESOURCES-PINELAKE	MOORE
PEMBROKE CENTER	ROBESON
PENICK VILLAGE	MOORE
PINEHURST HEALTHCARE & REHABILITATION CENTER	MOORE
POPLAR HEIGHTS CENTER	BLADEN
PREMIER LIVING AND REHAB CENTER	COLUMBUS
RICHMOND PINES HEALTHCARE AND REHABILITATION CENTER	RICHMOND
ROCKINGHAM MANOR	RICHMOND
SANFORD HEALTH & REHABILITATION CO	LEE
SCOTIA VILLAGE	SCOTLAND
SCOTTISH PINES REHABILITATION AND NURSING CENTER	SCOTLAND
SHORELAND HEALTH CARE AND RETIREMENT CENTER INC	COLUMBUS
SILVER STREAM HEALTH AND REHABILITATION CENTER	NEW HANOVER
SOUTHWOOD NURSING AND RETIREMENT CENTER	SAMPSON
ST JOSEPH OF THE PINES HEALTH CENTER	MOORE

FACILITY	COUNTY
THE REHABILITATION AND HEALTH CARE CTR AT VILLAGE GREEN	CUMBERLAND
TRINITY GROVE	NEW HANOVER
UNIVERSAL HEALTH CARE LILLINGTON	HARNETT
UNIVERSAL HEALTH CARE/BRUNSWICK	BRUNSWICK
WESLEY PINES RETIREMENT COMMUNITY	ROBESON
WESTFIELD REHABILITATION AND HEALTH CENTER	LEE
WHISPERING PINES NURSING & REHABILITATION CENTER	CUMBERLAND
WILMINGTON HEALTH AND REHABILITATION CENTER	NEW HANOVER
WOODBURY WELLNESS CENTER INC	PENDER
WOODLANDS NURSING & REHABILITATION CENTER	CUMBERLAND
REGION 6	
ALEXANDRIA PLACE	GASTON
ASBURY CARE CENTER	MECKLENBURG
AUTUMN CARE OF MARSHVILLE	UNION
AUTUMN CARE OF SALISBURY	ROWAN
AUTUMN CARE OF STATESVILLE	IREDELL
AVANTE AT CHARLOTTE	MECKLENBURG
AVANTE AT CONCORD	CABARRUS
BELAIRE HEALTH CARE CENTER	GASTON
BETHANY WOODS NURSING AND REHABILITATION CENTER	STANLY
BIG ELM RETIREMENT AND NURSING CENTERS	ROWAN
BRIAN CENTER HEALTH & REHABILITATION/SALISBURY	ROWAN
BRIAN CENTER HEALTH & REHABILITATION/STATESVILLE	IREDELL
BRIAN CENTER HEALTH & RETIREMENT/CABARRUS	CABARRUS
BRIAN CENTER HEALTH & RETIREMENT/LINCOLNTON	LINCOLN
BRIAN CENTER HEALTH & RETIREMENT/MONROE	UNION
BRIAN CENTER HEALTH & RETIREMENT/MOORESVILLE	IREDELL
BRIAN CENTER HEALTH AND REHABILITATION/CHARLOTTE	MECKLENBURG
BRIAN CENTER HEALTH AND REHABILITATION/GASTONIA	GASTON
BRIAN CENTER NURSING CARE/SHAMROCK	MECKLENBURG
BRIGHTMOOR NURSING CENTER	ROWAN
CARDINAL HEALTHCARE AND REHABILITATION CENTER	LINCOLN
CAROLINA CARE CENTER	GASTON
CARRINGTON PLACE	MECKLENBURG
CHARLOTTE HEALTH CARE CENTER	MECKLENBURG
CLEAR CREEK NURSING & REHABILITATION CENTER	MECKLENBURG
CLEVELAND PINES NURSING CENTER	CLEVELAND

FACILITY	COUNTY
COURTLAND TERRACE	GASTON
COVENANT VILLAGE INC	GASTON
FIVE OAKS MANOR	CABARRUS
FORREST OAKES HEALTHCARE CENTER	STANLY
GASTONIA HEALTHCARE AND REHABILITATION CENTER	GASTON
GOLDEN LIVINGCENTER-CHARLOTTE	MECKLENBURG
GOLDEN LIVINGCENTER-DARTMOUTH	MECKLENBURG
HUNTER WOODS NURSING AND REHABILITATION CENTER	MECKLENBURG
HUNTERSVILLE OAKS	MECKLENBURG
KINDRED NURSING AND REHABILITATION-LINCOLN	LINCOLN
KINDRED TRANSITIONAL CARE AND REHAB-MONROE	UNION
LAKE PARK NURSING AND REHABILITATION CENTER	UNION
LIBERTY COMMONS NSG AND REHAB CTR OF ROWAN CTY	ROWAN
MAGNOLIA ESTATES SKILLED CARE FACILITY	ROWAN
MAPLE LEAF HEALTH CARE	IREDELL
MEADOWWOOD NURSING CENTER	GASTON
MECKLENBURG HEALTH & REHABILITATION CENTER	MECKLENBURG
MOORESVILLE CENTER	IREDELL
NORTH CAROLINA STATE VETERANS NURSING HOME SALISBURY	ROWAN
OLDE KNOX COMMONS AT THE VILLAGES OF MECKLENBURG	MECKLENBURG
PAVILION HEALTH CENTER AT BRIGHTMORE	MECKLENBURG
PEAK RESOURCES-CHARLOTTE	MECKLENBURG
PEAK RESOURCES-CHERRYVILLE	GASTON
PEAK RESOURCES-GASTONIA	GASTON
PEAK RESOURCES-SHELBY	CLEVELAND
PINEVILLE REHABILITATION AND LIVING CENTER	MECKLENBURG
ROYAL PARK REHABILITATION & HEALTH CENTER	MECKLENBURG
SALISBURY CENTER	ROWAN
SARDIS OAKS	MECKLENBURG
SATURN NURSING AND REHABILITATION CENTER	MECKLENBURG
SHARON TOWERS	MECKLENBURG
SOUTHMINSTER	MECKLENBURG
STANLEY TOTAL LIVING CENTER INC	GASTON
STANLY MANOR	STANLY
THE CARRIAGE CLUB OF CHARLOTTE	MECKLENBURG
THE GARDENS OF TAYLOR GLEN RETIREMENT COMMUNITY	CABARRUS
THE LAURELS OF SALISBURY	ROWAN
THE OAKS AT TOWN CENTER	CABARRUS
THE PINES AT DAVIDSON	MECKLENBURG
THE STEWART HEALTH CENTER	MECKLENBURG
TRANSITIONAL HEALTH SERVICES OF KANNAPOLIS	CABARRUS
TRINITY OAKS	ROWAN
TRINITY PLACE	STANLY
UNIVERSAL HEALTH CARE AND REHABILITATION CENTER	CABARRUS
UNIVERSITY PLACE NURSING AND REHABILITATION CENTER	MECKLENBURG
WHITE OAK MANOR-CHARLOTTE	MECKLENBURG
WHITE OAK MANOR-KINGS MOUNTAIN	CLEVELAND
WHITE OAK MANOR-SHELBY	CLEVELAND
WHITE OAK OF WAXHAW	UNION
WILLOWBROOKE COURT SC CTR AT PLANTATION ESTATES	MECKLENBURG
WILORA LAKE HEALTHCARE CENTER	MECKLENBURG