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November 1, 2014

SENT VIA ELECTRONIC MAIL

The Honorable Justin Burr, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 307A, Legislative Office Building
Raleigh, North Carolina 27603-5925

The Honorable Mark Hollo, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 639, Legislative Office Building
Raleigh, North Carolina 27603-5925

The Honorable Ralph Hise, Co-Chair
Joint Legislative Oversight Committee on
Health and Human Services
North Carolina General Assembly
Room 1028, Legislative Building
Raleigh, North Carolina 27603

Senator Hise and Representatives Burr and Hollo:

Pursuant to the provisions of Section 12E.6.(b) of Session Law 2014-100, the North Carolina Department of Health and Human Services is pleased to provide you with the attached report outlining our strategic plan for the statewide Medical Examiner System.

Questions concerning this report may be directed to Dr. Lou Turner within the Division of Public Health at (919) 807-8960, or lou.turner@dhhs.nc.gov.

Sincerely,

Adam Sholar

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North Carolina Statewide Medical Examiner System Strategic Plan

**North Carolina
Department of Health and Human Services
Division of Public Health
Office of the Chief Medical Examiner**

November 1, 2014



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Executive Summary

Section 12E.6.(b) of Session Law 2014-100 requires the North Carolina Department of Health and Human Services (DHHS), Division of Public Health (DPH) to study and report by November 1, 2014 to the Joint Legislative Oversight Committee on Health and Human Services on all of the following:

- (1) The adequacy of the current fee paid by the State and counties (i) pursuant to G.S. 130A-387 for investigations and reports and (ii) pursuant to G.S. 130A-389 for autopsies. This portion of the report shall include recommendations for any fee increase deemed necessary by the Department, as well as an explanation and documentation to support the recommended fee increase.
- (2) Recommended categories of professionals that the Chief Medical Examiner may appoint as medical examiners.
- (3) Recommended qualifications of, and training requirements for, medical examiners.

North Carolina's current medical examiner (ME) system was implemented in 1972 as an improvement over the previous locally-managed coroner system, which mostly depended on elected lay individuals who were often not health professionals. This change sought to use trained physicians as MEs. General Statutes also created a system by which appointments of local MEs came under the umbrella of the state's Office of the Chief Medical Examiner (OCME) and which defined county responsibilities related to payment of ME and autopsy fees. Regional autopsy centers have developed organically over time in our state to the current structure as noted in Appendix 1. North Carolina has experienced significant population growth since implementation of the current ME system in 1972.

Comparison of North Carolina's ME system to that of other states is neither simple nor straightforward.

- There is no standardized death investigation system in the United State and there is no single standard structure for state medical examiner systems in our country. Variations among states include centralized models, county coroner systems, mixed county medical examiner and coroner systems, and decentralized systems.
- Similarly, there is variance among states regarding terminology to describe personnel who have roles and responsibilities in an ME system. Appendix 2 provides definitions of terms for North Carolina's ME system roles. Not all states, however, use these same definitions.
- There is also considerable variety in how states fund various components and functions of their ME systems, such as medicolegal death investigations, autopsies and transportation of bodies.

Appendix 3 provides a comparison of various components of North Carolina's ME system with four states (Maryland, New Mexico, Virginia and West Virginia) that have ME systems closest in structure to our state's system and which function under a state agency governance. Differences in other factors (such as population, geography and number of offices) still make comparisons of North Carolina's ME system with other state systems difficult.

In the context of this variety in structure, roles and duties, and financing of states' ME systems, there are published national standards for ME systems, which define minimum expectations for ME systems. North Carolina's ME system should be benchmarked against these standards.

- The National Association of Medical Examiners (NAME) defines expectations and performance standards for ME systems. NAME accreditation standards provide the best basis for evaluating North Carolina's ME system. North Carolina's ME system is not NAME accredited.
- Similarly, the American Board of Forensic Toxicology (ABFT) defines expectations and performance standards for forensic toxicology laboratories. The North Carolina OCME applied for ABFT accreditation on June 30, 2014, and anticipates an on-site inspection of the OCME toxicology laboratory in early 2015.

Previous studies of North Carolina's statewide ME system have been completed. These include:

- A 2001 Medical Examiner Study Group which made a total of 23 improvement recommendations to the DHHS Secretary.

- A 2004 review of the ME system was requested by the State Health Director, completed by the DHHS Office of Policy and Planning, and made 15 recommendations. A good number of these 2004 recommendations were similar to those made in the 2001 study.

Few recommendations from these studies, however, have been implemented, primarily due to lack of ME system funding in our state. Some facts about funding of state's ME systems are as follows:

- A 2001 national survey by NAME found the average state medical examiner system at that time was funded by approximately \$1.41 per capita annually, with a range of \$.34 per capita annually to \$3.20 per capita annually.
- The OCME received state appropriations of approximately \$4.39 million in state fiscal year (SFY) 2013–14, or approximately \$0.46 per capita for state funds for a population of over 9.5 million.
- Expansion funding of \$1 million for the OCME in SFY 2014–15 provided a total of approximately \$5.39 million in state appropriations. Applied against the current population of over 9.8 million, North Carolina invests state funds at approximately \$0.547 per capita (see Appendix 3 for comparisons of state funding to states with similar governance structures).
- When accounting for county average annual investments of approximately \$3.85 million per year (using a six calendar-year average for 2008–2013 for costs paid by counties for ME investigations and autopsies), North Carolina will invest approximately \$0.938 per capita using combined state and local funds for SFY 2014–15.
- The Scientific Working Group for Medicolegal Death Investigation's (SWGMDI) September 2013 publication titled "Regional Medicolegal Autopsy and Death Investigation Centers — Construction, Staffing and Costs" recommends a regional approach for ME systems and makes the following observations and recommendations regarding comprehensive funding for regional ME systems:
 - Annual funding of \$3.79 per capita was noted in 2012 by 31 NAME-accredited offices (19 county-based; 12 regional or state-based) reporting adequate or better than adequate facilities and staffing levels.
 - SWGMDI recommended a minimum annual funding of \$3.75 per capita to operate regional centers (includes investigation, autopsy, histology, body transport and basic radiography; excludes toxicology).

In 2013, the North Carolina DHHS began planning for improvements in the state's ME system. On August 28, 2013, DHHS Secretary Aldona Vos convened the partners of the OCME to discuss critical planning for strengthening the statewide ME system in North Carolina. Recommendations in this report are a result of input from stakeholders and approximately 18 months of study and planning. Key DHHS actions over the course of this planning effort are described in more detail in the full report.

DHHS offers the following recommendations for improving the state's medical examiner system. Details of the recommendations and cost estimates are provided in more detail in the full report.

Recommendations to support the statewide medical examiner (ME) system continuing to use a regional model (national recommendation), and to make one-time infrastructure investments to enhance and expand the existing regional structure so the ME system can move forward in meeting national accreditation standards.

Short Term

- (1) ***Upgrade the Medical Examiner Information System (MEIS)*** to meet national accreditation standards and to better support real-time field ME investigations and reporting, to improve data analysis for trends in cause of death, including required annual report(s), and for overall reporting and billing functions.
- (2) ***Continue to fully support statewide body transportation costs through centralized state resources and a master agreement.***

Mid-Term

- (1) *Develop a funding strategy to address the need for additional regional autopsy centers (to meet national accreditation standards associated with employing qualified personnel) and to address crumbling or undersized infrastructure in three existing regional autopsy centers (centers will currently not meet national accreditation guidelines and will not accommodate increased volumes of autopsies to continue to function long-term as regional autopsy centers)*
- (2) *Seek OCME national accreditation once prerequisites are met.
Seek accreditation of regional autopsy centers once prerequisites are met.*

Recommendations to improve the quality of death scene investigations

Short Term

- (1) *Increase the statutory ME fee from \$100/case to \$250/case.*
- (2) *Mandate ME orientation and training, and fund recurring training costs of \$100,000 at the OCME to support this effort.*

Mid-Term

- (1) *Evaluate the use of Medicolegal Death Investigators (MDIs) for the North Carolina medical examiner system, in addition to maintaining the existing system using appointed MEs.*
- (2) *Develop a strategy of state-local funding to provide 0.5 MDI FTEs per 100,000 population in our state (national recommendation).*

Recommendations to support existing statewide autopsy services

Short Term

- (1) *Fully support the three existing regional autopsy centers by reimbursing them for their actual current costs to perform autopsies.*
- (2) *Support additional forensic pathology fellowship positions (approximately \$250,000 recurring annually) at both WFU and ECU to provide a ready supply of trained forensic pathologists to support the OCME and regional autopsy centers. Fellowship programs are a vital part of succession planning for a statewide ME system.*

Introduction and Key Facts

Section 12E.6.(b) of Session Law 2014-100 requires the North Carolina Department of Health and Human Services (DHHS), Division of Public Health (DPH) to study and report by November 1, 2014, to the Joint Legislative Oversight Committee on Health and Human Services on all of the following:

- (1) The adequacy of the current fee paid by the State and counties (i) pursuant to G.S. 130A-387 for investigations and reports and (ii) pursuant to G.S. 130A-389 for autopsies. This portion of the report shall include recommendations for any fee increase deemed necessary by the Department, as well as an explanation and documentation to support the recommended fee increase.
- (2) Recommended categories of professionals that the Chief Medical Examiner may appoint as medical examiners.
- (3) Recommended qualifications of, and training requirements for, medical examiners.

Key functions of a statewide medical examiner system are:

- Investigations of deaths that occur under unusual or suspicious circumstances, including those deemed a possible threat to the public's health. The Office of the Chief Medical Examiner (OCME) investigates all deaths in North Carolina due to injury or violence, as well as natural deaths that are sudden and unexpected, suspicious, unusual or unattended by a medical professional. The OCME publishes guidelines regarding the types of deaths which should be investigated. Three years of data indicate an average of approximately 13.8 percent of total deaths in North Carolina were investigated as ME cases annually.
- Performance of autopsies to determine cause of death (the underlying event leading to death) and the manner of death (homicide, suicide, accident, natural or not determined). Not all medical examiner cases in North Carolina undergo autopsy. The OCME publishes guidelines for selection of medical examiner cases to autopsy. Three years of data indicate an average of approximately 5.0 percent of total deaths in North Carolina were autopsied annually.
- Review of data regarding deaths to identify patterns and reduce preventable deaths, especially for child fatalities. North Carolina's Child Fatality Prevention Team in the N.C. Child Fatality Prevention system, completes systematic, multidisciplinary and multiagency reviews of child fatalities in our state.

Industry-accepted qualities of effective medical examiner systems are:

- Death investigations and forensic pathology services are uniform and consistent, and should also be independent from population size, county budget variation and politics.
- Certification of death is accomplished by highly trained medical professionals who can integrate autopsy findings with those from the crime scene and the laboratory. The professionals have core competencies in assessing immediate and earlier medical history, interviewing witnesses and physical examination.
- Credentialing, training and continuing education of medical examiners and death investigators is uniform, as is coding of deaths; access to case files through archive and retrieval policies; criteria for exhumation and disposition of unclaimed bodies; and appeals processes.
- An information-technology system should permit access to its data with utility not only for criminal prosecutions but also for epidemiologic and surveillance purposes.
- Centralized administration provides statewide guidelines for case management and death scene investigation, 24-hour consultation with any site in the state (an especially important feature for isolated areas with infrequent cases), and economies of scale and purchasing power.
- A large cadre of forensic pathologists could give the state the flexibility to shift manpower in case of a mass disaster.
- An ideal statewide system has relationships with medical schools and subspecialty pathologists, forensic science laboratories and scientists, and public health systems and laboratories. Such proximity facilitates sharing of knowledge, system refinement and access to new technologies.

North Carolina's current medical examiner (ME) system was implemented in 1972 as an improvement over the previous coroner system, which mostly depended on elected lay individuals who were usually not health professionals. This 1972 change sought to use trained physicians as MEs and General Statutes also created a system by which appointments of local MEs came under the umbrella of the state's Office of the Chief Medical Examiner (OCME). Existing coroners were grandfathered during the 1972 changes. Currently, eight North Carolina counties still have elected coroners, four who are appointed by the OCME as MEs if they meet criteria for appointment. Counties with elected coroners are Bladen, Brunswick, Caswell, Cleveland, Columbus, Graham, Hoke and Yadkin. Criteria for ME appointments by the OCME were updated in Session Law 2014-100, Section 12E.6.(a) as requested by DHHS.

Regional autopsy centers have developed *de facto* over time in North Carolina since 1972. East Carolina University (ECU), Wake Forest University (WFU), Mecklenburg County and the OCME currently serve as regional autopsy centers, and their coverage areas are noted in Appendix 1. Currently, ECU completes approximately 600 autopsies per year, WFU completes approximately 826 autopsies per year, and Mecklenburg County completes approximately 630 autopsies per year.

The National Association of Medical Examiners (NAME) recommends that only board-certified forensic pathologists perform medicolegal autopsies; however, the limited availability of board-certified forensic pathologists nationwide makes this a challenge for most death investigation systems in our country. There are only approximately 500 practicing full time board-certified forensic pathologists nationwide.

- North Carolina's four regional autopsy centers (including the OCME) employ board-certified forensic pathologists to perform autopsies. Appendix 1 notes the locations in our state where non-board-certified forensic pathologists currently perform autopsies. Five facilities currently provide autopsy services without board-certified forensic pathologists. They are WestCare-Harris Regional Hospital, Piedmont Pathology Group, Southeastern Regional Medical Center, Sampson Regional Medical Center and Onslow Memorial Hospital.
- Approximately 19 percent of autopsies completed in SFY 2012–13 in North Carolina (734 of 3,803) were performed by non-board-certified forensic pathologists. Appendix 4 provides a breakdown of locations and numbers of autopsies performed in SFY 2012–13.
- It is not expected that the national supply of board-certified forensic pathologists will improve in the near future in order for North Carolina to meet NAME standards by hiring more board-certified forensic pathologists in North Carolina. Simply diverting over 700 autopsy cases annually to the four regional centers which employ only board-certified forensic pathologists is also neither practical nor affordable. ECU, WFU and Mecklenburg County do not have sufficient space or staff to accept this volume of autopsy cases. Furthermore, such a diversion would increase body transportation costs, and would require law enforcement partners to expend more in staff travel time and fuel costs to attend autopsies and to consult with forensic pathologists in death investigations.

Centralized functions in North Carolina's ME system which are completed by the staff at the OCME facility in Raleigh, North Carolina include:

- Review and approval of every medical examiner and autopsy report completed in the state. This quality assurance component reduces the availability of central OCME staff to actually perform autopsies.
- Review of medical examiner reports completed in the state.
- Toxicological analysis of specimens associated with all medical examiner cases investigated in the state. Centralization of toxicology services ensures consistency, quality assurance and cost savings. Under the supervision of the Chief Medical Examiner and managed by a board-certified Chief Toxicologist, the laboratory has experienced an increasing volume of toxicology samples and complexity of requests:
 - The laboratory performed 32,170 tests on ME cases in 2013.
 - The number of tests performed by the toxicology laboratory increased 12 percent over the five-year period of 2008–2013.
 - The number of tests completed in 2014 year-to-date is 4.4 percent higher than those completed as of September 18, 2013.

- Maintenance of the Medical Examiner Information System (MEIS), which stores statewide ME data since 1972. Current MEIS reporting functions include official results of death investigations, toxicology reports, autopsy reports, ME investigation reports and supplemental death certificates for cause of death.

Since 1972, changes in our state’s demographics have challenged the ME system. North Carolina’s population has nearly doubled, and it is now the 10th most populous state with 9,861,952 citizens (provisional statistics, North Carolina Office of State Budget and Management website, August 2014). There are also significant disparities in resources available for counties to fund the ME system, as evidenced by the North Carolina Department of Commerce’s three tier designations.

North Carolina General Statutes currently define state and county responsibilities related to financing the state’s ME system as follows:

- General Statute 130A-387 directs counties to pay a medical examiner fee of \$100 per ME case, unless the death or fatal injury occurs outside the county of residence, in which case the state pays the \$100 fee. A six calendar-year average (2008–2013) indicates counties annually pay approximately \$994,687 in ME fees for “in county” deaths (represents approximately 83 percent of all ME fees paid annually), and the state annually pays approximately \$170,335 in ME fees for “out of county” deaths (represents approximately 17 percent of all ME fees paid annually). The \$100 ME fee has not been updated since 2005.
- General Statute 130A-389 directs counties to pay an autopsy fee of \$1,250 per autopsy, unless the death or fatal injury occurs outside the county of residence, in which case the state pays the \$1,250 fee. A six calendar-year average (2008–2013) indicates counties annually pay approximately \$3,351,006 in autopsy fees for “in county” deaths (represents approximately 90 percent of all autopsy fees paid annually), and the state annually pays approximately \$320,708 in autopsy fees for “out of county” deaths (represents approximately 10 percent of all autopsy fees paid annually). The autopsy fee was recently increased from \$1,000 per autopsy to \$1,250 per autopsy in Session Law 2013-360 Section 12E. 8.(a).

DHHS also currently provides a supplemental payment of \$400 per autopsy to the three current regional autopsy centers in an effort to bridge the gap between their self-reported costs to complete an autopsy and the current statutory autopsy fee. As part of contract negotiations with the three regional autopsy centers for SFY 2014–15, Table 1 shows the three centers full costs for completing an autopsy (including indirect costs and overhead).

Table 1.
North Carolina Regional Autopsy Center Self-reported Costs
(Requirement for current (SFY 2014–15 contracts)

Center	Total cost per autopsy (includes indirect costs and all overhead costs)
East Carolina University	\$3,579
Wake Forest University	\$2,630
Mecklenburg County ME Office	\$2,816

- North Carolina General Statutes do not specifically address responsibility for costs of transportation of dead bodies, though body transportation represents a substantial cost to the state annually, and requires a significant time investment by employees at the four regional autopsy centers (includes the OCME). Some key facts about funding for transportation are:
 - When the statewide ME system was first established (conversion from a coroner system), the system was viewed as a state function and the OCME assumed transportation costs. General Statute 130A-381 provides the authorization for OCME to pay for this support service.
 - The state currently pays for all statewide body transportation costs through a master agreement with a network of transportation providers. Annual costs are approximately \$1 million. These costs have been increasing over time secondary to increases in fuel costs, increases in population and the number of ME cases, and changes in referral patterns and catchment areas.

- The Scientific Working Group for Medicolegal Death Investigation's (SWGMDI) September 2013 publication titled "Regional Medicolegal Autopsy and Death Investigation Centers — Construction, Staffing and Costs" recommends a regional approach for ME systems and recommends body transport distances should not exceed 100 miles in more than 10 percent of cases completed. North Carolina's geography challenges the ME system's ability to meet this recommendation. A centralized approach to transportation is the system's best option to achieve this.
- Rates for contracted dead body transporters have not been increased since 2004. The master agreement held by the OCME with transportation providers is subject to change through a Request for Proposals process in SFY 2014–15. Costs of transportation are expected to increase because there has been no change in the rates in 10 years.

Various studies of North Carolina's statewide ME system have been completed. A 2001 Medical Examiner study group made a total of 23 improvement recommendations to the DHHS Secretary. These recommendations addressed major goal areas which included:

- Regionalization of ME services
- Establishing a medicolegal death investigator (MDI) role
- Improving ME training and certification
- Broadening the ME system mission and optimizing the use of ME data
- Internal quality assurance and customer service
- Greater use of information technology (including an electronic reporting system)
- Strengthening the statutory authority of the ME system and
- Assuring adequate state and local resources to operate the ME system.

Of the 23 recommendations from the 2001 ME system study, two were fully implemented, three were partially implemented, and 18 were not implemented, primarily due to lack of funding. There have also been changes since this 2001 study was completed. Best practices have been updated, technology options have grown and inflation has created a higher cost of doing business for the ME system.

Similarly, a 2004 review of the ME system was requested by the State Health Director and was completed by the DHHS Office of Policy and Planning. This study offered 15 recommendations around the following topics:

- Develop model for regionalization
- Establish the medicolegal death investigator position in North Carolina
- Abolish the North Carolina coroner system
- Establish minimum training and continuing education hours for pathologists and local medical examiners
- Research alternative funding
- Enhance information technology
- Adopt a standard fee schedule for provided services
- Evaluate toxicology lab operations
- Disaster and bioterrorism preparedness and
- Performance standards.

A majority of the 15 recommendations made in 2004 demonstrated overlap with the recommendations of the 2001 study. Of the 15 recommendations from the 2004 ME system study, six were implemented, one was partially implemented, and eight were not implemented, primarily due to lack of funding.

Some facts about funding of state ME systems are as follows:

- A 2001 national survey by NAME found the average state medical examiner system at that time was funded by approximately \$1.41 per capita annually, with a range of \$0.34 per capita annually to \$3.20 per capita annually.

- The OCME received state appropriations of approximately \$4.39 million in state fiscal year (SFY) 2013–14, or approximately \$0.46 per capita for state funds for a population of over 9.5 million.
- Expansion funding of \$1 million for the OCME in SFY 2014–15 provided a total of approximately \$5.39 million in state appropriations. Applied against the current population of over 9.8 million, North Carolina invests state funds at approximately \$0.547 per capita (see Appendix 3 for comparisons of North Carolina’s state ME system funding to that of states with similar governance structures).
- When accounting for county average annual investments of approximately \$3.85 million per year (using a six calendar-year average for 2008–2013 for costs paid by counties for ME investigations and autopsies), North Carolina will invest approximately \$0.938 per capita using combined state and local funds for SFY 2014–15.
- SWGMDI’s September 2013 publication titled “Regional Medicolegal Autopsy and Death Investigation Centers — Construction, Staffing and Costs” recommends a regional approach for ME systems and makes the following observations and recommendations regarding comprehensive funding for regional ME systems:
 - Annual funding of \$3.79 per capita was noted in 2012 by 31 NAME-accredited offices (19 county-based; 12 regional or state-based) reporting adequate or better than adequate facilities and staffing levels.
 - SWGMDI recommended a minimum annual funding of \$3.75 per capita to operate regional centers (includes investigation, autopsy, histology, body transport and basic radiography; excludes toxicology).

Comparison of North Carolina’s ME system to that of other states is neither simple nor straightforward, for the following reasons:

- There is no standardized death investigation system in the United States and there is no single standard structure for state medical examiner systems in the United States. Variations among states include centralized models, county coroner systems, mixed county medical examiner and coroner systems, and decentralized systems.
- Similarly, there is variance among states regarding terminology to describe personnel who have roles and responsibilities in an ME system. Appendix 2 provides definitions of terms for North Carolina’s ME system roles. Not all states, however, use these same definitions.
- There is also considerable variety in how states fund various components and functions of their ME systems, such as medicolegal death investigations, autopsies and transportation of bodies.

Appendix 3 provides a comparison of various components of North Carolina’s ME system with four states (Maryland, New Mexico, Virginia and West Virginia) that have ME systems closest in structure to our state’s system and which function under a state agency governance. Differences in other factors (such as population, geography and number of offices) still make comparisons of North Carolina’s ME system with other state systems difficult.

In the context of this variety in structure, roles and duties, and financing of states’ ME systems, there are published national standards for ME systems, which define minimum expectations for accredited ME systems. North Carolina’s ME system should be benchmarked against these standards.

- The National Association of Medical Examiners (NAME) defines expectations and performance standards for ME systems. NAME accreditation standards provide the best basis for evaluating North Carolina’s ME system. North Carolina’s ME system is not NAME accredited. Appendix 5 provides a summary of national accreditation standards which are currently not met by North Carolina’s ME system. Some standards are actively being pursued by DHHS and the OCME.
- Similarly, the American Board of Forensic Toxicology (ABFT) defines expectations and performance standards for forensic toxicology laboratories. The North Carolina OCME applied for ABFT accreditation on June 30, 2014, and anticipates an on-site inspection of the OCME toxicology laboratory in early 2015.

Recent DHHS Actions, Findings and Recommendations to Improve the Statewide Medical Examiner System

In 2013, the North Carolina DHHS began planning for improvements in the state's ME system. On August 28, 2013, DHHS Secretary Aldona Wos convened the partners of the OCME to discuss critical planning for strengthening the statewide medical examiner system in North Carolina. These stakeholders also provided subsequent improvement suggestions. Appendix 6 provides a brief summary of attendees and improvements recommended.

Recommendations that follow are a result of input from stakeholders, approximately 18 months of study and planning by DHHS/OCME, documented best practices nationwide, and benchmarks which must be met to achieve national accreditation from NAME and ABFT.

The DHHS/OCME makes recommendations for improvements in the state's ME system with the following caveats:

- NAME sets accreditation standards for ME systems.
 - There are no other national accrediting bodies for ME systems.
 - NAME's minimum standards describe basic services and functions which an ME system should provide its citizens to ensure accuracy of and confidence in the system's findings related to manner and cause of death. Families of decedents as well as law enforcement partners require and deserve to have this confidence in their ME system.
 - North Carolina's statewide ME system has not yet achieved NAME accreditation.
- Existing OCME budgeted resources (state appropriations and autopsy/ME fees) are not sufficient to support existing ME system services, nor are they adequate to make the multiple system-wide improvements necessary to move North Carolina toward meeting NAME accreditation standards.
 - Any increases in funding to the OCME, regardless of the source, should not be offset by reductions in existing funding (state appropriations). This action will result only in a system that maintains the status quo and which currently is not sufficient to serve its many customers.
 - Current funding gaps are described in these recommendations, as are new activities which must be implemented for North Carolina's ME system to meet minimum NAME standards.
- Recommendations are made in three broad topic areas; each topic area includes recommendations for:
 - **Short term actions** to stabilize the current system in its existing regional structure. These are actions DHHS believes can be implemented in a short time frame and are critical to immediately improve the ME system.
 - **Mid-term actions** to build increased and new capacities to improve the ME system and to meet national accreditation standards.

Recommendations to support the statewide medical examiner (ME) system using a regional model (national recommendation), and to make one-time infrastructure investments to enhance and expand the existing regional structure so the ME system can move forward in meeting national accreditation standards.

Short Term

Continue centralized state-funded infrastructure functions currently provided by the OCME (toxicology, Medical Examiner Information System, quality assurance, transportation), and improve their capacity.

- (1) ***Upgrade the Medical Examiner Information System (MEIS)*** to meet national accreditation standards and to better support real-time field ME investigations and reporting, to improve data analysis for trends in cause of death and for overall reporting and billing functions.

DHHS Actions:

- In 2014, DHHS completed an analysis of user requirements for a robust MEIS, compared requirements against the existing system, and completed costs estimates for upgrades to the MEIS.
- DHHS identified internal resources (two full time equivalents, or FTEs — one programmer and one operations) to support the MEIS system upgrades and ongoing system functions.
- DHHS also identified an internal resource (one FTE) to serve as an Information Specialist. This role is critical to satisfying the multiple requests for information, data and reports from citizens, legislators and other stakeholders.
- An additional internal DHHS resource was identified (one FTE Epidemiologist) to complete ME system data analysis to identify trends in the health of North Carolina's citizens to better direct resources to improve health.

Findings:

- The OCME's current MEIS is based on obsolete technology first implemented in 1972 on the University of North Carolina at Chapel Hill's IBM mainframe housing administrative data. Conversion of MEIS data from IBM files to a relational database occurred in the mid-1990s and implementation of its first production applications was accomplished by 1998. The conversion necessitated adoption of a myriad of technologies framed on Sun Server microchip capability. This capability is 15 years old, is no longer supported and requires changing the application modules in order to update to a supportable technology.
- The MEIS is not accessible by all MEs in the state, and real-time reporting is not supported by the MEIS.
- Currently, billing invoices are manually constructed by OCME staff from ME investigation and autopsy reports received. **Such manual processes are highly inefficient, wasteful of resources** and do not facilitate efficient data tracking and reporting.
- The OCME also does not have an established system to respond to and track requests for information, data and reports from citizens, legislators and other stakeholders. **The absence of such a system hinders the OCME's ability to provide excellent service to all its customers.**
- Additionally, statewide medical examiner data are an important element in understanding the health of North Carolina's population and in determining how to best direct resources to improve health outcomes of our citizens. Analyzing death data, identifying important public health trends in the medical examiner data, and annually reporting these data to stakeholders is a NAME accreditation benchmark for best practices in medical examiner systems.

Two options are to be considered and pursued for an upgrade to the current Medical Examiner Information Systems:

- **In-house technology upgrade** - The Estimated costs for an in-house technology upgrade are \$1.655 million (non-recurring) and \$20,000 (recurring), with an optional non-recurring mobile device cost of \$540,000. Estimates do not include ongoing support of mobile devices for field use by MEs (mobile connectivity, security and information technology staff support).
- **COTS (Commercial Off the Shelf) Solution** - A Request For Information (RFI) approach is being used to substantiate vendor product availability and cost that might be considered as an alternate integrated MEIS solution. The Estimates from the in-house technology upgrade do not reflect an off the shelf product approach.

(2) *Continue to fully support statewide body transportation costs through centralized state resources and a master agreement.*

DHHS Actions:

- Reviewed the existing statewide body transportation system and existing body transportation agreement.
- Currently preparing a Request for Proposals (RFP) for an update in the ME system's statewide body transportation agreement.

Findings:

- When the current statewide ME system was established in 1972, the state absorbed the burden of this cost because counties were required to transport dead bodies to regional autopsy centers (rather than being handled locally with coroners). This function is currently completed in an efficient and effective manner by the OCME.
- Though state law does not specifically define an entity responsible for this function, statewide oversight of this critical function is needed to:
 - Ensure consistent guidelines and standards for transporters are clearly communicated, monitored and enforced.
 - Reduce the potential for the appearance of favoritism in service provision at the local level.
 - Account for the fact that current transporters serve more than one county and also serve more than one existing regional autopsy center.
 - Reduce the logistical burden to existing regional autopsy centers that would be required if they negotiate and monitor multiple contracts with transporters (instead of the state completing these functions with a master agreement).

Funds provided in the SFY 2014–15 OCME budget expansion item of \$1 million will fill the gap for historical shortfalls in funds in the OCME budget to cover transportation costs.

Transportation rates, however, have not been adjusted since 2004 and have not kept pace with increased fuel costs. With the new RFP process, body transportation costs are expected to increase, therefore, ***future inflationary adjustments to account for new transportation rates will need to be considered for the OCME to continue this centralized function.***

Mid-Term

- (1) *Develop a funding strategy to address the need for additional regional autopsy centers (to meet national accreditation standards associated with employing qualified personnel) and to address crumbling or undersized infrastructure in three existing regional autopsy centers (centers will currently not meet national accreditation guidelines and will not accommodate increased volumes of autopsies to continue to function long-term as regional autopsy centers)***

DHHS Actions:

- To achieve the goal of ensuring all medicolegal autopsies are performed by a board-certified forensic pathologist, DHHS/OCME sought enhanced geographical coverage by the three existing regional centers. As a result, ECU has accepted additional cases (such as homicides) previously served by Onslow Memorial Hospital (which uses non-board-certified forensic pathologists), and WFU has also accepted additional cases from Watauga County and Piedmont Pathology (which uses non-board-certified forensic pathologists). Both ECU and WFU now also perform autopsies on decomposed human remains.
- Beginning in September 2013, DHHS/OCME also reached out to potential partners for consideration to host two additional regional autopsy centers. As of July 2014, Mission Hospital was not interested in pursuing establishing a regional autopsy center. OCME is still in dialogue with the Campbell University School of Osteopathic Medicine; however, Campbell does not have the clinical sites available to serve as a regional center and is not expected to have capacity to undertake this role in the immediate future.
- OCME worked with DHHS Property and Construction in August 2014 to update previous (2008) cost data for a new free-standing regional autopsy facility constructed by the state.

- In August 2014, OCME also solicited cost estimates for the three existing regional autopsy centers to make infrastructure upgrades necessary to continue serving in a regional capacity and to move towards meeting NAME accreditation standards.

Findings:

SWGMDI recommends body transport distances should not exceed 100 miles in more than 10 percent of cases completed. SWGMDI further recommends minimum population catchment areas for regional coverage should be targeted at 500,000 (unless rendered impractical by geography or square mileage of coverage area). An additional regional autopsy center in each of the eastern and western sections of North Carolina would result in six regional centers (the OCME serves a region). This would reduce travel time and costs for body transportation and move our state closer to SWGMDI's recommendation.

It is also estimated that two new regional autopsy centers would be required to meet the national accreditation standard that all autopsies be performed by board-certified forensic pathologists, and to more effectively serve rural counties in the far eastern and far western counties in our state.

- Approximately 19 percent of medicolegal autopsies completed in SFY 2012–13 in North Carolina (734 of 3,803) were performed by non-board-certified forensic pathologists.
- There are only approximately 500 practicing full time board-certified forensic pathologists nationwide, and competition to employ them is fierce.
- It is not expected that the national supply of board-certified forensic pathologists will improve in the near future in order to meet national standards by hiring more board-certified forensic pathologists.
- Simply diverting over 700 autopsy cases annually to the four existing regional centers which currently employ only board-certified forensic pathologists is neither practical nor affordable. Regional centers currently do not have space or staff to accommodate these additional cases. Such a diversion would also increase body transportation costs, and would require law enforcement partners to expend more resources in staff travel time and fuel costs to attend autopsies and to consult with forensic pathologists in death investigations.
- A total of six regional autopsy centers in the state would reduce the maximum number of counties served by a single autopsy center and provide quicker turnaround of autopsy results for families and other customers.
- State-owned construction for two facilities should be considered (in the size and design similar to Mecklenburg County ME facility). In order to provide the best statewide coverage (and relative to existing regional centers) preferred locations for two additional regional autopsy facilities are in the Southeastern region (Wilmington) and Western region (Asheville/Edneyville) of the state.
- Ongoing operational support for two new regional autopsy centers would also need to be considered.
- ECU's regional autopsy center is 25 years old (built in 1989). WFU's facility is 73 years old (built in 1941).
 - Neither facility can be expanded within its existing footprint to accept more autopsy cases as a regional provider.
 - Both centers would also require newly-constructed facilities to meet national accreditation standards. They do not have sufficient autopsy table space, body storage space, x-ray equipment space, body management and admission space or staff space to support more autopsies or to meet minimum square footage standards for accreditation.
 - They also lack a myriad of features that would be barriers to meeting accreditation standards. Some examples are inadequate security, ventilation, explosion proof storage for flammable materials, lighting and refrigeration.
- The missions of both ECU and WFU are not intricately tied to the mission of the OCME, and both organizations have reported they are unlikely to invest in capital improvements to these facilities for an ME system that General Statutes directs the state to operate.
- State-owned construction to replace the current ECU and WFU facilities should be considered (in the size and design similar to Mecklenburg County ME facility). Ongoing operational support could be assumed by the contractor through the existing method of funding (contract funds from the OCME and statutory autopsy fees).

- The Mecklenburg County ME will also require additions to its current facility to expand regional coverage, or to meet national accreditation standards. This includes needs for additional autopsy space and staff space. The Mecklenburg County ME facility was designed and constructed with future expansion potential and with land already available.

If the General Assembly chooses to consider two new regional autopsy centers:

- Estimated one-time cost (using purchased or state-owned land) for construction of a single new state-owned autopsy facility in either Wilmington or Asheville is \$12,383,000 per facility.
- Estimated one-time cost for equipment purchases for a single free-standing state-owned autopsy facility is \$650,000 per facility.
- Recurring costs of operating a single new regional autopsy center are estimated at \$705,000 annually for salary and fringes (eight FTEs) and \$474,955 annually for operations and maintenance.

If the General Assembly chooses to consider replacement autopsy centers for ECU and WFU, estimated one-time construction cost for replacement of the ECU facility (using purchased state-owned land) would be \$11,526,000. Estimated one-time construction cost for replacement of the WFU facility is \$12,383,000.

If the General Assembly chooses to consider infrastructure upgrades to the Mecklenburg County ME office, Mecklenburg County has self-reported estimates of approximately \$750,000 for expansion of its existing facility.

(2) *Seek OCME national accreditation once prerequisites are met.*

Seek accreditation of regional autopsy centers once prerequisites are met.

DHHS Actions:

- NAME recommends a caseload of 250 autopsies per year for each board-certified forensic pathologist. Each pathologist at the Raleigh-based OCME carried between 350–400 cases in State Fiscal Year (SFY) 2012–13. Recent improvements in the OCME's ability to hire board-certified forensic pathologists have resulted in the OCME currently tracking at 270 cases per year for each forensic pathologist for the current SFY.
 - DHHS sought legislative permission to enhance salaries for OCME forensic pathologists to improve recruitment efforts. Salaries were updated in June 2013.
 - In November 2013, DHHS secured temporary staffing for completing autopsies at the OCME
 - OCME now has four of four permanent forensic pathologist positions filled. The Chief ME (forensic pathologist) position is filled. A Deputy Chief (forensic pathologist) position is vacant but the OCME is currently interviewing qualified applicants. A forensic pathologist fellow (training) position is vacant and will be filled in June 2015.
 - OCME is approved for a second forensic pathology fellowship position. DHHS has identified an internal resource (one FTE) to fund a forensic pathology fellow position at the OCME for SFY 2015–16.
- NAME also requires ME systems to utilize a toxicology laboratory accredited by the American Board of Forensic Toxicology (ABFT).
 - The OCME's toxicology laboratory completed laboratory manual standard operating procedures and policies in anticipation of an accreditation application.
 - The OCME's toxicology laboratory applied for accreditation on June 30, 2014, and expects a site visit from ABFT in early 2015. Funding to support accreditation fees was included in the \$1 million expansion budget item for the OCME for SFY 2014–15.
 - DHHS has identified existing internal resources to support two chemist positions at the OCME's toxicology laboratory.
- The OCME is likewise developing, reviewing and disseminating written policies and procedures.

Findings:

- North Carolina's ME systems is currently not NAME accredited. Appendix 5 outlines multiple steps needed for the OCME to meet the rigorous requirements for NAME accreditation.

- It is anticipated the OCME would initially meet NAME accreditation standards first, with regional autopsy centers being staged in over time.

Recommendations to improve the quality of death scene investigations

Short Term

- (1) *Increase the statutory ME fee from \$100/case to \$250/case.*

DHHS Actions:

- Recommended change in General Statute 130A-382, which addresses county medical examiner appointments. Session Law 2014-100 directs the Chief Medical Examiner to give preference to licensed physicians in appointing a medical examiner for each county, but also allows appointment of licensed physician assistants, nurse practitioners, nurses, coroners or emergency medical technician paramedics.
- Investigated innovative approaches such as identifying local emergency medical service providers (EMS) to serve in the role of medical examiners. Surry County's use of local EMS staff has been reviewed and could serve as a model for this. DHHS' Office of Emergency Medical Services' staffs have been consulted for ideas to improve recruitment of EMS staff. Local EMS providers and EMS organizations have been consulted for assistance in such recruitment.
- OCME is working with regional pathology centers and local health agencies to identify more appropriate candidates to serve as medical examiners.

Findings:

- North Carolina does not have enough qualified local MEs to keep pace with state's growing population and demand for death investigations. The OCME prefers only licensed physicians be appointed as MEs but recognizes this is likely unattainable in the near future in our state. The demands on physicians' time and the current \$100 reimbursement fee for ME cases have challenged the OCME's ability to recruit and retain physicians as MEs.
- OCME has enlisted the assistance of local partners to recruit additional local MEs, including reaching out to EMS systems and EMS providers as potential MEs.
 - Feedback from current MEs indicates recent recruitment efforts are hampered by litigation concerns of potential MEs and by lack of adequate compensation for time and travel associated with completing and reporting ME cases.
 - Anecdotally, physician MEs often note their costs of transcription, supplies, filing of reports and transportation to and from death scenes are greater than their current reimbursement of the \$100 ME fee. They are essentially completing ME work as a community service and at a financial loss.
 - Since September 2013, 56 medical examiners have been added statewide but 63 medical examiners are no longer active (a statewide net loss).
- MEs in our state do not complete ME work on a full-time basis. North Carolina has essentially a volunteer ME system.
- The statutory fee for investigating and completing a medical examiner case is \$100, has not been updated since 2005, and has not kept pace with increased fuel and supply costs.
- Other states ME fees are variable.
 - In Virginia, where the local ME is a physician, the fee is \$150 per case, plus \$50 if the scene is visited. The OCME is uncertain how Virginia verifies scene visits.
 - In West Virginia, the ME fee is \$125 per case, or \$200 per case if the scene is visited. If the ME is called and declines to accept the death as an ME case, the ME is paid \$25 for taking a call. If the ME completes a long form on an infant death, the ME is paid \$350. If the ME completes a report on a case that is already buried or cremated (no scene, no body), the ME is paid \$125.
 - In Maryland, the ME is paid \$80 per case. If the ME is called but the case is not taken as a ME case, the ME is paid \$10. The district medical examiner, a physician, is paid an additional \$25 to certify a death and to sign the death certificate.
 - North Carolina does not pay its MEs for taking calls when the death is determined to not require an ME investigation.

- An ME fee increase will not provide additional revenue for the OCME.
 - General Statutes direct the OCME to pay both ME and autopsy fees to providers of these services when a death or fatal injury occurs outside the decedent's county of residence.
 - These out-of-county ME fees paid by the OCME account for approximately 17 percent of total annual ME fee costs in the state.
 - Any offset in current funding (relative to a proposed ME fee increase) will not improve the operational budget for the OCME and will not move the ME system forward.

If the General Assembly chooses to increase the statutory ME fee, using six-year (calendar year) average costs, the estimated statewide cost (to counties and to the OCME) to increase the ME fee from \$100/case to \$250/case is \$1,490,420. This estimate assumes the current statutory language defining state and county payment responsibilities for ME fees is unchanged.

(2) *Mandate ME orientation and training, and fund recurring training costs of \$100,000 at the OCME to support this effort.*

DHHS Actions:

- DHHS/OCME has been assessing ME orientation and training for some time.
 - An annual seminar for MEs was previously hosted by the OCME but was suspended in secondary to lack of funding and staff resources.
 - In July and August 2014, the OCME reached out to the North Carolina Area Health Education Centers (AHECs) and other potential partners to assess their potential roles as partners in restarting this annual seminar, as well as in delivering ongoing annual ME training. OCME is continuing to review its options for selecting partners to assist in training efforts.
 - OCME is also considering various formats for delivery of training to reach MEs across the state. This includes face-to-face training, webinars, and electronic tutorials.
- DHHS has identified an internal resource (one FTE) to serve as Training Coordinator for a statewide ME training program. This position will develop, coordinate, evaluate and track compliance with training requirements.
- OCME has engaged its regional autopsy center partners in planning for consistent mandatory orientation and training. A statewide uniform training plan is being developed. Training will be developed for delivery as a combination of face-to-face and on-line products. Training opportunities will be available locally and regionally to assure easy access and minimal cost to new medical examiners. Training will also build on the existing medicolegal seminars currently delivered by ECU and WFU staff and will also revive an annual training seminar previously provided by the OCME.

Findings:

- Well trained local medical examiners are the cornerstone of any statewide ME system.
- The North Carolina ME system currently has no structured program of formal training for medical examiners.
- Given the variability in education and experience in the types of individuals eligible to be appointed as MEs in North Carolina, mandatory ME orientation and ongoing training are vital to ensure consistent and uniform death investigations across the state.
- If funds are identified to fully support training efforts, it is recommended that General Statute 130A-382 be rewritten to require:
 - Newly appointed MEs to attend mandatory orientation within 90 days of appointment and to maintain continuing education annually as directed by the OCME. The effective date of the mandatory training requirement should be at least six months after initiation of the \$100,000 appropriation.
 - Existing ME appointees to attend mandatory orientation within 12 months following funds appropriation and to maintain continuing education annually as directed by the OCME.

Initial funds secured in the approved \$1 million expansion request for the OCME SFY 2014–15 will partially support the development and implementation of the training program.

\$100,000 was previously requested for this effort as part of the additional \$1 million included in the Governor's Expansion Request for SFY 2014–15 for the OCME (was not included in the final budget enacted). These recurring funds are needed to fully implement the ME orientation and training program.

Mid-Term

- (1) *Evaluate the use of Medicolegal Death Investigators (MDIs) for the North Carolina medical examiner system, in addition to maintaining the existing system using appointed MEs.*
- (2) *Develop a strategy of state-local funding to provide 0.5 MDI FTEs per 100,000 population in our state (national recommendation).*

DHHS Actions:

- Is currently investigating and developing the roles and responsibilities for the MDI position in our state. This process includes: (1) defining education and training requirements for MDIs consistent with guidelines from the American Board of Medical Death Investigators (ABMDI); and (2) establishing clear accountability for monitoring of work performance of MDIs.

Findings:

- There is a public expectation that medical examiners go to death scenes to initiate their investigations. This has not proven feasible in a voluntary medical examiner system and has never been required in North Carolina.
- The quality of death scene investigations therefore varies across the state.
- NAME accreditation standards, however, do not require a visit to the death scene for every ME case.
- The 2001 Medical Examiner Study Group recommended that North Carolina establish the position of MDI for the North Carolina medical examiner system. The MDI is a non-physician, but medically-knowledgeable resource who is trained in investigative techniques and works under an appointed medical examiner.
 - There are no nationally recommended minimum education standards for MDIs. States are encouraged to establish minimum requirements, and the OCME would set a minimum standard of at least an associate's degree in a medically-related or appropriate field of study.
 - ABMDI provides training and a certification program for MDIs, and this would also serve as a mandatory requirement for the MDI role in North Carolina.
- The American Academy of Forensic Science (AAFS) recommends 0.5 MDI Full Time Equivalents (FTEs) per 100,000 population. For North Carolina's population of over 9.85 million, approximately 50 MDIs would be needed to meet AAFS' recommended coverage area.
- The existing ME system in North Carolina cannot be completely dismantled in favor of a Medicolegal Death Investigator only system. If MDIs are to be considered in our state's ME system, it seems prudent to establish the role in the existing regional ME system (a hybrid system) with a phase in period..

If the General Assembly chooses to consider establishing the role of MDI in a statewide fashion, using a cost of \$57,000 (salary and fringes) per MDI, approximately \$2.85 million would be required to fund the personnel costs only for full statewide coverage of MDI services at the nationally recommended guidelines. **This estimate does not include operational support such as supplies and transportation.**

Recommendations to support existing statewide autopsy services

Short Term

- (1) **Fully support the three existing regional autopsy centers by reimbursing them for their actual current costs to perform autopsies.** Regional autopsy costs are currently funded by both state funds (through OCME's contracts with ECU, WFU, and Mecklenburg County ME Office) and county funds (through the current statutory autopsy fee of \$1,250/case).

DHHS Actions:

- As part of contract negotiations with the three regional autopsy centers for SFY 2014–15, solicited from the three regional centers their full costs for completing an autopsy (including indirect costs and overhead). They reported the following:

Center	Total cost per autopsy (includes indirect costs and all overhead)
East Carolina University	\$3,579
Wake Forest University	\$2,630
Mecklenburg County ME Office	\$2,816

- Completed a cost study of the OCME's autopsy costs. Based on a cost study completed by the DHHS Controller's Office in September 2014, the OCME's cost per autopsy is \$2,813. This excludes the OCME's costs for centralized ME system functions such as the MEIS, transportation and toxicology services.

Findings:

- Given the scarcity of board-certified forensic pathologists, a regional approach for delivering medicolegal autopsy services has developed in North Carolina. A national publication in 2013 by the Scientific Working Group for Medicolegal Death Investigation (SWGMDI) recommends the use of regional autopsy and death investigation facilities to counter the national shortage of board-certified forensic pathologists. As there is no indication there will be increased availability of these personnel in the future, continuing a regional approach to autopsy services in North Carolina seems warranted. Support for the existing three regional centers (through reimbursement for their actual costs) will be required to continue a regional autopsy system in our state.
- Autopsy fees have not kept pace with inflation and have not been increased to account for increases in basic operating expenses such as disposable supplies, utilities, and scientific supplies and equipment, as well as salaries for board-certified forensic pathologists, for which there is a low supply and high demand nationwide.
- The state currently supplements (through contracts) the three existing regional autopsy centers by \$400 per autopsy.
- Combined with the statutory fee of \$1,250/case these centers receive from counties for autopsy payments, these funds total \$1,650/autopsy and do not meet the self-reported costs for an autopsy for the three centers (which includes their indirect costs and overhead). Self-reported costs (required for their current SFY 2014–15 contracts) are listed in the table above.
- As previously noted, the missions of both ECU and WFU are not intricately tied to the mission of the OCME. Both organizations have reported they are unlikely to continue to provide autopsy services if they are unable to be reimbursed for their costs.
- If the General Assembly chooses to fully reimburse regional centers for the actual cost of an autopsy, the Mecklenburg County ME Office's self-reported costs appear to be a good representation of actual costs for completing autopsies in a regional center, since the Mecklenburg County ME Office solely functions to complete autopsies and related activities.

- Like the ME fee, any offset or reduction in current OCME funding relative to a proposed autopsy fee increase will not improve the operational budget for the OCME and will not move the ME system forward. General Statutes direct the OCME to pay autopsy fees to providers of these services when a death or fatal injury occurs outside the decedent's county of residence. These payments for "out of county" deaths account for approximately 10 percent of the total annual autopsy payments in the state.
- (2) ***Support additional forensic pathology fellowship positions (approximately \$250,000 recurring annually) at both WFU and ECU*** to create a ready supply of trained forensic pathologists to support the OCME and regional autopsy centers. Fellowship programs are a vital part of succession planning for a statewide ME system.

DHHS Actions:

- Provided an internal resource (one FTE) to fund a board-certified forensic pathology fellow at the OCME for SFY 2015–16. DHHS does not have the resources to fund similar positions at both WFU and ECU.

Findings:

- There are less than 500 practicing full time board-certified forensic pathologists in the nation and competition for their services is fierce.
- Forensic pathology fellows programs are a nationally-recognized route to build stability and capacity in a statewide medical examiner system and to create a deeper workforce and workforce sustainability.
- Fellows often take positions in the state where they train. In fact, they often choose a fellowship in an area where they are interested in working after training. Fellows also perform autopsies which generate receipts well in excess of their salary and benefits. Therefore, investments in fellowships bring long-term and short-term benefits.

Funding to support this function was recommended in the Governor's proposed budget for SFY 2014–15 but was not included in the final budget enacted.

A summary of estimated costs for all recommendations is provided in the table on the next page.

**Summary of OCME Improvements and DHHS Recommendations (with preliminary cost estimates where applicable)
September 27, 2014**

	R	Amount	NR
Recent			
1 2014-15 Budget: Provided funding to address operational issues in the statewide medical examiner system. The expansion increased the FY 2014-15 budget by 23% from \$4.4 million to \$5.4 million.		1,000,000	-
2 2013-14 Budget: Increased autopsy fee from \$1,000 to \$1,250.		-	-
3 2012-13 Budget: Provided funds for new positions and operating costs for the new Chief Medical Examiner's Office.		334,806	-
Recent Subtotal		1,334,806	-
Planned			
4 2014-15 Fiscal Year: Will use existing vacancies within DHHS to place 10 positions within OCME (and 1 additional position in SFY 15-16).		1,050,000	-
Planned Subtotal		1,050,000	-

Short-Term			
5 Upgrade the Medical Examiner Information System (MEIS) to meet national accreditation standards, to better support real-time field ME investigations and reporting, to improve data analysis for trends in cause of death, and for overall reporting and billing functions. Estimate is \$1,655,000 (NR) for upgrade with optional \$540,000 (NR) for mobile devices for appointed medical examiners.	20,000	2,195,000	
6 Mandate and fund medical examiner orientation and training.	100,000	-	
7 Increase the statutory medical examiner fee from \$100/case to \$250/case. Represents the annual increased cost to the OCME for payment of ME fees for "out of county" deaths. Preliminary estimate is based on 6-year (calendar year) annual average cost of ME cases, as extracted from the MEIS; assumes no change in statutory requirements for payment responsibility for ME fees.	255,502	-	
8 Support additional forensic pathology fellowship positions at WFU and ECU.	250,000	-	
9 Make inflationary adjustments to account for new transportation rates expected with Request for Proposals for new transportation agreements. Cost is undetermined (SFY 2014-15 expansion included transportation funding).	TBD	-	
10 Reimburse 3 existing regional autopsy centers closer to their costs to perform autopsies, regardless of source of funding to support. State appropriation need is unquantified at this point. As an example, if the General Assembly chooses to increase the fee to \$2,800/autopsy, preliminary estimate is an increased annual cost of \$5,899,248 in total combined system autopsy costs (includes estimated \$563,965 increase in OCME costs to pay for "out of county" deaths; based on 6-year average of calendar year autopsy costs across the state, as extracted from the existing MEIS; assumes no statutory change in autopsy payment responsibility).	TBD	-	
Short-Term Subtotal	625,502	2,195,000	
Mid-Term			
11 Build two new regional autopsy centers (eastern NC and western NC). Estimate = \$12,383,000/facility x 2 = Total of \$24,766,000 (NR). One-time cost of equipment for single free-standing state owned facility \$650,000 x 2 facilities = \$1,300,000 (NR). Build state-owned construction to replace ECU and WFU facilities. Estimate = \$12,383,000 (WFU) + \$11,526,000 (ECU) = Total of \$23,909,000 (NR). One-time cost of Mecklenburg ME Office upgrade of \$750,000 (NR). Recurring annual operational costs for 2 new facilities - estimate \$705,000 Personnel (salary & fringes, 8 FTEs) and \$474,955 Operations & Maintenance. Total of \$1,179,955/facility x 2 facilities = \$2,359,910 (R).	2,359,910	50,725,000	
12 Develop a strategy of state-local funding to provide 0.5 Medicolegal Death Investigators (MDIs) per 100,000 population in the state. If the General Assembly chooses to consider establishing the role of MDI in a statewide fashion, using a cost of \$57,000 (salary and fringes) per MDI, approximately \$2,850,000 would be required to fund the personnel costs only for full statewide coverage of MDI services at the nationally recommended guidelines. This would not include operational support such as supplies and transportation for these MDIs.	2,850,000	-	
Mid-Term Subtotal	5,209,910	50,725,000	
Total of DHHS Recommendations	5,835,412	52,920,000	

DHHS Recommendations

Resources

National Academies Press. *Medicolegal Death Investigation System: Workshop Summary*. 2003.

National Association of Medical Examiners. *State ME Salary Survey*. 2001. NAME. Marceline, MO.

Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2013. U.S. Census Bureau, Population Division.

Scientific Working Group for Medicolegal Death Investigation. *Regional Medicolegal Autopsy and Death Investigation Centers — Construction, Staffing, and Costs*. 2013. SWGMDI.

National Association of Medical Examiners. *Standards for Inspection and Accreditation of a Modern Medicolegal Investigative System*. NAME. Marceline, MO. 1988.

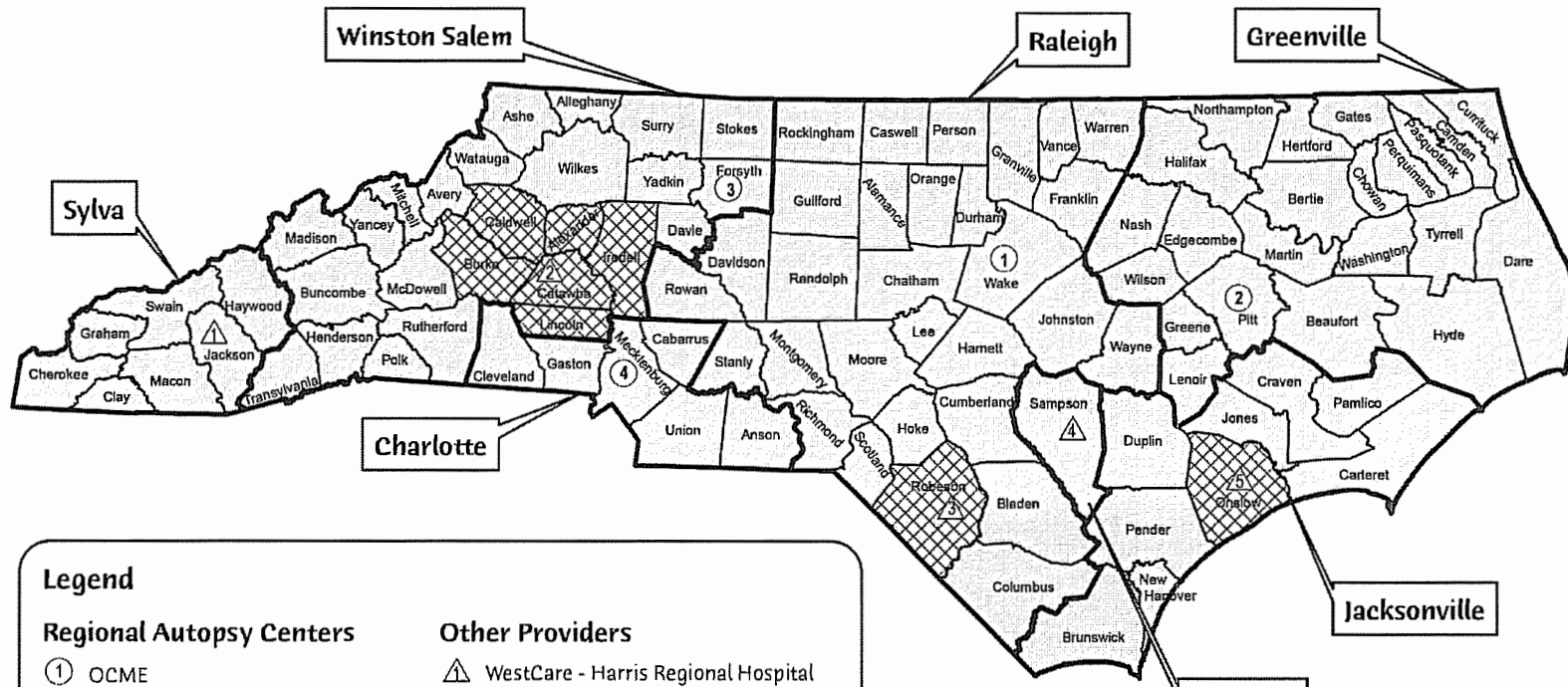
Scientific Working Group on Medicolegal Death Investigation. *State Medical Examiner Survey*. January 2012.

National Association of Medical Examiners. *Survey#31: Body Transport Costs*. NAME. Marceline, MO. 2012.

Appendices

Appendix 1
North Carolina Office of the Chief Medical Examiner Regional Coverage Map

North Carolina Office of the Chief Medical Examiner Regional Autopsy Center Catchment Areas



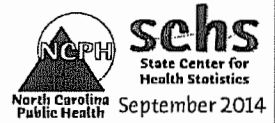
Legend

Regional Autopsy Centers

- ① OCME
- ② East Carolina University
- ③ Wake Forest University
- ④ Mecklenburg Medical Examiner
- ⊗ Service Overlaps with Other Centers
- ~ OCME Regions
- ~ County Boundary

Other Providers

- △ WestCare - Harris Regional Hospital
- △ Piedmont Pathology Group
- △ Southeastern Regional Medical Center
- △ Sampson Regional Medical Center
- △ Onslow Memorial Hospital



Appendix 2

Definition of Terms Used in Describing the North Carolina Medical Examiner System

There is no standardized death investigation system in the United States. Therefore, different jurisdictions may use the same terms to refer to different positions. When attempting to compare systems, the first step must be to define the positions about which one is concerned. The following definitions are those that are used in North Carolina.

Medical Examiner

The medical examiner is a county-level position. This is the official who, when contacted about a death, makes the decision as to whether the case falls under medical examiner jurisdiction. If it does, the medical examiner takes charge of the body, makes inquiries regarding the cause and manner of death, reduces the findings to writing, files this report with the Office of the Chief Medical Examiner and completes a death certificate. This is a three-year appointment made by the Chief Medical Examiner. The Chief Medical Examiner shall give preference to physicians licensed to practice medicine. These physicians are not usually specialists in pathology or forensic pathology. All forensic pathologists are also medical examiners in North Carolina. The Chief Medical Examiner may also appoint licensed physician assistants, nurse practitioners, nurses, coroners or emergency medical technician-paramedics. The medical examiner usually is not required to be a specialist in death investigation or pathology.

Coroner

The coroner is a county-level elected official whose duty is to make inquiry into deaths in certain categories. Because North Carolina has a state-wide medical examiner system, only a medical examiner, and not a coroner (unless that coroner is also an appointed medical examiner) can legally certify a death.

Death Investigator

The role of the medicolegal death investigator is to investigate any death that falls under the jurisdiction of the medical examiner, including all suspicious, violent, unexplained and unexpected deaths. The medicolegal death investigator is responsible for the dead person, whereas the local law enforcement jurisdiction is responsible for the scene. The medicolegal death investigator performs scene investigations emphasizing information developed from the decedent and determines the extent to which further investigation is necessary. There are no formal requirements to become a medicolegal death investigator. A medicolegal death investigator must be the most medically knowledgeable person at the scene of the crime to determine if further investigation is necessary. There are no formal educational requirements specifically for medicolegal death investigation. Any degree program dealing with Forensic Science, Natural science, Anthropology, Nursing, or any other medically related field would be useful. There are several established training courses available throughout the country that teach the basic information needed in order to perform a thorough, competent medicolegal death investigation.

Pathologist

A pathologist is a physician trained in the medical specialty of pathology. Pathology is the branch of medicine that deals with the diagnosis of disease and causes of death by means of laboratory examination of body fluids (clinical pathology) cell samples, (cytology) and tissues (anatomic pathology). The autopsy is the procedure utilized to study the dead. It is primarily a systematic external and internal examination for the purposes of diagnosing disease and determining the presence or absence of injury. In North Carolina, there are some hospital-based pathologists who perform medicolegal autopsies with an agreement with the Office of the Chief Medical Examiner (OCME).

Forensic Pathologist

The forensic pathologist is a subspecialist in pathology whose area of special competence is the examination of persons who die suddenly, unexpectedly or violently. The forensic pathologist is an expert in determining cause and manner of death. The forensic pathologist is specially trained to: perform autopsies to determine the presence or absence of disease, injury or poisoning; evaluate historical and law-enforcement investigative information relating to manner of death; collect medical evidence, such as trace evidence and secretions; document sexual assault; and reconstruct how a person received injuries. Forensic pathologists are trained in multiple forensic sciences as well as traditional medicine. Other areas of science of which the forensic pathologist must have a working knowledge include toxicology, firearms examination (wound ballistics), trace evidence, forensic serology and DNA technology. The forensic pathologist acts as the case coordinator for the medical and forensic scientific assessment of a given death, making sure that the appropriate procedures and evidence collection techniques are applied to the body. When forensic pathologists are employed as death investigators they bring their expertise to bear upon the interpretation of the scene of death, in the assessment of the time of death, of the consistency of witnesses' statements with injuries, and the interpretation of injury patterns or patterned injuries. In jurisdictions where there are medical examiner systems, forensic pathologists are usually employed to perform autopsies to determine cause and manner of death. In North Carolina, board-certified forensic pathologists are employed in one of four regional centers to perform medicolegal autopsies for the many counties in their respective regions. They may be called **Regional Pathologists**.

Regional Center

This is the physical location where medicolegal autopsies are performed by board-certified forensic pathologists. Currently, in North Carolina there are four Regional Centers: OCME in Raleigh, Mecklenburg County ME Office in Charlotte, Wake Forest University (WFU) Baptist Hospital in Winston-Salem and East Carolina University (ECU) Brody School of Medical in Greenville.

Appendix 3

Key Metrics — Statewide Medical Examiner (ME) Systems

(Data accessed as of August 2013, unless otherwise indicated, via state websites or self-report)

	North Carolina	Virginia	West Virginia	Maryland	New Mexico
Population *	9,535,483	8,001,024	1,852,994	5,773,553	2,059,179
NAME Accredited	No	Yes	No	Yes	Yes
Annual Deaths (3 year average)	78,411	59,181	21,385	43,556	15,834
Annual ME cases **	10,850 (3 year average) 13.8% of total deaths	5,670 9.6% of total deaths	4,500 2.0% of total deaths	8,000 18.4% of total deaths	5,500 34.7% of total deaths
Annual Autopsies **	3,947 (3 year average) 5.0% of total deaths	3,026 5.1% of total deaths	1,600 7.5% of total deaths	4,000 9.2% of total deaths	2,100 13.3% of total deaths
Number Forensic Pathologists	4 central office; 9 in regional centers (3 each)	14	6 in central office; 2 in satellite office (WVU)	14	8 (9 effective July 2013)
Autopsy Rate/Forensic Pathologists	303	216	200	285	241
Criteria for Autopsy	Yes; http://www.ocme.dhhs.nc.gov/rules/guidelines/shtml	Yes; "professionally established guidelines" (NAME 2013 Guidelines)	No specific WV criteria; follow NAME Guidelines	Yes	Yes
Local Medical Examiner Training Program	Annual conference prior to 2012 (pay to attend)	Local Medical Examiner Training; annual statewide training (funded by state)	Annual course (pay to attend)	Provided by State	Office of Medical Investigation (ME) trains all Field Deputy Medical Investigators (funded by state)

	North Carolina	Virginia (VA)	West Virginia (WV)	Maryland	New Mexico
Local MEs Connected to Statewide ME Database	OCME and 2 regional centers have direct access; local MEs and other pathologists send to OCME who enters into database	Virginia Medical Examiner Data System connects regional offices, not clear if all 210 local MEs can enter data	No; county MEs fax reports to investigators who enter into database	No, secondary to security issues; new system pending	Indirectly; field investigators use separate system; this data is transferred to central office and uploaded by staff after quality assurance is performed
Where are Autopsies Conducted	Central office; 3 designated regional centers; 6 additional sites (hospital)	Regionalized state system with 4 sites	Central office and at satellite site at West Virginia University	Only one central office (built to accommodate workload)	Only one central office (built to accommodate workload)
Autopsy Fee Amount	\$1,250	None	None	None	None
Autopsy Fee Payment Responsibility	County for county residents; state for non-residents of county of death	State budget	State budget	State budget	State budget
Average Transportation Costs per body	\$90 for 1st 40 miles; \$1.00/mile > 40 miles; Round trip	\$100/1st 25 miles and \$1.50/mile >25 miles; paid for one-way trip to facility	\$2.25/mile or flat \$75 if local	\$3.30 mile	\$2.00/loaded mile 1st decedent; \$1.00/loaded mile 2nd decedent; Minimum payment of \$75 for Bernalillo Co. cases (local to central office)
Transportation Cost Responsibility (county or state)	State appropriations	State appropriations	State appropriations (WV statute)	State appropriations	State pays the initial transport; families pay to have decedent returned
Toxicology	Centralized at OCME for entire state	Centralized for entire state in VA Department of Forensic Science (separate agency)	Centralized for entire state	Centralized at OCME for entire state/ABFT Accredited	Referred to outside labs accredited by the American Board of Forensic Toxicology (ABFT)

	North Carolina	Virginia (VA)	West Virginia (WV)	Maryland	New Mexico
Toxicology Costs	Funded by state	Funded by state and budgeted in VA Dept. of Forensic Science	Funded by state and some receipts/grants	Funded by state	Funded by state approx.\$200,000/year for contract (70%); State Laboratory of Public Health (SLPH) toxicology lab conducts 30% of testing and those funds are in SLPH budget
State Funding for ME System	SFY 2013-14 appropriations of \$4,394,503, or \$0.46/capita ***	Appropriations of \$9,428,641 or \$1.18/capita	Appropriations of approximately \$5M or \$2.70/capita	Appropriations of approximately \$10.4M or \$1.80/capita	Appropriations of approximately \$4.8M or \$2.33/capita

* 2013 census estimates as of August 27, 2013.

** The following information from the National Vital Statistics System, Mortality, No. 67, August 2011 describes national trends in deaths and autopsies.

- The percentage of deaths for which an autopsy was performed declined more than 50 percent from 1972 through 2007, from 19.3 percent to 8.5 percent. During the same time period, North Carolina had a 6.7 percent autopsy rate.
- External causes accounted for nine of the 10 most frequently autopsied causes of death.
- The percentage of deaths autopsied declined with age after ages 15–24: from 60 percent at ages 15–24, to 11 percent at ages 55–64, to less than 5 percent at ages 65–74.
- In 1972, 79 percent of autopsies were performed for deaths due to disease conditions and 19 percent if autopsies were performed for deaths due to external causes. By 2007, the respective percentages were 46 percent and 50 percent.
- While the age distribution of deaths shifted to older ages from 1972 through 2007, autopsied deaths were increasingly concentrated in the age groups 1–34 and 35–64.

*** Uses SFY 2013–14 certified budget. \$1 million in state expansion funds were received for SFY 2014–15; total state appropriations SFY 2014–15 = \$5,394,503.

Using August 2014 OSBM website’s provisional census data of 9,861,952 yields state funding of \$0.547/capita for SFY 2014–15.

Per capita calculation uses North Carolina state appropriations only for the purposes of comparison to other states’ investments of state appropriations. Excludes North Carolina county investments of approximately \$3,854,650/year using a six year (calendar year 2008–2013) average of costs paid by counties for ME investigations and autopsies. This total annual county payment equals approximately \$824,352/year for ME investigation payments, and approximately \$3,030,298/year for autopsy payments. Applied against the current population of 9,861,952 (August 2014 provisional census data), North Carolina will invest approximately \$0.938 per capita using combined state and local funds.

Appendix 4. Autopsies Completed in State Fiscal Year 2012–2013

Location/Practice	# Autopsies Completed in SFY 2012–13
Office of the Chief Medical Examiner	1,254
ECU Brody School of Medicine	537
Wake Forest University	692
Mecklenburg Medical Examiner Office	586
Onslow Memorial Hospital*	337 **
Piedmont Pathology Associates*	108
Harris Regional Hospital*	106
Watauga Hospital*	98
Sampson Regional*	34
Southeastern Regional Med. Center*	39
Rex Hospital *	5
UNC Hospital *	7
TOTALS	3,803

* These facilities have non board-certified Forensic Pathologists

** For SFY 2014–15, Onslow Memorial will divert certain homicide cases to ECU

Appendix 5

Prerequisites for N.C. Office of the Chief Medical Examiner (OCME) Application for National Association of Medical Examiners (NAME) Accreditation

Prerequisites Based on Published NAME Standards	DHHS Actions and Remaining Needs to Fulfill Accreditation Prerequisites
<ul style="list-style-type: none"> Ability to prepare an annual report tabulating total cases report, accepted, examined, and autopsied, and the major causes of death sorted by each manner of death category. Includes 16 specific data points in the NAME checklist. (Note: Mere availability of data from a computerized information management system does not satisfy this checklist item. A major rationale for the compilation of such data is the value they provided for analyzing and understanding the workload and short and long term trends that may affect an office. A deficiency is noted for each missing report of those noted in the checklist). 	<ul style="list-style-type: none"> Internal DHHS resource (one Full Time Equivalent or FTE) has been located to support Epidemiologist position to mine and analyze data and create expected and required reports. Updated, fully functional Medical Examiner Information System (MEIS) with sufficient Information Technology (IT) personnel resources are needed. Requires MEIS system and technology upgrades. Internal DHHS resources (2 FTEs) have been identified for IT position resources. All regional centers must be interfaced with and supply data via the MEIS.
<ul style="list-style-type: none"> Medical staff of sufficient size that no autopsy physician is required to perform more than 250 autopsies a year (includes formula for performing autopsies, external examinations and other administrative duties (e.g., case reviews, training). Is there sufficient technical staff coverage to handle the routine daily caseload for autopsy assistance? Are 90 percent of reports of all postmortem examinations completed within 90 calendar days from the time of autopsy? Are all physicians ultimately responsible for autopsies pathologists who are board certified in anatomic pathology by the American Board of Pathology and who have completed at least one year of supervised training under the supervision of a forensic pathology certified by the American Board of Pathology, or are they themselves so certified? 	<p>Internal DHHS resources have been located to fill position resources that are needed to meet standards:</p> <ul style="list-style-type: none"> Forensic pathologist to right-size autopsy workload and to improve case completion requirements * Autopsy technician to support forensic pathologist Forensic Pathology Fellow position (can perform autopsies) <p>Regional autopsy centers will need to be expanded (including personnel resources to meet standards) and two additional regional autopsy centers are needed to ensure autopsies are completed only by board-certified forensic pathologists.</p> <p><i>*7/23/14 — tracking for approximate average annualized caseload of 270 cases per Forensic Pathologist</i></p>
<ul style="list-style-type: none"> Are 90 percent of toxicology examinations completed within 90 calendar days of case submission? 	<p>DHHS internal resources (2 FTEs) have been identified to meet the standard:</p> <ul style="list-style-type: none"> Chemist III (Toxicologist) — to review results for expedited release Chemist II — improve testing throughput and turnaround
<ul style="list-style-type: none"> Does the office have a primary person designated to release or oversee the release of public information? 	<p>A DHHS internal resource (one FTE) has been identified to meet this standard [Paralegal III or Attorney I/II (preferred)]</p>
<ul style="list-style-type: none"> Are there written and implemented qualifications established for medical investigators (examiners)? Have medical investigators (examiners) received specific training in the policies and procedures of the office? Is there continuing education available for all medical investigators? 	<p>DHHS internal resource (one FTE) has been identified to meet the standard:</p> <ul style="list-style-type: none"> A Public Health Program Consultant II will serve as Training Coordinator for the statewide ME system to develop and deliver orientation and training packages for all new medical examiners, including seminars/conferences, webinars, and hands-on practical training; and to develop method and monitor/track training all medical examiners in North Carolina
<ul style="list-style-type: none"> Is there sufficient non-technical staff coverage to handle the routine daily caseload for administration and for records keeping? 	<p>A DHHS internal resource has been identified (one FTE — Processing Assistant V) to meet this standard.</p>

OCME submitted application for American Board of Forensic Toxicology (ABFT) accreditation June 30, 2014; on-site inspection expected in early 2015.

Appendix 6

Planning Session — Strengthening the Statewide Medical Examiner System in North Carolina August 28, 2013

On August 28, 2013, at the invitation of North Carolina Department of Health and Human Services (DHHS) Secretary Aldona Wos, the following partners convened to discuss critical planning for strengthening the statewide medical examiner (ME) system in North Carolina.

Aldona Wos, MD, Secretary, N.C. Dept. of Health and Human Services (N.C. DHHS)

Mark Payne, Chief of Staff, N.C. DHHS

Robin Cummings, MD, Deputy Secretary for Health Services and Acting State Health Director, N.C. DHHS

Bill Furney, representing DHHS Public Affairs Office

William (Bill) Oliver, MD, East Carolina University (ECU) Department of Pathology

Peter Kragel, MD, Chairman, ECU Department of Pathology

Patrick Lantz, MD, Wake Forest University (WFU) Department of Pathology

Meghan Shapiro, WFU Department of Pathology

Michael Sullivan, MD, Chief, Mecklenburg County Medical Examiner's Office

Thomas Owens, MD, Mecklenburg County Medical Examiner's Office

Christopher Gullede, MD, Mecklenburg County Medical Examiner's Office

Danny Staley, Acting Division Director, N.C. Division of Public Health (N.C. DPH)

Chris Hoke, JD, Chief, Office of Legal & Regulatory Affairs, N.C. DPH

Allen Hawks, Director, Business Operations, N.C. DPH

Megan Davies, MD, State Epidemiologist and Chief, Epidemiology Section, N.C. DPH

Deborah Radisch, MD, MPH, Chief Medical Examiner, Office of the Chief Medical Examiner (OCME)

Clay Nichols, MD, Deputy Chief Medical Examiner, OCME

Lou Turner, DrPH, MPH, Deputy Chief, Epidemiology Section, N.C. DPH

Mabel Bullock, JD, Special Deputy Attorney General, N.C. Department of Justice (N.C. DOJ)

Gina Cucurullo, JD, N.C. DOJ

John Barkley, JD, Attorney General's Office, N.C. DOJ

The group's discussions followed an outline using the following key system-wide topics and considering a tiered approach to implementing improvements:

1. Regional forensic centers
2. Recruitment of local MEs
3. Training of MEs
4. ME data system and public access to information
5. Strengthening statutory authority
6. System infrastructure (including looking at cost savings/sharing in body transportation, toxicology and considering charging fees for certain services)
7. Enhancement of the quality of medical death scene investigations