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President’s Message
Kaye M. Reynolds, MPH

It is indeed a humbling experience to become the President of a statewide association as diverse and yet cohesive as is the Texas Public Health Association. At the 2012 Annual Education Conference in Arlington, I was struck by the many and varied topics presented and discussed, while realizing that these were only some of the challenges and ongoing efforts of public health in its many faces across the state.

At the same time, it is exciting and encouraging to realize the breadth and strength of the public health workforce and the public health system that is ready to meet these challenges.

At the conference, we heard about the public health response to the Bastrop wild fires, surveillance for vaccine preventable and infectious diseases, research and best practices related to our aging population, community nursing, health disparities, cancer. We were enlightened and challenged by plenary speeches regarding health policy and health funding. In order to continue to improve the health of all Texans, we must continue to grow the public health workforce and the public health system in our state. To do this, we must also continue the partnerships we now have and continue to reach out to other potential partners. We are very fortunate to have strong schools of public health within the state which are on the cutting edge of research as well as training the next generation of public health workers. Other groups such as the Texas Association of Local Health Officials and the Community Health Coalition are key partners in our efforts in advocacy and training.

There are two opportunities facing public health currently in which we as public health professionals can add our expertise. The first is the The Texas Health-care Transformation and Quality Improvement Program, otherwise known as the Medicaid 1115 Waiver. Some of us are involved as direct providers of care, but there is a need for program planning, evaluation, visioning, community education, data gathering, training, sharing of best practices and many other skills that the public health professional is uniquely skilled to offer.

The second opportunity is public health department accreditation. The voluntary national accreditation program is underway and many health departments in Texas are looking into the process. We have a range from those who participated in the beta testing of the program to those who are wondering why or how they should be involved. Accreditation will not make all health departments look the same, we are too varied in size, funding and mission for that. It will give us the opportunity to measure the activities that we are involved in against a set of standards, based in the ten essential public health services. We will have the opportunity to show that we are performing in such a way as to ensure the best delivery of public health practice possible. Your Texas Public Health Association, in partnership with other organizations, such as the Texas Association of Local Health Officials, will be hosting a conference on September 24th and 25th, in Austin, to provide local health departments, and our public health partners, an opportunity to gain hands on skill training in the prerequisites of accreditation, the Community Health Assessment, the Community Health Improvement Plan and the agency Strategic Plan. This conference is partially supported by a grant that TPHA received from APHA to support accreditation efforts. I hope to see many of you in Austin in September.

Editorial Note: In addition to the public health research and practice original articles, poison control and historical columns, this issue includes several feature articles each with an introductory note. Stay healthy!
Commissioner’s Comments

David L. Lakey, M.D.
Commissioner, Texas Department of State Health Services

Dr. Lakey’s column will resume in the Fall. Stay up-to-date on the latest public health information at http://www.dshs.state.tx.us/default.shtm

Surviving Disaster: How Texans Prepare
http://www.texasprepares.org/survivingdisaster.htm

Ready or Not
http://www.texasprepares.org/

Texas Women’s Health
http://www.texaswomenshealth.org/

Save the Date

TPHA Annual Education Conference
¡Viva! Public Health
March 20-22, 2013
The St. Anthony Riverwalk
San Antonio, Texas
Missing a piece of the Accreditation puzzle?

Participate in hands-on, interactive activities to find out more about collecting, analyzing, and reporting data to share with community partners. Practice tips for engaging community partners while keeping your agency’s goals in the forefront.

Save the Date

Local Health Department Accreditation Skill Building Conference

September 24-25, 2012

University of Texas Commons Learning Center, 10100 Burnet Rd

Austin, Texas, 78758

Sponsored by: Texas Public Health Association, Texas Association of Local Health Officials, University of North Texas School of Public Health, Texas Public Health Training Center.

Funded in part by a grant from the American Public Health Association.
Adoption of Information Technology In Texas Nursing Homes

Rick Nauert PT, MHF, MHA, PhD, Tina Fields, PhD, MPH
School of Health Administration, Texas State University

Background: Use of health information technology (HIT) to improve care for long-term care (LTC) residents is a prerequisite for obtaining a high-performing health care system. Although LTC was not included in recent legislation to reward use of HIT, health reform calls for patient-focused, coordinated care delivery that will necessitate use of HIT and electronic health records (EHRs) in LTC facilities.

Methods: Approximately 34% of the 1170 Texas LTC facilities responded to a survey on the use of HIT for 12 clinical functionalities and 9 administrative/quality enhancement tasks. Findings were analyzed to determine difference in use among ownership segments, and Texas HIT utilization was compared to prior national and state surveys. Ultimately findings were placed in stage-based EMR adoption models. Results: The absence of a consistent terminology and the rapid evolution of HIT limited valid comparisons with earlier HIT assessments. Comparisons among ownership sectors showed that profit-based homes were significantly advanced in their use of HIT/EMRs for numerous factors. Texas LTC facilities used EMR/HIT functionalities on the same level (Stage 3 of 7) as the majority of national and rural hospitals, although some hospitals had progressed to mature stages of EMR.

Conclusion: Texas LTC facilities are using health information technology to perform various clinical and administrative functions. In a majority of cases, current use of HIT in LTC is comparable to early adoption patterns in hospitals. However, in response to federal initiatives, hospitals are accelerating toward sophisticated use of EMR functionalities. This trend may create a digital divide between LTC facilities and hospitals/physicians. Our findings suggest that Texas non-profit facilities may be challenged to stay abreast of HIT advances associated with health care reform.

INTRODUCTION
Health information technology (HIT) pertains to the use of information systems for administration, operations management, and direct clinical functions. Health reform embraces HIT as a critical tool to coalesce the fragmented U.S. health care sector. Policymakers believe the ability to leverage electronic communication will improve the quality, safety and efficiency of care to Medicaid and Medicare clients. The American Recovery and Reinvestment Act (ARRA) of Health Information Technology for Economic and Clinical Health Act (HITECH) reward hospitals and clinical practitioners for use of Electronic Medical Records (EMRs). The law also threatens to penalize hospitals and providers if they do not use EMRs for Medicare and Medicaid patients. This legislation has become necessary as HIT advancement has been slow to develop in the United States. Although the ultimate goal of HITECH is to create a virtual network of all health care providers, long term care (LTC) facilities were not included in the legislation. Knowledge of current HIT use in LTC is important as policymakers address technology use in LTC – an environment with significant federal health care expenditures and a setting that will expand as the population ages. While use of HIT is expected to expand, there is a lack of literature addressing the current use of HIT in LTC. The present study seeks to determine the current status of HIT adoption in Texas LTC, establishing a baseline to monitor future utilization patterns. A key element of the current study is the comparison of HIT utilization between non-profit and profit-based facilities.

Historically, LTC facilities have trailed other health care settings in use of HIT. However, for over a decade LTC facilities have electronically submitted claims and a minimum data set (MDS) of standardized clinical assessment data on their residents. The MDS transmittal is in accordance with the Omnibus Budget Reconciliation Act (OBRA) of 1987, the Resident Assessment Instrument, and other aspects of nursing home reforms. This use of HIT to report quality metrics in LTC has led to both over- and underestimates of information systems adoption and capability. A lack of consistent descriptive terminology and nomenclature associated with HIT has undermined accurate determination of HIT adoption, especially as related to clinical aspects of care. Our literature review of the 2004 National Nursing Home Survey state surveys of California, New York and Minnesota, and the federally commissioned 2009 Literature Review and Synthesis of Existing Surveys on Health Information Technology in Nursing Homes and Home Health demonstrated inconsistency in survey formats and taxonomy. The California survey was qualitative in nature while the state and national studies were limited on detail confounding an accurate longitudinal comparison of HIT utilization.

In an effort to improve content validity, we incorporated the recommendations of Kramer et al. to ensure that our survey would include core HIT functionalities that support patient safety, improve provider communication and enhance clinical effectiveness and efficiency. Assessment of core functionalities included queries on use of HIT to perform assessment and care planning, document clinical notes, retrieve lab orders and results, and perform quality management and reporting. To improve construct and face validity, the authors shared the survey with nursing home administrators, directors of nursing, chief information officers and industry experts who had developed prior nursing home HIT surveys.

METHOD
A gold standard assessment tool to examine LTC facilities’ use of HIT/EHR for administrative, clinical and quality improvement tasks did not exist. Our survey tool was developed to improve assessment of HIT use by listing core measures that provide more specificity than prior survey efforts. The survey consisted of 10 questions. One question assessed 12 clinical functionalities and 9 administrative/quality enhancement tasks. Additional components of the survey included assessment of coverage status, queries on how HIT use may be expanded in the future, reasons for purchasing and implementing HIT from a clinical perspective, barriers to HIT implementation, perceptions of non-monetary resources and policy support that will aid expanded use of HIT, impact of ARRA-HITECH legislation and additional demographic variables. The survey was approved for use by the university’s institutional review board.

Survey Delivery: The authors collaborated with the Texas Department of Aging and Disability Services (DADS) to survey all LTCs in the state. DADS administered the survey to 1170 facilities in November and December of 2009 and in February and June of 2010. The same survey was administered in paper format to a small collection of industry leaders during a 2010 statewide conference. A key component of the survey compared HIT/EHR functional adoption rates among profit and not-for-profit facilities. To accomplish this task, an independent samples t-test was performed on the 21 HIT functionalities assessed. Examples included use of HIT to perform clinical or pharmacy decision support; use of E-prescribing, medication order administration; quality management and reporting, etc. Exhibit 1 presents the survey question used to assess HIT functional usage. After determining the current use of HIT in Texas LTC, we compared our findings to that of earlier surveys to provide insight on
HIT maturation and geographic variations.

Since adoption of EMR occurs in a step-wise fashion, stage-based models were used to compare adoption of EMR functionalities. Texas LTC results were placed in a hospital-based model developed by Health Information Systems Society Analytics (HIMSS Analytics\textsuperscript{TM})\textsuperscript{5} that depicted seven progressive stages of EMR maturation. Although the components for LTC EMRs were different than the hospital functionalities, the comparison of EMR adoption patterns was insightful. Within the LTC arena a model had been designed to reflect specific needs. This instrument, the Savage-Gutkind EMR Implementation model\textsuperscript{LTC} retained a stage-based methodology\textsuperscript{14}. Notably, the model extended the adoption strategy from a 7-step model to 10 steps, with the final stage representing a paperless LTC environment with widespread linkages to a variety of providers using health information exchanges. This model acknowledged that current LTC EMR software could not support Stages 8 – 10. Nonetheless, respondents were placed in stages based upon their use of technology to perform select staged-based tasks. To describe active use of HIT/EMR and to reflect the use of HIT to report residential quality assessments (MDS), the authors intentionally did not use the HIMSS strategy that required an entity to complete all aspects of an earlier stage before advancement to the next level.

Exhibit 1

How are you currently using health information systems and technology in your facility?

Check all that apply.

- Admittance Process
- Advance Directives
- Automated Clinical Decision Support
- Billing
- Calculation of outcome from MDS data (e.g., hospitalizations)
- Care Plan
- Clinical Notes
- Consults
- Incident tracking (e.g., fall management)
- Insurance Information and Eligibility
- Lab Orders and Results
- MDS Assessment
- Medical Orders/E-Prescribing/Medication Order Administration (MAR)
- Monitoring Systems (e.g., blood pressure, blood glucose monitors, weight scales, electronic thermometers, coagulation monitors)
- Occupancy Rates and Trends
- Quality Management and Reporting
- Pharmacy Decision Support
- Radiology (e.g., x-rays, etc.)
- Resident Demographics
- Safety Monitoring (e.g., fall monitoring using sensors, Internet cameras)
- Transfer or Summary Reports (e.g., discharge, transfer, consults)
RESULTS
The survey was delivered to 1170 facilities. Two hundred and fifteen surveys ‘bounced’ or were returned, while responses were received from 295 facilities. Accordingly, the response rate was 34%. While this response was less than a desired 40% return for electronic surveys, researchers believed this was a satisfactory baseline sample given that the proportion of responses from non-profit and profit-based facilities approximated the proportional ownership status as provided by DADS.

Nearly 80% of the surveys were completed by Administrators or Directors of Nursing (DON). Twenty-four percent of facility responses were from non-profit facilities. As shown in Table 1, we compared findings from our study to findings discovered in the 2004 National Nursing Home Survey12, state surveys of New York3 and Minnesota10 and the 2007 Multi-Facility Research Report by Maestro Strategies9.

Table 1. Comparison of Texas HIT LTC Utilization to Prior Surveys

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Admittance</td>
<td>191</td>
<td>70</td>
<td>939</td>
<td>11</td>
<td>68</td>
</tr>
<tr>
<td>Process</td>
<td>65%</td>
<td>100%</td>
<td>80%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Advance Directives</td>
<td>61%</td>
<td>100%</td>
<td>80%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Automated Clinical Decision</td>
<td>14%</td>
<td>100%</td>
<td>49%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Billing</td>
<td>257</td>
<td>70</td>
<td>1115</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Calculation of outcome from Care Plan</td>
<td>206</td>
<td>70%</td>
<td>575</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Clinical Notes</td>
<td>223</td>
<td>31%</td>
<td>575</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Consults</td>
<td>89</td>
<td>29%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Incident Tracking</td>
<td>137</td>
<td>30%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Lab Orders and Results</td>
<td>148</td>
<td>30%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>MDS Assessment</td>
<td>228</td>
<td>30%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Medical Orders/Prescribing/Medic</td>
<td>155</td>
<td>30%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Monitoring Systems (e.g., fall, etc)</td>
<td>79</td>
<td>27%</td>
<td>211</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Occupancy Rates and Trends</td>
<td>148</td>
<td>50%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Quality Management and Pharmacy</td>
<td>136</td>
<td>46%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Pharmacy Decision Support</td>
<td>68</td>
<td>23%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Radiology (e.g., x-rays, etc)</td>
<td>101</td>
<td>27%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Resident Demographics</td>
<td>170</td>
<td>58%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Safety Monitoring</td>
<td>80</td>
<td>27%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Transfer or Summary Reports</td>
<td>102</td>
<td>27%</td>
<td>50%</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>

Our analysis determined that 3 of the 21 HIT functionalities were addressed in each of the 5 surveys: Care Plans; Medical Orders/ERx/MAR; and Automated Clinical Decision Support. Seventy-six percent of Texas responders reported HIT use to perform Care Plans, a value only surpassed by Minnesota responders who reported an 85% utilization rate10. Texas was also second in use of HIT to capture lab orders/results, receive medical/pharmacy orders, and track occupancy rates and trends (Table 2).

Use of HIT to assist the admittance process, perform billing and to communicate MDS assessments were reported in 4 of the 5 surveys. Fifty-five percent of Texas facilities were using HIT for admissions, a finding that fell behind New York and National reports, yet ahead of findings discovered in the Maestro assessment and a function not addressed in the Minnesota report. Eighty-seven percent of Texas facilities used HIT to send claims, and 77% of Texas responders reported use of HIT to perform MDS assessment – each pattern falling in the middle of reporting found in the other 3 surveys. Unfortunately, the remaining 15 functionalities assessed in the Texas survey were either not reported or had limited reporting in the four comparison surveys. The exception was Transfer of Summary Reports, a function assessed in the New York and National surveys. Thirty-five percent of Texas responders reported using HIT to aid transfers or perform summative reports, as compared to 100% of New York facilities and 80% of National survey responders.

An independent-samples t-test found a significant difference in use of HIT among profit and non-profit facilities. For-profit facilities were more advanced in their use of HIT to perform billing, track MDS outcomes, capture lab orders/results, receive medical/pharmacy orders, and track occupancy rates and trends (Table 2).

The use of Stage-based models provided a dashboard of EMR maturation and allowed general comparisons to adoption patterns among hospitals. Although the comparison between LTC facilities and community/rural hospitals was not perfectly matched because setting functionalities differed, the results (Figure 1 and Table 3) indicated that some LTC facilities were slightly advanced from the hospital sector in the beginning and middle stages of HIT/EMR utilization. As presented in Table 4, a LTC stage model illuminates the journey toward full EMR in LTC facilities. Our findings suggest a majority of Texas facilities are in either Stage 1 or Stage 3 of the current 7-Stage adoption model (as depicted in Figure 2).

TPHA Journal Volume 64, Issue 3
### Table 2. Significant Difference in Use of HIT among Profit-Nonprofit Facilities

<table>
<thead>
<tr>
<th>Use of Information Systems to Complete Task</th>
<th>Profits (M,SD)</th>
<th>Non-Profit (M, SD)</th>
<th>t(293)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform Billing</td>
<td>.8929, .3099</td>
<td>.8029, .40070</td>
<td>1.98</td>
<td>0.049</td>
</tr>
<tr>
<td>Use MDS to calculate outcomes (hospitalizations)</td>
<td>.7411, .43903</td>
<td>.5634, .49950</td>
<td>2.872</td>
<td>0.004</td>
</tr>
<tr>
<td>Capture Lab Orders/Results</td>
<td>.5357, .49984</td>
<td>.3944, .49219</td>
<td>2.084</td>
<td>0.038</td>
</tr>
<tr>
<td>Receive medical orders/E-Prescribing/Medical Order Administration</td>
<td>.5625, .49719</td>
<td>.4085, .49505</td>
<td>2.277</td>
<td>0.023</td>
</tr>
<tr>
<td>Track Occupancy Trends</td>
<td>.5402, .49950</td>
<td>.3803, .48891</td>
<td>2.362</td>
<td>0.019</td>
</tr>
</tbody>
</table>

### Figure 1. Facility Use of Health Information Systems and Technology

### Table 3. Comparison of Texas LTC EMR Adoption to HIMSS Hospital Model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Hospitals</th>
<th>Rural Hospitals</th>
<th>Texas LTC *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ancillaries - Lab, Rad, Pharmacy - All installed</td>
<td>5.90%</td>
<td>10.80%</td>
<td>61.00%</td>
</tr>
<tr>
<td>2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable</td>
<td>12.60%</td>
<td>16.70%</td>
<td>34.00%</td>
</tr>
<tr>
<td>3</td>
<td>Nursing/Clinical documentation (flow sheets), CDS, may have Document Imaging; HIE capable</td>
<td>46.10%</td>
<td>33.50%</td>
<td>57.00%</td>
</tr>
<tr>
<td>4</td>
<td>e-MAR and e-TAR (Order Completion); electronic capture of orders (clinical care interventions administered and omitted)</td>
<td>13.20%</td>
<td>7.70%</td>
<td>34.00%</td>
</tr>
<tr>
<td>5</td>
<td>Closed loop medication administration</td>
<td>7.10%</td>
<td>50.00%</td>
<td>18.00%</td>
</tr>
<tr>
<td>6</td>
<td>Physician documentation (structured templates), full CDSS (variance &amp; compliance), full R-PACS</td>
<td>4.40%</td>
<td>1.40%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7</td>
<td>Complete EMR; CCD transactions to share data. Data warehousing; Data continuity with E.D, ambulatory, OP</td>
<td>1.10%</td>
<td>0.10%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Hospitals data used with permission from HIMSS Analytics Essentials of the US Hospital IT Market -- 6th Edition

*Stage placement is not dependent upon total completion of prior stage
Table 4. Adoption of EMR by Texas LTC Facilities

<table>
<thead>
<tr>
<th>Savage-Gutkind EMR Adoption Model LTC</th>
<th>EMR Components</th>
<th>Texas LTC EMR Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 10</td>
<td>Interoperable EHR, completely paperless, all clinical information can be exchanged with HIEs</td>
<td>5-7 years away and will require significant advances in interoperability and HIT standards</td>
</tr>
<tr>
<td>Stage 9</td>
<td>Decision Support, Automated clinical decision support linking evidence-based practice. Consists of knowledge engine, inference engine, and mechanism to communicate</td>
<td>Software not available, expected to be developed by vendors when Stage 7 has been reached by a majority of the industry</td>
</tr>
<tr>
<td>Stage 8</td>
<td>EDI and Ancillary Integration, electronic document management, standard electronic communication with lab/pharma, radiology w/imaging viewing capability</td>
<td>Software not available, requires other healthcare providers and ancillary supplier participation to integrate data</td>
</tr>
<tr>
<td>Stage 7</td>
<td>Clinical Documentation, electronic capture of all internal clinical documentation (progress notes, wound assessment, TB testing, immunizations, clinical flow sheets)</td>
<td>0.00%</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Care Planning, Electronic resident-centered, individualized care plans with problem statements (focused on quality, not quantity, of content)</td>
<td>0.00%</td>
</tr>
<tr>
<td>Stage 5</td>
<td>Assessments, electronic clinical assessment using structured templates; development of comprehensive interdisciplinary care plan; clinical decision support evoked with completion of care plan problems/interventions and orders</td>
<td>18.00%</td>
</tr>
<tr>
<td>Stage 4</td>
<td>e-MAR and e-TAR (Order Completion); electronic capture of orders (clinical care interventions administered and omitted)</td>
<td>34.00%</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Order Management, electronic capture of all clinical care interventions planned/ordered by care team using standard order sets and evidence-based practice</td>
<td>57.00%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>CDR, Controlled Medical Vocabulary, CDA, may have Document Imaging, HIE capable</td>
<td>34.00%</td>
</tr>
<tr>
<td>Stage 1</td>
<td>ADT (Census) and MDS, demographic and financial data, census transactions, electronic repository of MDS assessment and Resident Assessment Protocol (RAP) data</td>
<td>61.00%</td>
</tr>
</tbody>
</table>

Data from survey of Texas LTC providers, 11/2009-6/2010 N = 295

Figure 2. Comparison of Texas LTC EMR Adoption to National Hospitals

DISCUSSION
As health care is information intensive, the transition from a paper-based medical record to use of sophisticated technology to improve clinical care is considered a revolutionary step. Although omitted from incentive enhancements, LTC providers will be expected to have systems for interoperable communication with providers, hospitals and health information exchanges as new payment models are operationalized. Despite a lack of incentives for EMR use, the use of health information technology to provide care is proceeding in many LTC facilities. A majority of survey responders reported use of HIT functions consistent with a Stage 1 or a Stage 3 classification. This represents use of HIT to perform order management, to enhance care planning, and to use standard order sets. These findings are similar to adoption rates among hospitals as they begin their transitions to comply with HITECH meaningful use requirements.

The current study compared HIT use across prior surveys to ascertain regional variations and adoption trends. Only six of the 21 functionalities assessed were documented in the other surveys; one function was reported in 3 surveys. For these functions, utilization by Texas facilities placed usage in the middle of rankings for admissions, billing, care plan, MDS assessment and medical orders/e-Rsing/MAR.
The findings should be tempered as mid-ranking by Texas users in 2009/2010, as compared to the other surveys administered between 2004-2007, may overestimate comparable adoption of HIT functionalities because of temporal variance. Furthermore, Texas trailed other survey reports in use of HIT for automated clinical decision support and transfer or summary reports. Low use of these more advanced IT functions signify early rather than more mature adoption patterns. Advanced use of HIT discovered in New York State reflected a market represented by sophisticated managed care networks and advanced HIT capabilities. For some functionalities, responder confusion may have led to unintentional survey responses. As documented by Resnick et al.12 and Richard et. al.13, a lack of consistent descriptive terminology and nomenclature has limited extrapolation of survey findings.

The current study attempted to address inconsistency of terms by using core terminology as recommended by national authorities. Even with this format, we suspected misperception influenced survey reports. For example, the reported administrative use of HIT was perplexing because all facilities were mandated to use HIT for MDS assessments and Medicare/Medicaid billings. In Texas, 87% of responders reported using HIT for billing and 77% used HIT for MDS outcome assessment. A possible explanation of these discrepancies could be the outsourcing of this task to corporate headquarters/ outside vendors or a misunderstanding of the question. To improve instrument reliability, the authors included detailed descriptions of 12 clinical functionalities and 9 administrative/quality enhancement tasks. Despite this level of detail the survey findings suggested operational definitions might be subject to interpretation. This problem might have been mitigated as certification criteria for LTC EMRs were announced in November 2011. Future studies will assess HIT adoption by listing common EHR criteria as certified by the Certification Commission for Health Information Technology

To compare with other surveys, we placed responses into a stage-based model which helped to visualize the stratification of HIT adoption in the industry and in the state. The model suggested Texas LTC providers were in early adoption stages in their use of HIT. While the majority of responders were in Stage 1 or Stage 3, approximately 34% of respondents reported that they were applying HIT to capture orders (Stage 4), and 18% were performing electronic assessments including the development of comprehensive interdisciplinary care plans (Stage 5). It was unknown if these early adopters would continue to advance their use of EMRs to Stages 6-7, reflective of a complete electronic EMR with resident-centered care focused on quality not quantity of content. Future studies will assess the ongoing adoption patterns to ascertain if progressive adoption of functionalities will occur among the facilities.

The discovery that for-profit LTC facilities were more advanced in their use of HIT to perform clinical and quality tasks could reflect access to capital and facility size. Larger facilities or members of a corporate chain might view an EMR as providing added value that offsets acquisition and operational expenses. This discovery might portend difficulties for some non-profit entities as LTC providers would be expected to have systems to allow interoperable communication with providers and health information exchanges as new population-based payment models were implemented. Future studies will investigate this hypothesis with a more detailed analysis of facility characteristics (# of beds, SNF, ICF), ownership status (corporate, independent profit-based facilities, non-profit) and relationship to HIT adoption. Additionally, the Affordable Care Act of 2010 (H.R. Res. Public Law 111–148, 2010) has provisions that penalize hospitals for readmissions compelling hospitals to associate with long term care providers that can share information electronically thus improving communication of discharge status, medication changes and other factors when a resident has a transition in care.

A potential limitation of the study is response bias. As discussed in the Methods section, the survey response reflects the state mix of non-profit and profit-based facilities. The response rate of 34% provides an initial reading on use of HIT in the state. We anticipate that inquiry on use of HIT and EMRs can result in an overestimation of actual use. To mitigate this effect, language has been chosen to encourage participation among facilities that have a relatively low use of HIT. However, the rapid progression and evolution in use of HIT in health care can underestimate the current use as findings become obsolete within a matter of months. This may be less of a concern in LTC as time-based use of HIT to capture incentive monies is not a driver. However, impending market and payer changes are expected to nudge LTC providers on progressive adoption of EMR functionalities.

In summary, this study examined levels of HIT use and EMR adoption in Texas LTC facilities and found that less than a third were using EMR functionalities reflective of moderate levels of sophistication. A majority of responders reported early to mid-stages of adoption similar to hospital adoption patterns. Advanced use of existing EMR functionalities were not discovered. LTC facilities will be tasked with HIT development to improve interoperability and quality of care to meet the incentive-driven hospital and provider advances. Government strategies to provide financial support for LTC, especially small providers and non-profit facilities, were encouraged.

REFERENCES
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A Rural Local Health Department’s Journey toward Selecting an Electronic Health Record

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ABSTRACT

A small rural West Texas local health department’s (LHD) journey toward selecting and purchasing an electronic health record (EHR) began with five Doctor of Nursing Practice (DNP) students: 1) conducting a needs assessment and workflow analysis; and 2) evaluating for implementation five nationally certified EHR systems meeting stage I meaningful use requirements. After evaluating the data, the DNP students determined a hosted EHR would best meet the LHD’s needs. The LHD contracted with the West Texas Health Information Technology (HIT) Regional Extension Center (REC) to assist with vendor selection and provide application expertise to evaluate all aspects of the EHR system and purchasing contract. The LHD staff and HIT REC project manager participated in three online EHR demonstrations and one onsite visit to an LHD using the system. The reasons for selecting the EHR were the Health Information Management Systems Society (HIMSS) scores and interoperability, the vaccine inventory component, the benefits of the hosted EHR, ease of use, and flexibility in creating forms and retrieving reports and data. The LHD selected and purchased the EHR in June 2011.

Key Terms: electronic health records, electronic medical records

Electronic health records (EHRs) emerged as a phenomenon in the 1960s.\(^1\) EHRs with clinical decision support (CDS) have the potential to decrease costs and improve care quality, access, effectiveness, efficiency, and safety.\(^2\) Over the past decade, EHR use in the United States has increased significantly.\(^3\) To aid in creating the infrastructure for nationwide health information technology (HIT) and facilitate the transition from a paper medical record to an EHR, the Office of the National Coordinator (ONC) provides multiple state and federal initiatives.\(^4\)

The National Framework

In 2009, governmental legislation and regulations began molding the National Health Information Network (NHIN) through a campaign to transition all providers to an EHR by 2015. The Centers for Medicare and Medicaid Services (CMS) developed financial incentives for eligible professionals (see Table 1 and Table 2) and hospitals to adopt EHR technology and achieve meaningful use.\(^5\) The American Recovery and Reinvestment Act (ARRA) of 2009 defines the three main components of meaningful use as to use certified EHR technology in a meaningful manner (example, e-prescribing), for the electronic exchange of health information to improve health care quality, and to submit clinical quality and other measures.\(^6\)

The federal initiative outlined three stages for achieving meaningful use; each stage is progressively more difficult and technically challenging. The three phases stretch across several years and are highlighted in Figure 1. The federal initiative is currently operating under stage I rules. The rules-making process for stage II is ending, and the release of the final rules is expected in summer 2012. Once adopted, providers must implement stage II rules by 2013 to meet the meaningful use requirements. Stage III focuses on long-term plans to share data across health care settings through health information exchange (HIE) with interoperable standards and to improve population health and quality of care by 2015. To support providers in reaching meaningful use, the ONC funded 62 Regional Extension Centers (REC) across the United States. Texas has four RECs which will serve more than 6,500 primary care providers in their efforts to implement EHRs with $35.4 million in federal grant dollars (See Figure 2).

Table 1: Eligible Provider

<table>
<thead>
<tr>
<th>Eligible professionals under the Medicare EHR Incentive Program include:</th>
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<tbody>
<tr>
<td>• Doctor of medicine or osteopathy</td>
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<tr>
<td>• Doctor of dental surgery or dental medicine</td>
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<tr>
<td>• Doctor of podiatry</td>
</tr>
<tr>
<td>• Doctor of optometry</td>
</tr>
<tr>
<td>• Chiropractor</td>
</tr>
</tbody>
</table>

Table 2: Medicaid Eligible Provider

Eligible professionals under the Medicaid EHR Incentive Program include:
- Physicians (primarily doctors of medicine and doctors of osteopathy)
- Nurse practitioner
- Certified nurse-midwife
- Dentist
- Physician assistant who furnishes services in a Federally Qualified Health Center or Rural Health Clinic that is led by a physician assistant.

To qualify for an incentive payment under the Medicaid EHR Incentive Program, an eligible professional must meet one of the following criteria:
- Have a minimum 30% Medicaid patient volume*
- Have a minimum 20% Medicaid patient volume, and is a pediatrician*
- Practice predominantly in a Federally Qualified Health Center or Rural Health Center and have a minimum 30% patient volume attributable to needy individuals

* Children's Health Insurance Program (CHIP) patients do not count toward the Medicaid patient volume criteria.


Figure 1. Stages of Meaningful Use

Source: Department of Health and Human Services (DHHS), HIT Policy Committee, Meaningful Use Workgroup Presentation, 7/16/09.
Our Journey to EHR Selection
As a component of a Doctor of Nursing Practice (DNP) informatics course, five DNP students conducted a project that initiated Andrews County Health Department’s (ACHD) journey toward selecting and purchasing an EHR. ACHD is a small local health department (LHD) located in rural West Texas. The purpose of the EHR project was to begin to align ACHD with the national HIT framework. The project included two phases: 1) conducting a needs assessment and a workflow analysis; and 2) evaluating nationally certified EHRs meeting meaningful use stage I requirements for implementation.

The project’s short-term goals included evaluating funding options and signing a contract with the West Texas HIT Regional Extension Center (REC) to support the process. The RECs in Texas provide the following support services: EHR selection, implementation, and project management services; HIT education and training; practice workflow redesign; privacy and security consultation; partnering with state and national health information exchange (HIE); and ongoing technical assistance. The project’s long-term goals were to: 1) determine EHR costs and procure funding; and 2) select and purchase a certified EHR.

The Needs Assessment
ACHD provides public health services to all county residents and a variety of personal health services to low-income county residents. The personal health services consist of primary health care, family planning, immunizations, tuberculosis, and sexually transmitted infections/human immunodeficiency virus (HIV) services. The LHD has three providers (a physician 16 hours per month and two full-time nurse practitioners), three Registered Nurses (RN), and six support staff. The County provides the majority of ACHD’s funding. Other payment sources include grant funding from the Texas Department of State Health Services (DSHS) and reimbursement from Medicaid, Women’s Health Program, Children’s Health Insurance Program (CHIP), and Medicare.

ACHD had a paper appointment and medical record system. ACHD received paper copies of lab, x-ray, and diagnostic test results. Providers either called prescriptions to the pharmacist or hand wrote the prescription. ACHD electronically billed family planning and Medicare services. ACHD submitted immunization information electronically using the Texas Wide Integration Client Encounter System (TWICES), a DSHS computer program. TWICES uploaded data into ImmTrac (the Texas State Immunization Registry) biweekly.

As a public health clinic, ACHD had special needs. These include requiring ACHD’s EHR to communicate and report to DSHS when possible, to maintain an immunization inventory, and to upload the immunization data to ImmTrac. ACHD’s reporting requirements change annually or with grant funding; therefore, the EHRs’ flexibility with creating documentation and reports and retrieving data is an important consideration.

The DNP students conducted an evaluation of ACHD’s current service levels with respect to achieving meaningful use. The REC provided the Physician Practice Assessment tool used to assess the clinic’s readiness and capability. ACHD staff use limited technology, and although the computers are networked, each individual uses his or her computer as a stand-alone. The employees share printers on the network, but not applications.

Review of EHRs
After completing the Needs Assessment, the DNP students determined ACHD needed a hosted EHR instead of an onsite system. The
team determined the hosted solution (also referred to as cloud computing) was appropriate for the following reasons: ease of use; immediate availability of software updates; reduced start-up expenses; vendor provided system redundancy, backup, privacy and security; and ACHD’s limited IT support and expertise. The limitations of a hosted EHR system can be Internet connectivity and potential downtime. ACHD has a T1-line, which should decrease Internet connection issues.

Workflow Analysis
The Public Health Informatics Institute (PHII) recommends assembling partners and employing a Collaborative Requirements Development Methodology (CRDM) to: “analyze their business processes by collaboratively thinking through the tasks they perform to meet specific public health objectives; redesign business processes by rethinking the tasks to increase effectiveness and efficiency; and define system requirements by articulating what the information system must do to support the tasks.” In an effort to ideally optimize the processes as ACHD transitioned to the HER, the DNP students, ACHD staff, and West Texas HIT REC staff conducted workflow analyses prior to selecting the EHR. The workflow analyses process identified the pre-implementation or “current state” and prepared ACHD staff for the future state with an EHR. When transitioning from paper to an electronic environment, staff must map the current state of processes dependent on paper to ensure important steps are not missed. In addition, staff need to be aware of how and what they do with paper to consider ways to increase efficiency or improve patient safety and quality with the shift to the EHR.

Workflow is “what happens as a result of workflow members following an established path to reach a common outcome.” The workflow analysis consisted of determining the organization’s current structure, evaluating the LHD’s workflow progression, documenting the patient and staff activities from check-in to checkout, and creating a patient flow diagram. The workflow diagram served as a visual tool to illustrate the inefficiencies in the processes. In response, the stakeholders provided feedback and formulated a plan to improve the quality of care in the clinic. Staff resistance to change is common, and as expected some staff criticized and resisted the changes. Obtaining staff buy-in is important to successful EHR implementation and use. A key way to ensure buy-in is to involve staff in the pre-implementation phase, EHR selection, and implementation process.

The workflow redesign process essentially addresses who, what, where, and when of the critical clinical and administrative processes that change in a transition from paper record to an EHR. The LHD and HIT REC staff conducted additional workflow analyses and determined ACHD’s documentation and reporting requirements. Ultimately, the assessment provided leadership with evidence of how ACHD could streamline care in the clinic through process redesign and EHR implementation. The assessment also identified opportunities to potentially decrease ACHD’s employee full-time equivalent (FTE) needs.

Meaningful Use/EHR Certification
CMS require providers to attain “meaningful use” of certified EHR technology to receive the EHR financial incentives. Refer to Table 3: Meaningful Use Menu Set Criteria and Table 4: Meaningful Use Core Set Criteria. The CMS incentives are specific to Medicare and Medicaid providers. Medicare eligible professionals can receive up to $44,000 over a five-year period. Medicaid eligible providers may

<table>
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<th>Table 3: Meaningful Use Criteria – Core Set</th>
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<tbody>
<tr>
<td>Meaningful Use Core Set Measures (all 15 measures are required for meaningful use)</td>
</tr>
<tr>
<td>1. Computerized Provider Order Entry (CPOE) use</td>
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<tr>
<td>2. Implement drug-drug and drug-allergy checks</td>
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<tr>
<td>3. Generate and transmit permissible prescriptions electronically (only uncontrolled substances)</td>
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<tr>
<td>4. Record demographics (Preferred language, Gender, Race, Ethnicity, Date of Birth)</td>
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<tr>
<td>5. Maintain an up-to-date problem list of current and active diagnoses</td>
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<tr>
<td>6. Maintain active medication list</td>
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<tr>
<td>7. Maintain active medication allergy list</td>
</tr>
<tr>
<td>8. Record and chart changes in vital signs: Height, Weight, Blood pressure, Calculate and display body mass index (BMI), and Plot and display growth charts for children 2-20 years, including BMI</td>
</tr>
<tr>
<td>9. Record smoking status for patients 13 years old or older</td>
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<tr>
<td>10. Implement one clinical decision support rule relevant to specialty or high clinical priority (track compliance to that rule)</td>
</tr>
<tr>
<td>11. Report ambulatory quality measures to CMS or the States</td>
</tr>
<tr>
<td>12. Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, allergies), upon request (electronic copy must be in an electronic form—for example, through a patient portal or personal health record (PHR)</td>
</tr>
<tr>
<td>13. Provide clinical summaries for patients for each office visit</td>
</tr>
<tr>
<td>14. Capability to exchange key clinical information (for example, problem list, medication list, allergies, diagnostic test results), among providers of care and patient authorized entities electronically</td>
</tr>
<tr>
<td>15. Protect electronic health information created or maintained by the certified electronic health record (EHR) technology through the implementation of appropriate technical capabilities</td>
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Implementing, or upgrading to a certified EHR raises the bar by ensuring the EHR meets the federal standards and meaningful use criteria. The DNP students evaluated the five potential EHR systems designed for small provider practices using certification criteria from Certification Commission for Health Information Technology (CCHIT) and ONC Authorized Testing and Certification Bodies (ATCB). The DNP students evaluated each potential vendor’s development plans to help ensure continued certification in the future. Contracts with any EHR vendor should include language to provide service updates to meet future certification needs and routine maintenance issues that may arise.

**Costs**
Joining the West Texas HIT REC covered many of ACHD’s initial costs for support services. Support services can be a major expenditure for the clinic. For example, “the vendor selection process is complex, time consuming, and uses extensive personal and organizational resources.”

**Public Health Measures**

A certified EHR raises the bar by ensuring the EHR meets the federal standards and meaningful use criteria. The DNP students evaluated the five potential EHR systems designed for small provider practices using certification criteria from Certification Commission for Health Information Technology (CCHIT) and ONC Authorized Testing and Certification Bodies (ATCB). The DNP students evaluated each potential vendor’s development plans to help ensure continued certification in the future. Contracts with any EHR vendor should include language to provide service updates to meet future certification needs and routine maintenance issues that may arise.

**EHR Selected**
Prior to making a final selection, ACHD and HIT REC staff participated in three online EHR demonstrations. The ACHD director, an RN, and a HITREC representative traveled to an LHD to meet, talk with, and observe staff using the selected EHR system. ACHD selected eClinicalWorks as the EHR vendor because of Health Information Management Systems Society (HIMSS) scores and interoperability, vaccine inventory component, benefits of the hosted EHR, ease of use, and flexibility in creating forms and retrieving reports and data.

**DISCUSSION**
The West Texas HIT REC services were vital to the process of selecting an EHR and provided the application expertise. The HIT REC representative conducted additional workflow analyses, gathered current documentation requirements and forms, and scheduled and participated in the online and onsite demonstrations. The small rural LHD did not have the expertise to evaluate all aspects of the EHR system and purchasing contract or to make the best EHR selection decision.

ACHD staff has high expectations for the EHR selected. See Table 5: Staff expectations of EHR. The staff kept these expectations in mind when selecting the EHR.
Table 5: LHD Staff Expectations of the EHR

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<th>Expectations</th>
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<tr>
<td>1. Decrease medication errors</td>
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<td>2. Provide a better mechanism for updating the medication list</td>
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<td>3. Eliminate physician’s handwriting issues</td>
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<tr>
<td>4. Reminders to patients per patient preference for preventive/ follow up care</td>
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<tr>
<td>5. Improve preventive care services provided and compliance with clinical guidelines</td>
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<tr>
<td>6. Meet national EHR goals</td>
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<tr>
<td>7. Meet meaningful use and clinical decision support (CDS) criteria</td>
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<td>8. Reduce administrative and reporting burden</td>
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<tr>
<td>9. Retrieve files and sort medical records</td>
</tr>
<tr>
<td>10. Gather and help analyze data</td>
</tr>
<tr>
<td>11. Improve prescription process, patient safety, and workflow management</td>
</tr>
<tr>
<td>12. Conduct clinical quality improvement (QI) research</td>
</tr>
<tr>
<td>13. Provide clinical decision support (CDS)</td>
</tr>
<tr>
<td>14. Enhance practice management (integrate scheduling, billing, and coding)</td>
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the forefront when participating in and evaluating the online EHR demonstrations. For the system to meet the staff’s perceived benefits and expectations, an EHR meeting meaningful use and certification criteria was necessary.

SUMMARY

In summary, the short-term goals of the project were met. ACHD signed its contract with the West Texas HIT REC in September 2010. The DNP students and ACHD staff completed the needs assessment and conducted the workflow analysis in October 2010, completed the EHR evaluation in November 2010, and recommended an EHR vendor. ACHD with HIT REC assistance selected the vendor and purchased the EHR in June 2011. ACHD established a multidisciplinary team to prepare for implementation, and the EHR was implemented September 2011. The next step is to evaluate EHR documentation and use, streamline workflow and processes, and reach meaningful use by November 2012. The overall goals of EHR implementation are to eliminate paper medical records; improve clinic efficiency; provide consistent and quality health care services to county residents; and decrease the administrative reporting burden.

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A Comparative Study of Pesticide Use in Homes of Pregnant Women Living at the Texas-Mexico Border and in New York City

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The University of Texas Health Science Center San Antonio, Regional Academic Health Center (RAHC)-Harlingen, Texas, South Texas environmental Education and Research (STEER) Program

ABSTRACT

Pesticide exposure along the Texas-Mexico Border is of particular concern for vulnerable populations including children and pregnant women. Studies conducted by the Columbia Center for Children’s Environmental Health (CCCEH) have shown that fetal and childhood exposure to pesticides can be quantified in indoor air and can adversely affect neurodevelopment. We adopted the CCCEH protocol to evaluate pesticide use and to collect and analyze indoor air samples from the homes of 25 pregnant Hispanic women. We compared our results to those of the CCCEH study of minority women in inner-city New York. We found that although there were differences in patterns of use and the types and levels of pesticides detected, most of the homes had measurable pesticides, including organophosphates, synthetic pyrethroids, organochlorines, carbamates, and synergists. These exposures are not only potentially hazardous but also eminently avoidable, e.g., by using Integrated Pest Management (IPM), which emphasizes preventing pest infestations and using the least toxic pest control methods first. Public health and medical practitioners may help reduce pesticide exposure by advocating for IPM.

INTRODUCTION

Approximately 800 million pounds of pesticides are used annually in U.S agriculture. However, human health risks are also a concern in urban settings where relatively higher concentrations of residential pesticides have been found. The Minnesota Children’s Pesticide Exposure Study found that 97% of households contained pesticides and that 88% of those households reported pesticide use in the previous year. A finding that pesticide levels in the blood of mothers and their newborns were similar at time of delivery provides evidence that transplacental transmission of these chemicals occurs during pregnancy. The fetal brain develops throughout pregnancy, with a growth spurt during the third trimester. Animal studies demonstrate that pesticide exposure can adversely affect development and that deficits may not manifest until adolescence or adulthood.

A study of 254 New York City infants begun in 1997 showed that high in utero exposures to organophosphates were associated with significantly lower birth weight and shorter length. Those children who were exposed to the highest levels of chlorpyrifos in utero showed impaired mental and motor development at 36 months. Research conducted in Ecuador showed similar associations in school-aged children, and a recent California study reported a strong association (6-fold increase) between in utero exposure to organochlorine pesticides and autism spectrum disorders among children living near agricultural fields. Some studies have reported that even repeated low-level exposures to non-persistent pesticides in utero or after birth may increase the risk of adverse neurobehavioral and cognitive outcomes during infancy and childhood.

Pesticide exposure at the U.S.-Mexico Border. Residents of the U.S.-Mexico Border face a complex array of pesticide exposures due to year-round use of herbicides, fungicides and insecticides; close proximity of housing to agricultural fields; and associated risks such as workers bringing contaminated garments home. Heavy household use of pesticides may include unlabeled, EPA-restricted pesticides which are easily obtained from Mexico. Homes along the Texas-Mexico Border are often constructed from plywood, are not caulked and do not have screened windows and doors, creating numerous access points for pests. Studies show that pesticides used indoors may linger for years. Organochlorines such as DDT and chlordane, banned several decades ago, are still measurable in the air and dust of homes in which they were applied. Even organophosphates can persist for many years indoors due to lack of sunlight and soil microbial action to break them down.

Pesticide exposure in inner-city New York. The Columbia Center for Children’s Environmental Health (CCCEH) study documented widespread pesticide use among a cohort consisting of 525 mother/newborn pairs. Participants in this study were self-identified minority women of African American or Dominican descent living in northern Manhattan or South Bronx for at least 1 year before pregnancy. Air sampling showed detectable levels of three insecticides, chlorpyrifos, diazinon, and the carbamate propoxur, and one antimicrobial, o-phenylphenol, in every home (100%). Maternal and newborn blood levels were similar and highly correlated, indicating that insecticides are readily transferred from the mother to the fetus during pregnancy. Most significantly, the CCCEH studies provided evidence that, prior to the 2000-2001 EPA ban of residential use of organophosphates, chlorpyrifos and possibly diazinon exposures were adversely affecting fetal growth in this minority population.

In 2006, CCCEH assisted the University of Texas School of Medicine at San Antonio Regional Academic Health Center at Harlingen’s South Texas Environmental Education and Research (STEER) Program in developing the protocol and providing comparative data for a pilot pesticide study among pregnant Hispanic women of Mexican origin in South Texas. The purpose of this study was to assess residential pesticide use and exposure among these women in their third trimester and to compare results to the New York study.

Population and Methods

Study subjects. Between December of 2005 and July of 2006, we recruited 25 women from two maternity clinics in Hidalgo County, Texas. Participation was restricted to Hispanic women 18-35 years old at 30-34 weeks of gestation, with no serious medical condition. The institutional review board of the University approved the study, and written informed consent was obtained from all subjects.

Questionnaire Data. Three questionnaires, adapted from those used in the New York study, were administered by health professional interviewers in participants’ preferred language, Spanish or English. A one-page screening questionnaire was used to qualify participants, followed by a baseline questionnaire and a follow-up questionnaire. The 138-item baseline questionnaire gathered information pertaining to demographics, home characteristics, residential and occupational history, history of smoking, alcohol and drug use, diet, medications, supplement use, and pesticide use and exposure. Additional questions addressed the use of alternative medical practices, proximity to agricultural fields, and the frequency of sighting of spraying operations and/or detecting pesticide or other odors which may have drifted from nearby fields. A 50-item follow-up questionnaire was administered two weeks later to determine whether any changes in pesticide use had occurred following the baseline questionnaire and sampling.

Air Sampling. Indoor air pesticide monitoring followed the CCCEH
protocol to ensure that the New York and Texas exposures could be compared. Briefly, all indoor air samples were collected at a height of 1.35 m and at a flow rate of 0.5 L/min onto a quartz fiber filter and polyurethane foam plug over 14 days in the room where the participant spent the most time. An average of 10.08 m³ of air was drawn through the sampler. Air samples were collected between December 2005 and June 2006. The air monitoring samples were frozen at -20°C and shipped on dry ice for laboratory analysis. The filter and foam were Soxhlet-extracted together with 6% diethyl ether in hexane. Extracts were frozen at -20°C prior to analysis, a state at which pesticides are known to remain stable. Samples were analyzed using gas chromatography-mass spectrometry for 45 prevalent agricultural and residential pesticides using 5 different concentration levels of calibration standards (Table 1). Note: The Texas study analyzed samples for a greater number of pesticides than the New York study to include relevant agricultural pesticides.

**Statistical analysis.** We tallied the range of concentrations and the number of samples with levels above the limits of detection for the 45 pesticides or their degradation products. We also calculated the

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**Table 1 Pesticides measured in air of households of pregnant Hispanic women in South Texas**

<table>
<thead>
<tr>
<th>Organophosphates</th>
<th>Synthetic Pyrethroids</th>
<th>Organochlorines</th>
<th>Carbamates</th>
<th>Synergists</th>
<th>Fungicides</th>
<th>Insect Growth Retardant (IGR)</th>
<th>Herbicides</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azinophos-methyl</td>
<td>Bioallethrin</td>
<td>4, 4’-DDD</td>
<td>Bendocarb</td>
<td>MGK 264</td>
<td>Captan</td>
<td>Fenoxycarb (also carbamate)</td>
<td>Atrazine</td>
<td>Fipronil</td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>Bifenthrin</td>
<td>4, 4’,-DDD</td>
<td>Carbaryl</td>
<td>Piperonyl butoxide</td>
<td></td>
<td>Hydroprene</td>
<td>Metolachlor</td>
<td>Ortho-phenylphenol</td>
</tr>
<tr>
<td>Diazinon</td>
<td>Cis-permethrin</td>
<td>4, 4’-DDT</td>
<td>Carbofuran</td>
<td>Fendoxycarb (also IGR)</td>
<td></td>
<td>Methoprene</td>
<td>Simazine</td>
<td></td>
</tr>
<tr>
<td>Ethyl Parathion</td>
<td>Cyfluthrin</td>
<td>Alpha-chlordane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simazine</td>
<td></td>
</tr>
<tr>
<td>Malathion</td>
<td>Cypermethrin</td>
<td>Dieldrin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methyl parathion</td>
<td>Deltamethrin/ tralomethrin</td>
<td>Gamma-chlordane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propetamorphos</td>
<td>Fenvalerate</td>
<td>Heptachlor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lambda-cyhalothrin</td>
<td>Lindane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prallethrin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sumithrin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tetramethrin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trans-permethrin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2 Demographic characteristics of South Texas Hispanic women enrolled during last trimester of pregnancy (N=25)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. of subjects (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27 ± 5.2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Mexican–American</td>
<td>24 (96)</td>
</tr>
<tr>
<td>Other Hispanic</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>&lt;High school degree</td>
<td>21 (84)</td>
</tr>
<tr>
<td>High school degree or equivalent</td>
<td>4 (16)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married*</td>
<td>20 (80)</td>
</tr>
<tr>
<td>Never Married</td>
<td>3 (12)</td>
</tr>
<tr>
<td>Separated</td>
<td>2 (8)</td>
</tr>
<tr>
<td>Income</td>
<td></td>
</tr>
<tr>
<td>≤$10,000/year</td>
<td>18 (72)</td>
</tr>
<tr>
<td>&gt;$10,000/year</td>
<td>2 (8)</td>
</tr>
<tr>
<td>Unknown</td>
<td>5 (20)</td>
</tr>
</tbody>
</table>

Maternal age is reported as mean ± SD; the other items are the number of subjects (%) in each category.

* Includes women living as married with same partner
medians, means and standard deviations for agents detected in >45-100% of the air samples.

RESULTS
Table 2 provides demographics for the 25 participants in the Texas study. Most were Mexican-American (96%), with less than a high school degree (84%), married (80%), and had a household income of less than $10,000 per year (72%).

Table 3 compares the number and percentages of New York and Texas women who reported sighting pests in their homes and those who used some form of pest control.

Figure 1 illustrates pest control methods used to target cockroaches, rodents and other pests. Pest control methods were used in 17 of the 25 (68%) homes of Texas women participating in the study.

Table 3 Women reporting sighting and use of pest control measures in the home during pregnancy in South Texas vs. New York City.

<table>
<thead>
<tr>
<th></th>
<th>South Texas</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sighting</td>
<td>N=25 (%)</td>
<td>N=571 (%)</td>
</tr>
<tr>
<td>Total with pest sighting</td>
<td>23 (92)</td>
<td>467 (85)</td>
</tr>
<tr>
<td>- Cockroaches</td>
<td>20 (80)</td>
<td>384 (68)</td>
</tr>
<tr>
<td>- Rodents (mice and rats)</td>
<td>6 (24)</td>
<td>302 (54)</td>
</tr>
<tr>
<td>- Other pests¹</td>
<td>18 (72)</td>
<td>125 (25)</td>
</tr>
<tr>
<td>Total using pest control measures</td>
<td>15 (60)</td>
<td>410 (85)</td>
</tr>
<tr>
<td>- By an exterminator plus others</td>
<td>1 (4)</td>
<td>136 (28)</td>
</tr>
<tr>
<td>- By exterminator only</td>
<td>----</td>
<td>36 (8)</td>
</tr>
<tr>
<td>- By others only²</td>
<td>15 (60)</td>
<td>238 (49)</td>
</tr>
</tbody>
</table>

¹ Other pests were defined as ants and other insects not listed in the questionnaire
² The women herself, other household member or the landlord

Figure 1 Pest control methods used and target pests for South Texas Hispanic women who reported pest control measures used in their homes during pregnancy. N=17

Percentages of women who reported use of pest control methods are shown in Figure 1. Participants reported the use of 7 specific methods, and we evaluated relative frequency of the use of each method. Analysis was restricted to respondents who reported pest control use (17 of 25 women, or 68%).
Table 4 provides household air concentrations for 14 of the 45 pesticides or their degradation products measured over a 2-week period during participants’ third trimester of pregnancy. We detected o-phenylphenol in 92% of the air samples, followed by chlorpyrifos (organophosphate) in 80%, propoxur (carbamate) in 76%, diazinon (organophosphate) in 72%, and trifluralin (herbicide) in 60%. Nine other pesticides were found in less than one-third of homes, including detectable air concentrations of five synthetic pyrethroids. In addition, two organochlorines and one additional organophosphates were detected.

Table 5 compares indoor air concentrations of ten pesticides from the two studies. The comparison is only for the 10 pesticides that were tested for in both the New York and Texas studies. Organophosphates, carbamates and fungicides were detectable in a very high percentage in both studies. It is notable that the organophosphate malathion was detectable in three Texas homes (12%) but in none of the New York homes. This difference could be due to malathion’s widespread use in Texas for agriculture, residential landscaping, and pest control programs.

**DISCUSSION**

Our findings demonstrate widespread household pesticide use and exposure during pregnancy in a cohort of Hispanic women residing in South Texas. Sixty-eight percent of the women reported using pest control methods during pregnancy. Five or more pesticides were present in more than 60% of the homes. The pesticides detected at highest concentrations were the antimicrobial o-phenylphenol (92%), the organophosphates chlorpyrifos (80%) and diazinon (72%), the carbamate propoxur (76%), and the herbicide trifluralin (60%).

The Texas study found levels of four pesticides that were not included in the New York study, specifically the synthetic pyrethroids bifenthrin and cypermethrin, the herbicide trifluralin, and the synergist MGK 264. Bifenthrin, detected in 12% of the homes, is an EPA restricted-use pesticide. Bifenthrin’s half-life

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**Table 4 Air Concentrations of 14 pesticides in homes of 25 pregnant South Texas Hispanic women from 2005-2006**

<table>
<thead>
<tr>
<th>Pesticides</th>
<th>Detection Limits</th>
<th>No. above detection limit (% of homes)</th>
<th>Air Concentration (ng/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Median</td>
</tr>
<tr>
<td>Organophosphates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorpyrifos</td>
<td>0.1</td>
<td>20 (80)</td>
<td>0.79</td>
</tr>
<tr>
<td>Diazinon</td>
<td>0.1</td>
<td>18 (72)</td>
<td>0.30</td>
</tr>
<tr>
<td>Malathion</td>
<td>0.2</td>
<td>3 (12)</td>
<td>NC</td>
</tr>
<tr>
<td>Carbamates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propoxur</td>
<td>0.2</td>
<td>19 (76)</td>
<td>0.69</td>
</tr>
<tr>
<td>Synergist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piperonyl butoxide</td>
<td>0.2</td>
<td>2 (8)</td>
<td>ND</td>
</tr>
<tr>
<td>MGK 264</td>
<td>0.5</td>
<td>1 (4)</td>
<td>ND</td>
</tr>
<tr>
<td>Synthetic Pyrethroids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>trans-Permethrin</td>
<td>&lt;0.1</td>
<td>1 (4)</td>
<td>ND</td>
</tr>
<tr>
<td>cis-Permethrin</td>
<td>0.4</td>
<td>7 (28)</td>
<td>0.44</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>0.4</td>
<td>3 (12)</td>
<td>ND</td>
</tr>
<tr>
<td>Cypermethrin</td>
<td>0.2</td>
<td>4 (16)</td>
<td>ND</td>
</tr>
<tr>
<td>Organochlorines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>γ- Chlordane</td>
<td>0.4</td>
<td>2 (8)</td>
<td>ND</td>
</tr>
<tr>
<td>α- Chlordane</td>
<td>0.4</td>
<td>2 (8)</td>
<td>ND</td>
</tr>
<tr>
<td>Fungicides/disinfectant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ortho-phenylphenol</td>
<td>0.2</td>
<td>23 (92)</td>
<td>5.2</td>
</tr>
<tr>
<td>Herbicide</td>
<td>Trifluralin</td>
<td>0.4</td>
<td>15 (60)</td>
</tr>
</tbody>
</table>

NC=Not calculated; ND=Not Detected

1 Air concentrations of the following pesticides were not detected: atrazine, azinphos-methyl, bendiocarb, bioallethrin, captan, carbaryl, carbofuran, cyfluthrin, lambda-cyhalothrin, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, deltamethrin/tralomethrin, diethyl, ethyl parathion, fenoxycarb, fenvalerate, fipronil, heptachlor, hydroprene, lindane, methoprene, methyl parathion, metolachlor, pendimethalin, proallethrin, propetamphos, simazine, sulfluramid, sumithrin, tetramethrin.

2 Usual limits of detection (ng/m³); detection limits on concentration of the extract and the amount of air sampled over 2 weeks.

3 Means ± standard deviation (SD) were calculated if the pesticide was detected in >45% of samples

4 Not itself a pyrethroid, but is an adjuvant and indicator of exposure to pyrethroids
women were exposed to pesticides. In general, the New York house-
etiology and housing construction, the vast majority of pregnant 
In both the New York and Texas studies, despite different climates, 
cluded their reports of frequent pesticide application. The New York 
New York apartments had monthly exterminator visits, a practice rare in 
ith windows and doors normally kept closed. Further, the New 
chronic reproductive, developmental or carcinogenic effects of tri-
mean ± standard deviation (SD) were calculated if the pesticide was detected in >45% of sample 
ay concentration comparisons of 10 pesticides of the South Texas study vs. New York City study

<table>
<thead>
<tr>
<th>Pesticides</th>
<th>South Texas</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Detection Limits 1</td>
<td>No. above detection (% of homes)</td>
</tr>
<tr>
<td>Organophosphates</td>
<td>Chlorpyrifos</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Diazinon</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Malathion</td>
<td>0.2</td>
</tr>
<tr>
<td>Carbamates</td>
<td>Propoxur</td>
<td>0.2</td>
</tr>
<tr>
<td>Synergists</td>
<td>Piperonyl butoxide3</td>
<td>0.2</td>
</tr>
<tr>
<td>Synthetic Pyrethroids</td>
<td>trans-Permethrin</td>
<td>0,</td>
</tr>
<tr>
<td></td>
<td>cis- Permethrin</td>
<td>1</td>
</tr>
<tr>
<td>Organochlorines</td>
<td>γ- Chlordane</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>α- Chlordane</td>
<td>0.4</td>
</tr>
<tr>
<td>Fungicides</td>
<td>Ortho-phenylphenol</td>
<td>0.2</td>
</tr>
</tbody>
</table>

NC=Not calculated; ND=Not Detected
1 Usual limit of detection (ng/m³); detection limits varied depending on concentration of the extract and the amount of air sampled over 2 weeks.
2 Means ± standard deviation (SD) were calculated if the pesticide was detected in >45% of sample
3 Not itself a pyrethroid, but is adjuvant and an indicator of exposure to pyrethrins
4 New York study pesticide data was extracted from Table 3 of Environ Health Perspect 115;383-389(2007), and organochlorines and fungicides data of personal air sample (n=74) from Table 4 of Environ Health Perspect 2002 May; 110(5):A256-7

In soil can range from 7 days to 8 months, depending upon the soil type. Recent studies link prenatal and early post-natal exposure of synthetic pyrethroid exposure to autism. Notably, four pyrethroids were present in Texas and two in New York (Table 4-5). Cypermethrin, detected in 16% of the homes, is an EPA-registered pesticide used indoors. Animal studies suggest that neurodevelopmental, reproductive and immunological effects may occur following exposure to some pyrethroids, and at lower levels than those that produce overt signs of neurotoxicity here are no current data on the acute or chronic reproductive, developmental or carcinogenic effects of tri-fluralin.

In both the New York and Texas studies, despite different climates, ethnicity and housing construction, the vast majority of pregnant women were exposed to pesticides. In general, the New York households had significantly higher indoor airborne pesticide levels. Factors that could account for the higher levels in New York City include the fact that New York apartments are relatively tightly constructed, with windows and doors normally kept closed. Further, the New York apartments had monthly exterminator visits, a practice rare in South Texas. Unlike the study in New York, we did not test mothers’ blood for pesticides. However, the New York study has already established that household air levels of pesticides are a proxy for maternal and fetal exposure.

CONCLUSION
Our study demonstrated the presence of a variety of pesticides in the indoor air of homes of pregnant women in South Texas and documented their reports of frequent pesticide application. The New York study had similar findings and also showed that indoor pesticide levels were subsequently associated with neurodevelopmental delays in the children of the pregnant women in these households. There is ample evidence that pesticides adversely affect neurodevelopment. We have shown that residential use of pesticides is a common practice in South Texas during pregnancy. These exposures are not only potentially hazardous but also imminently avoidable, e.g., by using Integrated Pest Management (IPM). IPM is a method of pest control that uses the least toxic methods first and focuses on preventing infestation by removing sources of food, water, and harborage for pests.

Public health and medical practitioners may help reduce pesticide exposure by advocating for IPM. Additional studies in South Texas are needed to determine how to most effectively decrease residential pesticide exposure in pregnancy and to measure effects of IPM-based interventions on indoor air quality, biological measures of exposure, and neurodevelopmental outcomes.

ACKNOWLEDGMENTS
This work was supported in part by The University of Texas Health Science Center at San Antonio U.S.-Hispanic Nutrition Research and Education Center at the Regional Academic Health Center in Harlingen. We thank the Columbia Center for Children’s Environmental Health (CCCEH) for so willingly sharing their equipment and considerable expertise. We are grateful to Dr. Asa Bradman from the UC Berkeley Center for Children’s Environmental Health Research for advice on questionnaire.

We also thank Nuestra Clinica del Valle in Hidalgo County, Texas, for allowing us to recruit participants from their clinics and for the support of their nursing and laboratory staffs.

REFERENCES


Social Determinants of Health: Implications for Public Health, Medical and Social Interventions  
Hardy Loe, MD, MPH  
Principal, Hardy Loe Associates  

Editorial Note: This issue of our journal includes many special feature pieces in an attempt to put public health into perspective. Not an easy undertaking. As you will see, public health runs deep, with tributaries branching off in many directions. The first feature piece is a compilation of excerpts and highlights from presentations given to the Texas Health Institute, 10 November 2011 and a Scientific Session at the American Public Health Association (APHA), sponsored by the Committee on Affiliates, 31 October 2011 by Dr. Hardy Loe. It is accompanied by audience comments from the APHA session, compiled by our current TPHA president, Kaye M. Reynolds and TPHA Governing Councilor, Gloria McNeil.  

Dr. Loe practiced as a Public Health physician for the Houston Department of Health and Human Services for 4 years before joining academia and teaching public health practice for more than 35 years. He served as Associate Dean for Community Health before retiring. He is on the Board of Directors for the Texas Health Institute and serves as an active member of the Texas Association of Local Health Officers and the Texas Public Health Association. In the latter, he has served as program coordinator for annual meeting sessions and on the Governing Council.  

The Issue:  
Historically, successful efforts to decrease the levels of disease, injury, disability and death in populations have been characterized by early corrective interventions. The design of interventions has been guided by a growing understanding of causal influences, or determinants, of disease, injury, disability and death. Until recently this understanding of causal influences has been limited to processes and events in people’s lives that either pre-dispose them to or directly cause, illness or injury: infectious disease encounters, onset of chronic disease, obesity, hazardous exposures in the workplace and, more generally in society, risky behavior, trauma, war and terrorism, genetic disorders, chronic and mental stress, exposures of environmental hazards, to name a few. Fundamental to the application of early preventive and corrective intervention is an educated society and the availability of public health and medical care systems that have the expertise and resources to prevent or alleviate health problems.  

To illustrate the impact of corrective influences on disease/injury threats: the administration of immunizations prevents infectious disease; well-child clinics maintain good nutrition habits, prevent/detect early disease of children; the use of respiratory masks by workers prevents lung disease in occupational settings; while early pre-natal care reduces low birth weight of infants and infant mortality, and safeguards the health of mothers. Similarly nutrition education, reduction of exposures to hazards in work, play and home environments, and protection from contamination of food supplies or its consumption, avoids injury and disease; a more effective approach than resorting to treatment after the fact. As knowledge and experience increase in more recently developed fields, such as genetics, opportunities to prevent or ameliorate disease, and consequent disability and death may be expected to increase.  

Research into social conditions and their relation to health outcomes has led to an understanding that determinants of ill-health are not limited to exposure to infections, maternal and child health issues, trauma, mental stress and various hazardous exposures. It has become clear that disease and ill-health often result from the impact of social determinants, e.g., low levels of education; risky behavior; lack of income and/or employment; inadequate or dangerous housing, impacts of social, economic, and physical environments in neighborhoods and cities; the performance of political and economic systems; compounded by discriminatory practices in society associated with race, gender, age, and/or sexual preference. Accordingly the design of interventions has begun to include preventive and corrective strategies that focus on these broader social health determinants and their impacts at neighborhood or larger geo-political areas. The understanding of the timing of the impact of social determinants allows the introduction of interventions to move farther “upstream” in the evolution of health problems, where they are likely to be more effective. Operating examples of care that incorporate strategies and services which address social determinants and their impacts, are described later in the presentation.  

Much of the recent knowledge of the impacts of social determinants of health has been learned from research into how to address the health problems of populations who experience disparities in health status and in availability/accessibility of health and medical care compared to the general population. There is compelling evidence in health disparities research that the achievement of optimal health status of populations is dependent on 1) recognizing and responding to a broad array of social and economic stresses as definitive causes of disease, injury and death, and 2) generating timely measures to correct social inequities that transcend traditional threats to public health, medical services and supports.  

The Strategy:  
As the significant role of social determinants in defining and improving health status has been more broadly recognized and understood, the public health practice community, the American Public Health Association, the Institute of Medicine, the Centers for Disease Control and Prevention, the World Health Organization, the Robert Wood Johnson Foundation, and others have recommended that public health practitioners and organizations, medical care providers in office and hospital settings, community health centers, mental health practitioners and organizations, among others, re-think their roles and functions to include in their program planning and intervention strategies the implications of newer definitions of social determinants of health in the populations that they serve. The corollary to broadening the role and functions of public health organizations is to recognize the importance of establishing collaborative relationships with other institutions in the larger society who deal with issues like unemployment, urban planning and land use, education, public financing, parks and recreation, housing, etc., i.e., the fields of work associated with the list of social determinants described earlier; to generate more comprehensive community approaches to achieving improved population/individual health status. Many of these future collaborators are not traditionally thought of as contributors to the genesis and maintenance of health status even by themselves.
Background
As mentioned earlier, over time it has become apparent that the breadth of threats to health and the parallel range of preventive, corrective and/or restorative interventions extend the classical mission and capability of organized public health. In response, health departments have increasingly sought and established partnerships with other sectors of society to increase the range of relevant interventions: preventive, corrective (treatment) and restorative (rehabilitation). The broadening of the concept of health threats in society, beyond traditional public health concerns, as social determinants of health, opens the range of targets for improving health status to intervention in more fundamental aspects of people’s lives: income improvement, remedying gaps in education, re-creation of neighborhoods, safe housing, a re-emphasis on protection and maintenance of one’s mental health; to name a few.

Implications for organized public health
The message to public health organizations is to broaden the scope of public health interventions and to increase working collaboration with other sectors of society: the general public whose health is at risk, medical and dental practitioners, nurses, and, most importantly, the community service sector whose primary business it is to address that broader range of social determinants. Included in this group are educators, social workers, employment professionals, mental health professionals. In addition, the policymakers who define the mission and work of each of the above service organizations should be part of the collaboration. Finally, key to effectiveness of large diverse groups is the inclusion of those familiar with community organization and assisting in group decision-making, project planning and scheduling. The approach recalls the familiar public health scenario, as described earlier, of intervening as far “upstream” as possible in the sequence of events that generate negative health status to increase the probability of preventing those events altogether or, failing that, minimizing their impact. The challenge for public health practitioners, medicine, the broad array of community service organizations and relevant policymakers is to discover the means of making this happen.

Research Evidence for the Validity of Social Determinants of Health
- The Whitehall Studies I and II
Whitehall I and II are definitive investigations into the impact of social determinants on the health of British civil servants; both under the direction of Sir Michael Marmot, Professor of Epidemiology and Public Health at University College London. Professor Marmot was also the commissioner of the World Health Organization’s Commission on Social Determinants of Health until recently.

Whitehall I started in 1967 and examined over 18,000 male civil servants, aged 20 to 64, over a period of ten years, who were separated into employment grade levels. Twenty years later Whitehall II was started. 10,308 civil servants were examined, aged 35 -55, one-third of whom were women. A long-term follow-up of both is on-going.

The Whitehall cohort studies found a strong association between grade levels of civil servant employment and mortality rates from a range of causes. Men in the lowest grade (messengers, doorkeepers, etc.) had a mortality rate three times higher than that of men in the highest grade (administrators). The more senior a worker was in the employment hierarchy, the longer one might expect to live compared to people in lower employment grades. While there is a gradient in income and social position between the grades, those in the lower grades were not poverty-stricken. This suggests that income differences in the members of the study were less important than the differences experienced in social status in the two comparison groups.

Historically, public health and medicine have worked hard, with substantial success, to achieve working medicine/public health partnerships in the interest of improved health status and improved access to comprehensive public health and medical care interventions. The focus on social determinants broadens the complexity of that collaboration to include both new directions for public health and medical care organizations and creation of broader partnerships with community groups and organizations that are promoting income generation, successful educational achievements, correction of unsafe housing, improving the live-ability of neighborhoods as well as supporting/promoting social, economic political systems that facilitate achievement of good health by the community at large. This broader coalition holds the promise of much greater impact on the public’s health.

Deja Vu? - What is All the Fuss About?
Hasn’t public health, by definition always focused its interventions “upstream” in the chronology of the occurrence of causal predispositions and events associated with the occurrence of illness, injury and death? As mentioned in the beginning statements traditional public health interventions have been conceptualized as having an impact at the earliest point in the development of disease, behavioral/physical trauma, progression of chronic disease and disability, or threats to life. The point is made that the focus of public health has always been on determinants, described as: exposures to agents of communicable disease, poor dietary habits, personal toxins, e.g., cigarettes, lack of personal information about making healthful behavioral choices, and the prevention of or protection from hazardous environmental/worksite exposures. There has, however, been less focus by public health interventionists on correction of more fundamental social determinants such as lack of education, low income-poverty, living in unsafe neighborhoods, and lack of economic opportunity. Similarly, public health lore has not included education in the knowledge and skills of re-creating neighborhoods and social institutions, a locus, as will be described shortly, for focusing on social determinants.

While individual health departments have been involved with neighborhood development efforts, these approaches have not been part of the classical public health mission. Accordingly the roles to be played and the skills required in working with social determinants are not in the typical “public health tool-kit.” While early intervention as a strategy is fundamental to public health systems, these early intervention skills that have served public health so well have not often been directed to the correction of social determinants as described. Perhaps a surprising, but notable exception is found in the societal problems that led to the development and establishment of organized public health in England and the United States.

The Origins of Organized Public Health in England and the United States
Historically two individuals are credited with the genesis of organized public health as we know it in Europe and North America (this is not to slight the engineering accomplishments of the Romans in the provision and transport of water or in generating excellent waste disposal technology, but the understanding of the genesis of disease in populations and development of disease control technology belongs to a later era.). In England, Edwin Chadwick was appointed by Prime Minister Earl Grey to start an enquiry into the sanitation of the United Kingdom’s major cities. In 1842 he published a landmark report, “The Sanitary Conditions of the Labouring Population”, which reported that “the need to improve the living conditions of the poor and that the lack of public health was directly related to the lifestyles endured by the poor.”
In New England, 8 years later, Lemuel Shattuck, a vital statistician, among other things, published a Sanitation Report for the Massachusetts Sanitary Commission that became a model for state boards of health in Massachusetts (1869) and other parts of the United States, including the District of Columbia, California, Virginia, Minnesota, Louisiana, Alabama, Georgia, Maryland, Colorado and Wisconsin. He also focused on unsanitary conditions as the major health problem and his recommendations were adopted widely.

While not stated explicitly, these two reports identified living conditions of the poor and exposure to insanitary environments as “determinants” of ill health in the formative days of the public health enterprise in the West. Thus the idea of looking “upstream” from the occurrence of poor health for its causes in order to develop strategies for correction was established early in organized public health. Interestingly it did not become a generic intervention strategy until later.

The Influence of Policy-makers
Marc Lalonde, Canadian Minister of National Health and Welfare: In 1974 the Lalonde Report was produced in Canada which proposed a new health concept that “envisioned that the health field can be broken up into four broad elements: Human biology, Environment, Lifestyle, and Health care organization.” The implication was that determinants of health existed outside of the health care systems.

The report is considered to have led to the development and evolution of health promotion: Recognizing both the need for people to take more responsibility in changing their behaviors to improve their own health, and also the contribution of healthy communities and environments to health.

Julius Richmond, United States Surgeon General; United States Assistant Secretary for Health: Among many interests and accomplishments, Julius Richmond is well known for publication in 1979 of “Healthy People: The Surgeon General’s Report on Health Promotion and Disease Prevention”, a statement of quantitative goals for health promotion and disease prevention. Subsequently, through the Office of Disease Prevention and Health Promotion, the document has been issued each decade as quantitative goals for health promotion and disease prevention. Included are implementation strategies for the goals that identify interventions that focus on improving health.

Current Public Health Practice
Health issues, the populations affected and measures currently used by most public health practice organizations include:

- Infectious disease threats to the population at large are addressed with assistance of the private medical care sector through;
  - Essential components of disease reporting and epidemiologic investigation
  - Immunizations - In collaboration with schools and state laws requiring immunization for school entry;
- Maternal and child health threaten the low socio-economic populations and are addressed through
  - Nutrition counseling and provision of food to pregnant women and their children by Women Infants and Children (WIC) programs
- Chronic disease is a threat to the population at large with low socio-economic populations at higher risk. Examples include diabetes, heart disease, hypertension, cancer and others are addressed with assistance of the private medical care sector through;
  - Screening,
  - Education of the public and providers on prevention strategies

• Exposure to unsanitary food is a threat to the population at large and is addressed through
  - Warnings of contaminated food to limit consumption once source is identified
• Environmental quality control is a threat to the population at large. However, those living in industrial areas are often at higher risk and tend to be of lower socio-economic status. This is addressed through
  - Programs to assure safe air, water, land use,
  - Control of workplace hazards,
  - Nuisance abatement and neighborhood safety programs, Animal/rodent control
• Access to medical care often affects lower socio-economic groups disproportionately and are addressed through
  - Provision of personal public health services,
  - Referrals and assistance with transportation to providers

Important exceptions exist. Some health departments operate federally-funded Community Health Centers but for the most part health department programs focus on unhealthful conditions brought about in populations; usually not on the social determinants of those unhealthful conditions.

Social determinants not typically addressed directly by public health practice organizations include:

- Income, employment, community economics
- Education, generally (excluding school health and health education presentations)
- Genetics
- Mental health (addressed by public mental health provider agencies)
- Viability of neighborhoods
- Housing
- Social, economic and political systems
- Access to public health and medical care

There is substantial professional literature on each determinant on the foregoing list. To summarize what has been written in each area is beyond the scope of this presentation, however a brief assessment of two of them; housing and the viability of neighborhoods, are particularly relevant to threats of illness and injury to people at large and to the mission and work of public health departments, their sponsoring governmental agencies, and the medical care system.

Health Impacts of Affordable Housing on Health: A Research Summary by the Center for Housing Policy, 1900 M Street, NW, Suite 200, Washington, DC. The Center for Housing Policy is the research arm of the National Housing Conference, an organization dedicated to ensuring safe, decent and affordable housing for all Americans since 1931.

Most public health workers are not aware of the breadth of health issues related to the availability of “safe, decent, affordable housing”. In summary, available, stable housing encompasses issues of economics, mental health, and hazardous exposures. As well, continuity of medical care along with a reduction of risky behaviors may be seen. This list provided by the Center for Housing Policy explains how:

1. Affordable housing may improve health outcomes by freeing up family resources for nutritious food and health care expenditures.
2. Greater residential stability can reduce stress and related adverse health outcomes.
3. Stable, affordable homeownership may positively impact men-
tal health; the downside is the spectre of mortgage defaults and foreclosures.
4. Well-constructed affordable housing can reduce health problems of poor quality housing: injuries, allergens, neurotoxins and other; green building reduces pollutants, lowers energy costs.
5. Stable affordable housing may improve health outcomes in chronic illnesses by supporting on-going health care and reducing risky behavior.
6. By providing access to neighborhoods of opportunity, affordable housing strategies can reduce stress, increase access to amenities and generate health benefits.
7. Alleviating crowding can reduce exposure to stressors and infectious disease.
8. By allowing victims of domestic violence to escape abusive homes, affordable housing can lead to improvements in mental health and physical safety.
9. Supportive services provided in affordable housing can enable older adults, others with mobility limitations to stay in their homes.
10. Other benefits: improved sense of safety, decreased fear of crime, stronger impact on anxiety and depression
11. Accessible features support assisted living links with access to public health and medical care.

Viability of Neighborhoods
Fleming, D., Karasz, H., and Wysen, K., Public Health--Seattle, King County, “Making Up for Lost Time: Forging New Connections between Health and Community Development”. This article on Public Health from Seattle-King County describes the establishment of a collaborative project with departments of planning and development, transportation, parks and other experts in land use planning and design. Fundamental to this work is the development and adoption of “King County Board of Health Guidelines, Planning for Healthy Communities Guidelines” in 2010. The document promotes planning guidelines for communities in the areas of: Physical activity, nutrition, harmful environmental exposures, walking and biking, injury, violence prevention, tobacco and alcohol use, mental health and well-being and access to health care.

Interventions at the neighborhood and multi-neighborhood levels to assure the health of residents include, at a minimum, the availability or establishment of:
- Safe neighborhoods, schools, hike and bike paths, secure walking routes
- Accessible, safe public transportation, violence prevention
- Avoidance of high smoking, drinking
- Reduction of pollution, toxic exposures in the physical environment
- Incentives to retail establishments to increase accessibility to fresh fruits and vegetables
- Smart growth; clustering of homes near shopping areas, public transportation and employment possibilities, as well as accessible public health and medical care facilities
- Well-equipped parks and open spaces that allow organized community recreation

Planning and Implementing a Neighborhood System to Improve Health Status and Health Care
General principles revolve around forming a planning group of those who have a personal stake in receiving public health care and medical care to plan the neighborhood system. At a minimum, this core group should include: residents who have been involved in improving their community and who use those services frequently; community members who are recognized and trusted as leaders by their peers; representatives of providers of public health services, medical care, and appropriate academic representatives. Another group of key people to engage would be representatives of the disciplines identified as social determinants relevant to the new public health/medical care system, such as: technical experts in community health planning and health data systems; policymakers from the sponsoring local government (city, county or both); funders of public health and medical services and others as identified by the core group.

The role of the core group would be to:
- Identify health care needs (public health and medical care needs) and resources for the community, including social determinants of need
- Develop a series of critical issues related to the genesis of those needs and proposals for their correction
- Adopt a model of a community planning process for comparison; an example is the King County Board of Health Guidelines: Planning for Healthy Communities, as reported in the reference article, “Making Up for Lost Time: Forging New Connections between Health and Community Development”, Fleming, D., Karasz, H. and Wysen, K., Community Investments, Winter 2010-11, Vol 22, Issue 3
- Plan and Implement a Neighborhood Health System to address health needs of the community as identified in the planning process.
- Establish an evaluation plan to monitor progress and accomplishments.

Promoting Health Equity - A Resource to Help Communities Address Social Determinants of Health, is a document from the Centers for Disease Control and Prevention that focuses on the importance of inequity in health and the value of addressing social determinants to overcome them. It describes the inequalities in health status in the U.S. as large, persistent, and increasing. Poverty, income and health inequality, poor quality of life, racism, sex discrimination, and poor socioeconomic conditions are the major risk factors identified as contributing to ill health and health inequalities. Conditions such as polluted environments, inadequate housing, absence of mass transportation, lack of educational and employment opportunities and unsafe working conditions are implicated in producing inequitable health outcomes. According to this document, “Social determinants of health are life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education, and health (medical) care, whose distribution across populations effectively determines length and quality of life.”

The concept of equity embraces political, social and economic corrective strategies to combat societal drivers of inequity: economic and political systems and business. “Social determinants of health are life-enhancing resources, such as food supply, housing, economic and social relationships, transportation, education, and health (medical) care, whose distribution across populations effectively determines length and quality of life.”

Social factors such as violence in families, between partners, in schools and workplaces are often increased by social disadvantage. Identifying risk factors such as lack of education and life-skills training. Assessing the impact of neighborhoods and physical and social environments can be the first step toward eliminating or at least reducing, those risks. Realizing that those risk factors often affect whether residents smoke, have healthy diets and practice safe reproductive behaviors is the first step toward building healthy neighborhoods. The overwhelming weight of evidence indicates that physical, social and service characteristics of neighborhoods influence health in important ways, including by shaping choices and behaviors.
A comprehensive approach beginning early in life builds upon existing child survival programs and promotes health equity between rural and urban areas. This can be attained through sustained investment in rural development whereby policies and processes that lead to rural poverty, landlessness, and displacement of people from their homes are eliminated. Achieving health equity requires safe, secure, and fairly paid year-round work opportunities along with a healthy work-life balance for all. Building health-care systems in this way, where each is based on principles of equity, disease prevention, and health promotion, places responsibility for action of health and health equity at the highest level of government, and ensures its coherent consideration across all policies.

Implementing social determinants of health depends upon a conceptual, broad vision of understanding policy and technical requirements in order to develop appropriate intervention mechanisms. Examples from current experience include CDC’s “Promoting Health Equity” and the Robert Wood Johnson/Federal Reserve initiative. Other example projects to illustrate the point include: Seattle and King County - “The Intersection of Community Development and Health: A County-Level Initiative”, led by Dr. D. Worsham, Regional Health Officer of Seattle and King County, Washington describes how to move clinical/medical care as far upstream from the presenting illness and injury as possible. There are exciting new opportunities now on the horizon that will be made possible by the Preventive Provisions of the Affordable Care Act. A key resource in these efforts is the Centers for Disease Control and Prevention, “Promoting Health Equity, a Resource to Help Communities Address Social Determinants of Health”.

It all comes down to the basics: WHO: Public health practitioners, health departments and organizations (Local, state, national, international) and the public health workforce, clinical practitioners and medical care organizations, academic institutions, community partners and community health centers. Auxiliary groups such as Public Health Associations, Health Institutes and coalitions are instrumental in provision of excellent venues for education. Most offer annual education conferences, periodic training open to the general public, targeted seminars and diverse public awareness campaigns to achieve preparedness and wellness. Importantly, these groups promote legislation and policy development focused on population health. All lend themselves to those focused on influencing society and elected officials. WHAT: Societal interventions inclusive of broad social and environmental issues will maintain a focus on influencing determinants of health rather than departures from health. HOW: Through targeted groups such as task forces comprised of representatives of society and the technical interventions relevant to the issues at hand; work groups and partnerships within public health, educational, social service sectors that can develop, implement and evaluate projects. These groups must be armed with an understanding of the causality of determinants of disease and injury and be able to define interventions that focus on determinants. These groups must be familiar with resources to tackle organizational, planning and evaluation issues.

References and Resources
2. Gail Shearer, MPP, “Prevention Provisions in the Affordable Care Act”, American Public Health Association Issue Brief, October 2010
3. Wikipedia References 2011: Edwin Chadwick biography; Lemuel Shattuck biography; Marc Lalonde report, A New Perspective on the Health of Canadians, 1974; Julius B. Richmond Biography; Michael Marmot, Director Whitehall I and II Studies on Social Determinants of Health.
4. Centers for Disease Control and Prevention, “Promoting Health Equity, a Resource to Help Communities Address Social Determinants of Health”.
8. Satcher, David, Director, The Satcher Health Leadership Institute and the Center of Excellence on Health Disparities, Morehouse School of Medicine, “Social Determinants of Health and their Implications for Public Health”, Institute of Medicine 38th Annual Meeting, Washington, DC, 13 October 2008

Summary of Audience Discussion following the Presentation to the APHA Committee on Affiliates: Social Determinants of Health: Implications for Public Health, Medical and Social Interventions

The audience for the session was composed of 40-45 attendees, representing, primarily, local and state health departments and state public health associations. The discussion was led by Catherine Cooksley, DrPH and current Chair of the APHA Committee on Affiliates. She is a Senior Biostatistician at the Sealy Center on Aging, University of Texas Medical Branch at Galveston, Texas. Notes from the discussion, on which this report is based, were taken by Kaye Reynolds, MPH, Deputy Director Ft. Bend County, Texas, Department of Health and Human Services and Gloria McNeil, M.Ed, BSN, RN, Consultant in School Health, Houston, Texas. All are active members of the Texas Public Health Association and the American Public Health Association.

Basic issues identified in the discussion:
1. What is being done to define and use social determinants of health? The consensus was that state associations and other public health groups are doing very little in this area.
2. What are the problems in defining and using social determinants?
   - Proposing social determinants program development is often seen as policy promotion.
   - Better approach: Promoting as technical advancements for the community
3. Employees of government agencies may be reluctant to be seen as attempting to play the policy role.

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• Better approach: Clearly behave as advocates, not promoters of policy changes. An example to follow was offered by the Georgia Public Health Association who collaborated with the state health department on advocating issues around smoking.
• Health departments can advocate for establishment of community programs, e.g., walking trails, bike trails, both personal and community gardens

3. What will facilitate the use of social determinants? The consensus was that Public Health Associations can take on the task of developing and implementing the use of social determinants in public health planning and evaluation at the community level.

4. Partnerships are an essential device!
   - Collaboration examples:
     • Between local health departments, public health associations and state health departments: Missouri where the state PH association and the state health department have partnered for contract negotiations. This allows the PH association to facilitate the state role without being duly restrained by rules and regulations as would be the case if the PH association were the primary contractor.
     • Partner organizations that are outside the norm, e.g., Department of Agriculture, Parks and Recreation, Police Association, Chamber of Commerce, and Hospital Districts for maternal and child health leverage.
     • Partnerships can be particularly effective at fund-raising that will benefit the community.
     • Strong relationships with chambers of commerce, in particular the state chamber, can be more beneficial than working with the state legislature.
     • Partnerships have greater latitude: urban renewal projects, park development, fruit and vegetable gardens, job creation, i.e., issues that are not usually health department responsibilities.
     • Partnerships allow projects that health departments alone cannot do.
     • Partnership organizations can provide grant writers to help raise funds; occasionally can provide funds.
   - Partnerships where health departments have contracted with others who have more freedom to speak, have worked on access to care for rural populations and providing education regarding food choices
   - Key to success is partnering; clearly more partnering is fundamental to success.

5. Community projects identified in the discussion
   - In Arkansas communities met in Little Rock to address workplace wellness and access to health care. With state association participation, community input was obtained through visits to communities by getting involved with chain stores
   - Utah conducted a questionnaire survey regarding social determinants through an academia and state association partnership with The American Cancer Society, American Diabetes Association, American Heart Association, American Lung Associations, school districts and tobacco lobbyists. They used a short film, “A Place Matters” to start the narrative. Questionnaires have also been sent to policy makers in communities re: social determinants to gauge their knowledge level and understanding of issues before moving forward on projects.
   - In Seattle, the Housing Authority identified neighborhoods in need of revitalization and transformation from violence. County and state construction workers together with the Seattle Health Association designed a program around determinants and addressed housing development and promoted a green environment.
   - State Health Department roles included, financing, communication, marketing, education of the community to advocate for their needs with stores, e.g., persuade food stores to stock selections of vegetables, fruits and other healthy choices.
   - A communications instructor and former president of the Mississippi Public Health Association suggested that state associations could train trainers to carry out such neighborhood activities in their states.
   - In Kentucky the Chamber of Commerce, Board of Education and state association participate with groups and to help them increase their visibility.

“**If you’re going to San Fran-cis-co.....**”

Be sure to:
- Attend the APHA Council of Affiliates (CoA) events, trainings and scientific sessions.
- Reap the benefits of TPHA’s affiliation with the national public health group of movers and shakers.

Here is your advance glance for APHA 2012:
- Affiliate Day - 10/27
- Affiliate Executive Directors 10/29
- Affiliate New Leader Orientation - 10/27
- CoA Awards Reception - 10/27
- Joint CoA/ISC meeting - 10/28
- Candidates Forum - 10/29
- CoA/Student poster session - 10/29
- CoA/Affiliate poster session – 10/29
- CoA Scientific sessions (3 sessions)
  - Monday 10/29 12:30-2 & 2:30-4; Wednesday 10/31 12:30-2

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Editorial Note: Dr. Richard Wainerdi, is retiring as president of the Texas Medical Center. In 1960, he addressed a general session audience at the thirty-fifth annual meeting of the Texas Public Health Association. His address was published in the Texas Public Health Journal that year. To highlight the field of radiation physics in public health and to pay tribute to Dr. Wainerdi’s work, we bring you a reprint of the original scanned copy of the article. To contrast and compare the present to the past, the TPHJ offers highlights of his original address, accompanied by expert interview commentary. The TPHJ is extremely grateful to Dr. Mohan for taking the time to talk with Dr. Galeener to update public health professionals on this exciting field. We also acknowledge the assistance of Texas Department of State Health Services librarians, Carolyn Medina and David McLellan.

The TPHJ extends our thanks to Dr. Wainerdi for his commitment to educating the public health workforce on radiation physics and safety and wishes him all the best in his retirement.

**RADIOLICAL ASPECTS OF PUBLIC HEALTH**

*By Richard E. Wainerdi*

In discussing the radiological aspects of public health, I propose to present a brief picture of the overall radiological safety problem as it confronts the community rather than to discuss in detail any particular aspect of radiological health and safety. Because of your interest in public health, all of you are familiar with the radiological problems which would confront the community and therefore, the health official, in the case of a war-time nuclear bombing. That "acute" radiological problem has often been presented and discussed by the Civil Defense authorities. The "acute" nature of the bombing would include radioactive fall-out effects of areas around the site of the detonation, as well as direct contamination of the site.

The more immediate problem, however, and the problem far more certain to be faced by the public health officials of our country involves the peaceful application of nuclear energy. Some of these applications are not new, such as the use of x-ray machines and the use of radium which have been used for some time; others are quite new and expanding, such as the use of radioactive isotopes in medical and industrial applications and the use of nuclear reactors. The recent past has witnessed the growth of a program of development of the nuclear sciences in Texas and the Southest. At the present time, nuclear reactors are in operation in Fort Worth, College Station and in Houston with indications that in the not too distant future additional reactors will be operating at other locations in the State of Texas. Isotopes in substantial quantities are in use throughout the state at various research organizations, hospitals, clinics, universities, colleges and private industrial sites. All indications are that these users are merely the forerunner of increased important and publicly beneficial utilization of atomic energy.

When radioactive materials, nuclear reactors and other radiation producing devices are used by competent, well trained individuals with competent control, there is no public radiological problem. Public health dangers may arise from a few possible sources. One is the use of nuclear materials by people unfamiliar with their proper use and the other is through accidents incident to proper use. At the present time, federal statute does not require the licensing of those persons handling naturally radioactive materials, such as radium and other potentially dangerous radioisotopes. The regulations of the Texas State Department of Health, however, do regulate the use of these isotopes and should serve to limit their use by ill-informed persons assuming that the sufficient enforcement and regulatory controls are in the hands of the State Health Department. It might be possible to imagine persons improperly prepared to handle isotopes obtaining them by recovering im-disposed radioactive waste. For this reason, the matter of waste disposal is one which is given considerable attention by licensed users of radioactive material to insure that the disposal procedures which they exercise are in keeping with federal and state statutes and are, in fact, permanent removal of the radioactive material from future use.

In considering the hazards associated with radioactive materials, it is important to differentiate the hazards resulting from the different types of emitters of radiation. For instance, an alpha emitter is most hazardous when ingested, while a gamma emitter on the other hand can be hazardous internally but must be present in realtively substantial quantities to be a hazard from an external dosage standpoint. Some of the beta emitters, such as Strontium 90, can be especially insidious internally when they tend to accumulate in the body. It is to be emphasized that the biological retention of a particular isotope in the organism is the best way to measure its potential internal hazard, while the activity level (quantity) and energy level measure its potential external hazard. The bone seeker radioisotopes of some of the usual organic elements such as Carbon 14 and...
EVALUATE AND EDUCATE

We may now pose the question: what should the conscientious public health official adopt in discharging his duties and what they pertain to the radiological aspect of public health? In this regard, an early step which might be considered is the outlining of the various potential hazards from the above mentioned growth of the use of radioactivity.

It is interesting to note that in the early days of the development of electricity, there was considerable concern about the possible electrocution of large numbers of the citizenry through the improper use of that once new force. Education, care, and various legal preventive measures were combined to keep the electrocution toll to a minimum, although not entirely eliminating it. In a sense the hazards of radiation, too, must be balanced against the possible benefits to society which radiation in its carefully considered and intelligently executed application can bring. Since these benefits are worthwhile to society, if we prepare ourselves, if we educate the users of radiation and if we reasonably control their uses of radiation, there is every reason to believe that the potential contributions toward society of radioactivity will continue to blossom.

Radioactivity has capabilities for great benefit. You have read, for instance, of the use of teletherapy machines in wide use for the treatment of deep seated tumor cells; of the use of radio-iodine for the measurement of thyroid behavior; of the use of radioactive sodium to determine circulating blood volume and the dynamics of intravascular blood circulation; and of the use of radiation as a mechanism for sterilizing food.

It is proper for the public health official to be alert to the possible problems of atomic energy as he is alert to the possible blessings of atomic energy. It is his responsibility to be on guard in this new technological field as he is the guardian of the public’s health with regard to steam pollution, disease control and so many other areas. The universities and colleges and governmental agencies have an obligation to supply to the public health official the information which will help him in the discharge of his responsibilities. In this regard, the universities and colleges of Texas have embarked on programs of study and research in the areas of the nuclear sciences so that they will be capable in this field. Texas A and M’s Nuclear Science Center will, we hope, be of service in this regard.

Occasionally, we may grow tired of hearing about atomic energy and wish that the events of recent history in which this dynamic new force was put at our disposal had not occurred. We should, however, feel more truly that as the invention of dynamite brought with it challenges, it brought with it blessings; and that the nuclear sciences are in a sense a Phoenix bird rising from the ashes of war and possessing a great potential for peace. There is, in the atom, energy to cure disease, to generate power, to make radioactive tracers, or to do harm. It is by the means with which we discharge this challenge that we shall be measured by those who follow us.

System Radiological Safety Officer Texas A and M College System and Assistant to the Dean of Engineering A and M College of Texas


DO YOU KNOW —

That rabies is absent from many countries? According to a report from World Health (July-August, 1960), no case of rabies in animal or man has been reported in Norway since 1809, in Australia since 1867, in Sweden since 1871, in Denmark since 1889, in Ireland since 1903, in Great Britain since 1922, in the Netherlands since 1923, in Belgium since 1930, in Switzerland since 1949, in Singapore since 1953, in Hong Kong since 1955, in Portugal (Continued on Page 194)
The Evolving Face of Radiation as a Public Health Issue
Carol Galeener, PhD
Co-Chair of the Texas Public Health Association Editorial Board

Highlights from the original article, “Radiological Aspects of Public Health” by Richard Wainerdi, PE, PhD

• “...all of you are familiar with the radiological problems which would confront the community, and therefore, the public health official, in the case of a war-time nuclear bombing.”
• “The more immediate problem, however...involves the peaceful application of nuclear energy.”
• “...others [uses of radioactive substances] are quite new and expanding, such as the use of radioactive isotopes in medical and industrial applications and the use of nuclear reactors.”
• “Public health dangers arise from a few possible sources. One is the use of nuclear materials by people unfamiliar with their proper use and the other is through accidents incident to proper use. At the present time, federal statute does not require the licensing of those personnel handling naturally radioactive matters...The regulations of the Texas State Department of Health, however, do regulate the use of these isotopes and should serve to limit the use by ill-suited persons assuming that the sufficient enforcement and regulatory controls are in the hands of the State Health Department.”
• “In a sense the hazards of radiation ...must be balanced against the possible benefits to society which radiation in its carefully considered and diligently executed application can provide.”
• “You have read, for instance, of electrotherapy machines in wide use for treatment of deep seated tumor cells...”
• “It is proper for the public health official to be alert to the possible problems of atomic energy as he is alert to the possible blessings of atomic energy.”

Public Health and Radiation: A half century later...an interview with Radhe Mohan, Ph.D., FAAPM
Dr. Mohan is Professor, Department of Radiation Physics, Division of Radiation Oncology, The University of Texas MD Anderson Cancer Center, Houston.

Dr. Mohan, your life’s work has been in the science of radiation therapy for cancer. We would like to explore with you what has happened on the topic of radiation and public health since Dr. Wainerdi published an essay on the subject in the Texas Public Health Journal more than fifty years ago. What are some of the milestones in tool development?

Radiation is being used increasingly and successfully to treat cancers in all parts of the body. Currently more than 60% of cancer patients undergo radiotherapy by itself or in combination with chemotherapy and/or surgery.

Over the last 50 years, we have made tremendous progress in our ability to focus radiation dose to a much greater degree to the tumor while limiting doses to surrounding healthy tissues. This has allowed us to increase tumor doses, leading to higher cure rates with fewer side effects.

The main advances that have made this possible include, first of all, important developments in hardware and software. For example, linear accelerators generate higher energy x-rays for treating deep-seated tumors while proton accelerators form proton beams that can...under ideal circumstances - deposit less dose before reaching the tumor and virtually no dose beyond the tumor. There are also internally applied radioactive sources. Powerful computers and sophisticated software now help us in designing optimum radiation treatments, e.g., three-dimensional, intensity modulated, image-guided and adaptive radiotherapies. Visualization advances have also played a huge role. For example volumetric (three-dimensional) imaging of anatomy, function and biology involves CT scanners, MRI, PET to diagnose the disease, define targets of treatment and define critical normal tissues to be avoided, and to study treatment response.

A second area to mention is improved understanding of radiobiology of cells and tissues, leading to better understanding of how to enhance the effectiveness of radiation combined with chemotherapy agents to kill tumor cells.

Are you concerned, Dr. Mohan, about the potential public health hazard associated with substantial amounts of radiation waste and exposures that result from all of these different forms of treatment?

We should all be concerned and minimize exposures to radiation. However, it is necessary to balance risks vs. benefits. The risk of cancer induction increases with the level of exposures. In light of this, regulatory bodies have set different limits for health care workers, nuclear industry workers, patients and the general population with the goal of minimizing the average cancer rate. Exposure levels for the general population are lower than for those who work with radiation.

In the case of cancer patients, when people are treated with radiation the cells that are killed with high radiation doses do not lead to secondary cancer. However, the cells that receive low doses from scattered radiation far from the primary cancer site may be damaged and, as a result, may mutate into secondary cancer cells. As cancer patients are living longer, the incidence of secondary cancers is rising, especially among pediatric patients.

The side effects of high doses of radiation for cancer patients can be significant. They can be of the acute or late (chronic) variety. Acute effects may be serious enough to require a suspension of treatment, though this is happening less and less due to medical interventions, e.g., pain medications. Late effects are of greater concern. One example is the damage to the heart long after radiation treatment for breast cancer, Hodgkin’s disease, lung cancer, etc. Another example is bone deformities and growth defects in pediatric patients. Yet another is cognitive deficits for brain cancer patients treated with radiation.

The goal always is to minimize the dose to normal tissues. However, considerable additional research is needed to understand the tolerance limits of various tissues and even individual patients (“personalized therapy”), and how to balance delivering adequate tumor dose vs. keeping the normal tissue dose to below tolerance levels.

In addition to medical sources of radiation (radiation therapy, x-rays, CT scans, PET scans), the general population may receive small radiation doses from airport scanners, during airplane flights, ground radon and natural background radiation. Additional risks posed by these sources are considered to be negligible based on current evidence.

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Concerns related to medical radioactive waste are diminishing because of the continuing transition to short lived isotopes and the replacement of Co-60 machines with linear accelerators. However, there is a growing concern about waste from nuclear power plants. The regulatory environment has attempted to keep pace with technological developments and, to a great extent, has been highly successful. Radioactive materials have become tightly monitored and controlled both to prevent their accidental or deliberate misuse and to limit exposures, as previously mentioned.

In regard to nuclear power plants, real or potential accidents or disasters (Three Mile Island here in the United States, Chernobyl, and Fukushima) continue to be of major concern.

While we have learned a great deal about the risk of radiation from all sources, there is still a lot more to be discovered. Questions need to be answered about the long-term cumulative effects on the general population of exposure to the growing number of diagnostic scans, which are sometimes overused, as well as airport scanning devices, taking airplane flights, etc., especially as the life expectancy of a large part of our population continues to grow. We should be aware of the need to conduct more research in this area.

How would you summarize what has happened with regard to radiation and public health in general in the last 50 years?

Let’s talk about areas of concern first. These include:
1. Overuse of diagnostic devices
2. More people flying more

Dr. Mohan, is there some place our readers can go to further their understanding of the evolving high tech approaches in battling cancer?

There is a website sponsored by the Radiological Society of North America that has a great deal of information. The URL is http://www.radiologyinfo.org/. From there you can input “radiation therapy” or other terms into the search facility to get a better understanding of the tools and techniques of radiation therapy. It is also edifying to me to learn that the Texas Public Health Journal has been bringing information on this topic to the public health community for more than fifty years.

Women’s Work Preparing for Disasters in the United States
Carolyn Medina, MA, MLIS
Center for Health Statistics
Texas Department of State Health Services, Austin, Texas

After the attacks of September 2001, people in the United States became very concerned about possible threats from terrorists and other enemies of the United States. Efforts were made to increase our Homeland Security. Funds were encumbered; preparedness plans were enacted; drills were held; new security measures were implemented. Life in the United States seems like it will never be the same. What is interesting is that this concern over our nation’s security is not a new occurrence. For those who lived through World War II and the attack on Pearl Harbor, they know that the United States has always had enemies. What is now called Homeland Security was known then as Civil Defense. What is especially interesting is the role that women played in our civil defense in the 1940s and 50s and even before, when the stereotype was that women stayed in their homes, cooking, cleaning, and raising their children.

According to a history of civil defense, there was an 11-member Woman’s Committee appointed in 1917 to coordinate and stimulate women’s war activities. Once World War I ended, civil defense activities ceased. During World War II, civil defense once again became a priority. Fiorello La Guardia, mayor of New York, was appointed as Director of the Office of Civilian Defense, although he continued as Mayor of New York as well. Mrs. Eleanor Roosevelt was later appointed as Assistant Director. She focused on organizing volunteer offices throughout the country. Once these were established, she resigned. Mr. La Guardia was replaced by 1942 and the whole agency was abolished on June 30, 1945.1

In the early 50’s, citizens once again became concerned about their safety and Texas women were very much involved. In 1952, a Women’s Civil Defense Planning Conference was held in Austin. It was a two day conference that included delegates representing about 30 state-wide women’s organizations. Delegates asked the State Civil Defense director “to suggest to local civil defense authorities that a woman be appointed as coordinator of women’s activities.”2

Another resolution was that youth be included in civil defense activities. Here at home in Texas, it was suggested that the women of Texas be organized for civil defense on a block-by-block basis. Conference delegates pushed for the motto, “Civil Defense – A Family Affair,” believing that families were responsible for their own security – a theme that continues today. The methods of spreading the word have changed but the message has not. See, for example, the Texas Prepares campaign and its website at http://www.texasprepares.org/

Practicing responses to natural or manmade disasters is nothing new either. The Texas Health Bulletin reports that a drill was held in December 1952, called the “Lemon Juice Alert!” No advance warning was given to participants because the state coordinator, William McGill, wanted to see how long it took for his team to assemble. The State Health Department’s main representative was occupied so his alternate, Miss Mildred Garrett, director of public health nursing, was called into action. The alert was called at 7 a.m.; by 8:15 the first (pretend) fire was reported. The goal was to test the efficiency of communications in this civil defense region.” The simulated exercise purported that the port of Houston was being attacked; multiple fires in the ship channel broke out, even missiles carrying atomic warheads were reported.3 It was a horrible scenario but the communications worked “adequately” and the all clear was given at 9:56. Thankfully, it was only a drill. Organizing rosters of medical professionals to assist in times of di-
saster is also nothing new. In 1952 approximately 20,000 nurses were registered in Texas but planners were worried because 9,000 had out-of-state addresses and 7,000 were thought to be inactive. At the Civil Defense Conference, calls were made for an accurate roster of nurses set up by county in times of natural disaster or possibly an atomic attack. In modern days, health professionals and others can volunteer ahead of time to help in times of disaster. See Community Preparedness at http://www.dhs.state.tx.us/volunteer/

The Red Cross was already training individuals to respond in times of emergency. The state health department became involved as well. They created a refresher curriculum for nurses, “Introduction to Nursing Preparedness for Health and Emergency Medical Service,” that was to be used in addition to Red Cross training courses. At a training course for nurses held in the fall of 1953 by the Austin Office of Civil Defense and Disaster Relief, technological information was given on radiation detection instruments. In 1954 state officials were already working on a familiar question we hear today: how to credential volunteers for work in a disaster. “One suggestion was that the local community organization might find it feasible to issue some ‘piece of paper’ that would serve as a pass to the appropriate installation in which the nurse would be assigned to serve in case of disaster.” Again technology has changed but not the message, they prepared “mimeographed material on family food in emergencies.” Today on the internet you can find the family supply list at http://www.texasprepares.org/campaign/PREP_SupplyList.pdf

Work by women continued throughout the 1950s. In the summer of 1956, the Women’s Advisory Council for Defense and Disaster Relief representing women’s organizations from throughout Texas held another conference. They were told that the state had instituted a statewide system of radar equipment for detecting severe weather. Red Cross courses were being taught. Emergency Health and Sanitation as well as Radiological Monitoring courses were being offered by the state health dept. for its citizens. It was reported that: “Women can help with home nursing, first aid, casualty aid stations, hospitals and public health programs. Women will be in charge of reception centers for evacuees, and will have positions of responsibility and authority regarding feeding, shelter, sanitation facilities, first aid and welfare.” The work of preparing for disasters is never finished. Even if we are not concerned about a specific foreign enemy, natural disasters are common in the state of Texas. It is interesting to see the various threads of preparedness that have remained constant throughout the last sixty years. Although names of preparedness departments may change, the activities and plans do not change radically. And families of Texans continue to be exhorted by their government to “Get Prepared.”

Resources

Texas Prepares: http://www.texasprepares.org/ When disaster hits, Texans need to be ready. Use these online resources to build your plan - including family strategies, handy checklists, and special needs considerations for people with disabilities, the elderly and pets. Read the Texas Homeland Security Strategic Plan 2010-1015 at: http://governor.state.tx.us/files/homeland/HmLndSecurity_Strat_Plan2015.pdf

Helpful Phone Numbers taken from the Governor’s Preparedness Website:
Evacuation Information: 2-1-1
FEMA: 1-800-621-3362
Food Stamps: 1-800-221-5689
American Red Cross: 1-800-733-2767
Roadside Assistance: 1-800-525-5555
TxDOT Statewide Road Closures: 1-800-452-9292
Relay Service: 7-1-1 (Hearing Impaired and Visual Disabilities)

REFERENCES
Poison ivy (*Toxicodendron radicans*) is a member of the cashew family (Anacardiaceae) found in North America, Central America, and Asia that also has been introduced to Europe, South Africa, Australia, and New Zealand.\(^1\) It is a low shrub or woody vine. Its leaves are shiny and dark-green with smooth, serrated, or lobed edges and are clustered in threes.\(^2\)\(^,\)\(^3\)

Contact with *T. radicans* may result in dermal irritation. The substance that gives *T. radicans* its irritant effect is urushiol, an oleoresin that is a mixture of compounds, the most active component of which is 3-n-penta-decyl-catechol.\(^1\)\(^,\)\(^2\) Eighty percent of individuals who are exposed to urushiol develop contact dermatitis.\(^1\) The substance is present in all parts of the plant and can remain active long after the plant has died.\(^2\)\(^,\)\(^3\) The symptoms of contact with urushiol are itching, burning, and redness of the skin followed by small blisters.\(^2\)

A study of elevated atmospheric carbon dioxide in an intact forest ecosystem found that higher carbon dioxide levels increased *T. radicans* photosynthesis, growth, and population biomass with the growth greater than that of many other woody plants. Moreover, at higher carbon dioxide levels, *T. radicans* plants produced a more allergenic form of urushiol.\(^1\) According to information provided by the Earth System Research Laboratory of the National Oceanic and Atmospheric Administration (Dr. Pieter Tans, www.esrl.noaa.gov/gmd/ccgg/trends/), the mean annual atmospheric carbon dioxide concentration measured at Mauna Loa Observatory, Hawaii, increased approximately 5.4% from 366.50 parts per million in 1998 to 387.35 parts per million in 2009. Thus, as world-wide carbon dioxide levels increase, *T. radicans* might be expected to not only become more plentiful but also more hazardous.\(^1\)

Table 1 presents the annual number of *T. radicans* exposures reported to the Texas Poison Center Network (TPCN) during 1998-2011 and for two time periods (1998-2004 and 2005-2011). The total number of exposures declined during the fourteen-year period. However, the serious outcome rate (moderate effects, major effects, and not followed but judged potentially toxic) increased when both the annual rate and 1998-2004/2005-2011 rate were examined. This increase was statistically significant.

If the severity of *T. radicans* exposures is, in fact, increasing in Texas, then it might be important to educate the public of this situation. However, this is an analysis of a single data source. It would be interesting to see if data from other sources such as primary care physicians, dermatologists, emergency departments, and pharmacy sales of *T. radicans* therapies in Texas demonstrated similar trends.

### REFERENCES

Texas Black Widow Spiders Take the Heat

The black widow spider (Latrodectus mactans) is one of the more dangerous spiders in the United States. The spider is 1-2 cm in size and shiny black in color with a red hourglass shape on its ventral abdomen. Black widow spiders typically inhabit dry, dark, protected environments outdoors or in basements, sheds, and garages. When a person is bitten by a black widow spider, they may experience a sharp pain that soon disappears. A mark resembling a target may appear where the bite occurred, but this too may fade. The most frequently reported symptom is muscle pain or cramping, often in the chest, back, or abdomen, which may occur one hour or more after the bite. A bite victim may also experience fever and chills, nausea and vomiting, malaise, salivation, diaphoresis, hypertension, tachycardia, headache, and dysphoria. Bites may be treated via administration of calcium gluconate and analgesics, hydration, and stabilization of blood pressure. If the bite is severe, antivenin may be administered. Deaths may occur but are rare.1-4

In 2011, the news media reported an increase in encounters with black widow spiders in Oklahoma. The number of black widow spider bites reported to the state’s poison center doubled, and pest exterminators reported an increase in the number of calls received about the spider over previous years. This increase has been blamed on the drought and heat-wave affecting the state. The explanation was that either the spiders were seeking cooler places to live in or around people’s homes or their prey were being forced closer to homes.5,6

Black widow spiders also are found in Texas.7,8 In 2011, Texas experienced the hottest June-August on record and the longest drought on record for the state with November 1, 2010, to October 31, 2011, being the driest one-year period in the state’s history.9,10 Table 1 presents the monthly number of black widow spider bites reported to Texas poison centers during 2008-2011. The number of reported bites in 2011 did not appear to be elevated when compared to the previous three years. This may suggest that black widow spiders in Texas are not being affected by the drought to the degree they are being affected in Oklahoma. However, it should be noted that reporting of black widow spider bites to Texas poison centers is voluntary, and the tendency to report such bites might vary over time. It may be that people who are bitten by black widow spiders were less inclined to contact Texas poison centers in 2011 than in previous years.

REFERENCES

Table 1. Monthly number of black widow spider bites reported to the Texas Poison Center Network

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Potential Pediatric Hazard: New Laundry Detergent Packs or Pods

A new type of laundry detergent product, introduced in the US in early 2012, consists of small, single-dose packs (pods) of laundry detergent. These packs contain highly concentrated laundry detergent surrounded by a soluble membrane that dissolves during the washing cycle. These products include TideTM Pods, PurexTM Ultra Packs, and AllTM Mighty Packs Liquid Laundry Unit Dose.1-3

Because these concentrated laundry detergent packs are colorful and squishy and may resemble candy or toys, they may be attractive to young children.3 Similar products have been available in Europe for over ten years, where they have resulted in hundreds of calls to poison centers in various countries.4-6 Shortly after the introduction of laundry detergent packs in this country, poison centers in the US began to receive calls about pediatric exposures to them.1,2 Some children who ingested these products have become very ill and required hospitalization.1 Symptoms may have rapid onset. Ingestion of the products has been associated with vomiting, coughing, nausea, drowsiness, wheezing, laryngospasm, and seizure-like activity.1,2,5 Several children have had to be placed on ventilators.1,2,4 Children who got the products in their eyes have suffered from eye irritation or pain, conjunctivitis, and corneal lesions or keratitis.1,4,5 Dermal exposures have resulted in skin irritation such as rashes and burns.1,5 According to a study involving exposures to this type of product reported to a poison center in Italy, the outcomes of these exposures tended to be more serious than those involving traditional laundry detergents.4

The US news media began to extensively report about these pediatric exposures around May 23, 2012.1-3 As a result, at least one manufacturer is planning to make the products’ containers child-resistant.8

Texas poison centers began receiving calls about these concentrated laundry detergent products in February 2012. As of June 14, 2012, they have handled 139 exposures to these products, 127 of which involved children five years or younger. Of the pediatric exposures, 66% involved TideTM, 18% AllTM, 12% PurexTM, and 4% unknown type of product. Fifty-eight percent of the children were boys and 66% involved TideTM, 18% AllTM, 12% PurexTM, and 4% unknown type of product. Fifty-eight percent of the children were boys and 37% were age two years. The preponderance (80%) of the exposures occurred by ingestion alone, 9% ingestion and dermal contact, 6% ocular alone, 2% dermal alone, 2% ingestion and ocular, 1% ingestion and aspiration, and 1% dermal and ocular. Ninety-four percent of the pediatric exposures occurred at the child’s own home, 3% at another residence, and 1% each at school, in a public area, and at an unspecified site.

Twenty-one percent of the children were already at or en route to a healthcare facility when the poison center was contacted while the poison center managed 61% on site (that is, at home) and referred 18% to a healthcare facility. Ninety-one percent of the pediatric exposures were known or expected to have some sort of adverse effect, with an outcome suspected to be serious in 14% with no deaths reported. In contrast, of the 278 pediatric exposures to the more traditional laundry detergents reported to Texas poison centers during January 1-June 14, 2012, 72% were known or expected to have some sort of adverse effect with 4% suspected to be serious.

The most frequently reported symptom of exposure was vomiting, reported in 55% of the children, followed by cough (11%), nausea (9%), ocular irritation (7%), oral irritation (6%), and red eye (6%). Other symptoms reported in six or less of the children were cardiovascular (tachycardia), dermal (superficial burns, edema, erythema, irritation, rash), gastrointestinal (abdominal pain, diarrhea, throat ir-

REFERENCES

Drowning - Number One Cause of Accidental Death in Children 1-4 Years of Age

The Center for Disease Control and Prevention, (CDC), reports an average of 3,500 unintentional drownings each year for the past decade. This averages out to 10 drowning-related deaths per day. In Texas, up to 100 children die each year from drowning. Drowning is the number one cause of accidental death in children 1-4 years of age, and is second only to birth defects as a cause of death in this age range. Twenty-five percent of fatal drowning victims were children age 4 and under, and for every drowning fatality in this age range, another four children are treated in the emergency room for non-fatal submersion injuries. The good news is that most of these deaths are predictable and preventable.

One of the most dangerous combinations is unsupervised children and swimming pools. The most common drowning site is the at-home swimming pool because parents often do not take all the necessary precautionary measures to protect their children. The majority of the pool-related fatalities in children 1-4 years of age occurred when one or both parents were present, and the child had been out of the parent’s supervision for less than 5 minutes. According to the National Vital Statistics System and National Electronic Injury Surveillance System, nonfatal (45.5%) and fatal (37.1%) incidents occurred most commonly on weekends and during June–August, 57.5% and 46.7%, respectively.

Being aware of the risks and taking safety precautions are proven ways to prevent drowning injuries and deaths. The National Drowning Prevention Alliance (NDPA) suggests implementing the “layers of protection” approach. These layers include supervision, barriers for swimming pools, swimming lessons, preparing for emergencies, entrapment prevention and awareness of other types of water in the home.

Unlike the movies where drowning victims flail their arms and cry out for help, experts with the U.S. Consumer Product Safety Commission (CPSC) caution that children often drown “quickly and silently” without warning or time for someone to come to their aid. Learn the facts and take action to protect yourself and the ones you love from drowning.

- Barriers and supervision.
  Residential swimming pools were the leading cause of drowning-related deaths in children from one to four years of age. To prevent young children from accessing the pool unsupervised, surround a backyard pool with a fence at least 4 feet high on all sides, including the side next to the house. The fence should have a self-closing, self-latching gate that remains locked when the pool is not in use.

- Designate a responsible adult who can swim and knows CPR to watch swimmers in or around water – even when lifeguards are present. That adult should not be involved in any other distracting activity (such as reading, or talking on the phone) while watching children.

- Learn to swim. Formal swimming lessons can reduce the risk of drowning by as much as 88% among young children aged 1 to 4 years.

- Learn Cardiopulmonary Resuscitation (CPR). In the time it might take for lifeguards or paramedics to arrive, your CPR skills could save someone’s life.

- Alcohol use. Half of adolescent and adult swimming pool-related deaths involve alcohol use. Alcohol impairs judgment, influences balance and coordination and can combine with heat and sun to amplify effects. Refrain from alcohol use near swimming pools to avoid swimming pool injuries.

- Seizure disorders. For persons with seizure disorders, drowning is the most common cause of unintentional injury death. If you or a loved one has a seizure disorder, make sure swimming pool time is always supervised.

Reference: MMWR / May 18, 2012 / Vol. 61 / No. 19

Community Health Worker Training

Community Health Workers, also known as Promotoras or Navigators are gaining increasing recognition and respect for their role in meeting the health needs of medically underserved and linguistically isolated populations. CHWs frequently help clients locate a medical home access needed health care services. There is also increasing evidence that CHWs are helping traditionally underserved populations to successfully manage chronic diseases i.e. diabetes and asthma.

Thirteen Community Health Workers recently completed the 160 hour Core Curriculum Class offered by the University of Texas School of Public Health, DSHS certified CHW Training center. The University of North Texas, School of Public Heath and TAMHSC-SRP also provide continuing education and training to CHWs. Upcoming continuing education trainings include Your Health Matters: Nutritious Eating and Healthy Homes for CHWs.

For further information or to schedule onsite training for your organization contact Nancy Crider at nancy.m.crider@uth.tmc.edu; Cara Pennell at clpennel@srph.tamhsc.edu; or Jeffrey Moon at jeff.moon@unthsc.edu Texas Public Health Training Center website www.txphtrainingcenter.org

The mission of the TPHTC is to improve the state’s public health system by strengthening the technical, scientific, managerial and leadership competencies and capabilities of the current and future public health workforce. TPHTC provides face to face and online training to audiences across Texas. Grand Rounds hosted by local health departments keep public health practitioners engaged, challenged and up-to-date.
The Texas Public Health Association (TPHA) 88th Annual Education Conference was held in Arlington, Texas on March 21-23, 2012. The conference was attended by over 200 public health professionals from across Texas.

Many thanks go out to co-hosts the Tarrant County Public Health and the University of North Texas Health Science Center School of Public Health. Thank you to the Department of State Health Services (DSHS) – Center for Health Statistics for sponsoring the continuing education activities and to the DSHS Continuing Education Services Office. Appreciation is also given to the other sponsors and advertisers – Cancer Prevention Research Institute of Texas, University of Texas School of Public Health – Houston and the Texas Public Health Training Center. Also, TPHA would like to thank the Planning Committee and the many volunteers without whom the conference would not have been a huge success.

This years’ conference got off to a wonderful start with three excellent pre-conference workshops: “Applying Family History in Health Education”, Cost-Effective Resources for Emergency Preparedness” and “Group 5G: The Future of TPHA”. The conference highlight was the three plenary sessions which featured world class speakers and wonderful presentations at each. The plenary sessions are described below.

Opening Plenary
• State of Public Health in Texas – David Lakey, MD
• Healthy People 2020 – Eva Moya, PhD, LMSW

2nd Plenary Session
• Social Determinants of Health Disparities: Potential for Change in Public Health Practice – Ben G. Raimer, MD; Alexandra Nolen, PhD, MPH; Eva Moya, PhD, LMSW

Closing Plenary
• A Tale of Two Systems: A Reprise – Eduardo Sanchez, MD

The conference also offered 17 exhibits to view and 19 poster presenters to interact with throughout the three day event. There was also a variety of education activities through 21 concurrent breakout sessions.

Thursday evening the TPHA President Bobby D. Schmidt, M.Ed. hosted a wonderful event at the President’s Reception and Awards Presentations. Mr. Schmidt recognized individuals and groups for their dedication to TPHA and to public health. The awards are listed below.

• TPHA Fellow Award – Girls Inc. of Tarrant County 5G Corporate Camp Team
• Recognition of new Fellows-Raouf Arafat, MD., MPH, Lou Brewer, RN, MPH, Bing Burton, PhD., Debbie Flaniken, MA, Dean Lampman, MBA., Gloria McNeil, RN, BSN, MEd, Melissa Oden, DHeD., LMSW-IPR, MPH, CHES, Catherine Troisi, PhD
• Recognition of the Immediate Past President – Adriana Babiak-Vasquez, MPH

TPHA News and Information

Texas Public Health Association
88th Annual Education Conference
“Pitching Public Health: A Home Run for All”
Sheraton Arlington Hotel
Arlington, Texas
March 21-23, 2012

The Texas Public Health Association had its origin in the Texas Association of Sanitarians which was organized at Austin, Texas, November 16, 1923. On April 12, 1932, the constitution of the original association was rewritten and the organization was chartered under the name of the Texas Public Health Association.

The purpose for which the organization was formed is to promulgate public health knowledge or practice, or who has demonstrated genuine concern for the health needs of society. This year’s recipient Ben G. Raimer, M.D. embodies all of those characteristics.

Dr. Raimer is a long time member of TPHA. Dr. Raimer is the Senior
Vice President for Health Policy and Legislative Affairs at the University of Texas Medical Branch (UTMB) in Galveston, Texas. He is a Diplomate of the American Board of Pediatrics and a Fellow of the American Academy of Pediatrics. He holds an undergraduate degree in biology from East Texas Baptist University, a master’s degree in human genetics from the UTMB Graduate School of Biomedical Sciences, and a doctorate from the UTMB School of Medicine. Since completing an internship and residency in pediatrics at UTMB in 1977, he has provided community-based medical care to scores of young patients living in Galveston and neighboring counties. Much of his practice has been devoted to the evaluation and treatment of children and adolescents with behavioral disorders and learning disabilities. A nationally recognized expert on prevention and treatment of child abuse and neglect, he has been honored by several children’s advocacy organizations for his contributions. He also has extensive experience in correctional health care and telemedicine and has published numerous articles on these topics.

In addition to the many hats he wears at UTMB, Dr. Rainer serves on a number of advisory panels and committees for various government agencies and professional organizations, including the Texas Health Institute, chair of the Texas Health Disparities Task Force, and the Galveston County Health District United Board of Health. Dr. Rainer is the immediate past chairman of the Texas Statewide Health Coordinating Council. He has also served his local community as Galveston Chamber of Commerce executive board chair, chair of the Galveston Families, Children and Youth Board, and chair of Friends of Scouting.

The Honorary Life Membership Award

The Honorary Life Membership Award was presented to TPHA President Bobby D. Schmidt, M.Ed.

Mr. Schmidt has been a member of TPHA for over 20 years. He is a TPHA fellow and is the past-president of the Association. Mr. Schmidt has been a public health professional for over 30 years and has established himself as an expert in many areas of the profession. Most of his public health career involved the regulation of the environment, health facilities and licensed health care professionals. He also has been involved in providing direct health care as the executive director of a community health center in Nacogdoches, Texas and is currently the manager for the Health Provider Resources Branch in the Center for Health Statistics at the Texas Department of State Health Services.

He attended Southwest Texas State University and received a Bachelor of Science in Health Education in 1976 and later added a Master of Education in Health Education in 1998. He continues to be a mentor to young public health professionals and he has truly exemplified the principles for which the Texas Public Health Association stands for.

The PHAME Award

The Public Health Award for Media Excellence (PHAME) is given for outstanding communication efforts. The Texas media significantly advance community understanding and support for public health through their interpretation of issues affecting public health programs and problems in our state.

The 2012 Media Awards were presented to Abby Powell, KXII Sherman, Texas and Susan Schrock, Fort Worth Star-Telegram. Ms. Schrock received the PHAME Award (Public Health Award for Media Excellence). Ms. Powell had an on air expose entitled “Up close and Personal – Getting a Mammogram On-Air”. Ms. Powell used this educational story to evidence the importance of women having a yearly mammogram to prevent or assist in the detection of breast cancer. Ms. Schrock showcased the improvement of the infant mortality rates in Tarrant County through an education and prevention program. Her article was entitled “Infant Mortality Rates Improve”.

Legislator of the Year Award

This year two awards were given. One award to a member of the Texas Senate and one award to a member of the Texas House of Representatives. The awards were given to the Honorable Jane Nelson (Senate) and the Honorable Vicki Truitt (House), both represent Tarrant County.

Senator Nelson has been the chair of the Senate Committee for Health and Human services for many years. Her work to better the health of all Texans has been well documented.

Representative Vicki Truitt has served on the House Public Health Committee for many years. The Public Health committee considers issues of concern that affect the health and well-being of the citizens of Texas.

Legislators must have demonstrated an interest in public health issues, shown a concern for the recruitment and retention of high quality health care workers, supported legislation which emphasized prevention and health promotion, and facilitated legislation supporting preventive health care, health care professionals, and options of health care.

Call for NOMINATIONS for the 2013 TPHA AWARDS

All Nomination materials must be postmarked no later than January 15, 2013 and mailed to TPHA/Awards Committee, PO Box 201540, Austin, Texas 78720-1540. Awards will be presented at the TPHA Annual Conference in San Antonio during the President’s Reception and Awards Presentations event. Questions call TPHA at (512)336-2520 or email tspha@aol.com

HONORARY LIFE MEMBER

One of the greatest distinctions bestowed on a member of the Texas Public Health Association is that of Honorary Membership. Any active member may nominate a prospective candidate for Honorary Membership by writing to the Awards Committee. The following criteria are required of nominees for Honorary Membership:

• Must have been an active continuous member of TPHA for at least 20 years and must have attended ten or more annual meetings.
• Must have served the Association contributing to annual and regional meeting programs, holding office within the Association, and participating on Association committees.
• Supporting documentation such as letters from employers, individuals, public citizens or community groups, schools or colleges, or businesses; news clippings, photographs; journal articles; or other documentation pertinent to the nomination.

JAMES E. PEEVY MEMORIAL AWARD

The James E. Peavy Memorial Award is presented annually to the public health worker in Texas who has made significant contributions to the advancement of public health knowledge or practice or who
has demonstrated a genuine concern for the health needs of society. This award is the Texas Public Health Association’s highest accolade for outstanding health professionals; it consists of a $500.00 honorarium and plaque. The award serves as a living memorial to James E. Peavy, M.D., who served as Commissioner of Health in Texas from 1959 until his retirement in 1975. Dr. Peavy was an active member of the Texas Public Health Association for 39 years and was made an Honorary Member in 1969. The following criteria are required of all nominations:

- A 250-word (or less) description of why the nominee is deserving of this award. Descriptions should be concise and specific and should demonstrate the nominee’s work over and above job requirement.

- A one-page biographical sketch (or vita) of the nominee and a 4 x 5 glossy, black & white photograph of the nominee.

- No more than 10 pages of supporting documentation such as letters from employers, individuals, public citizen or community groups, schools or colleges, or businesses; news clippings; photographs; journal articles; or other documentation pertinent to the nomination.

- The nominee must be a member of TPHA. Nomination may be made by nominee or a sponsor. If nominated by a sponsor, sponsor must be a TPHA member and sponsor’s name must accompany the nomination.

**LEGISLATOR OF THE YEAR AWARD FOR LEGISLATIVE EXCELLENCE**

This award may be presented to both a state representative and state senator who has shown special interest in public health issues. Any active TPHA member may nominate a candidate for these awards. The following guidelines have been established for nominees of these awards; nominees must have:

- Demonstrated an interest in public health issues.

- Shown a concern for the recruitment and retention of high quality health care workers.

- Supported legislation which emphasized prevention and health promotion.

- Facilitated legislation supporting preventive health care, health care professionals, and options of health care.

**TPHA News and Announcements**

**TPHA Governing Council and Executive Board Actions**

The TPHA Quarterly business meetings were held at the TALHO offices on June 9. We thank TALHO for donating meeting space for this meeting.

The following action items were recorded during the June 9 meetings:

- **Governing Council**
  The March Governing Council meeting minutes were approved.

- **Legislative**-President Kaye Reynolds appointed Bobby Schmidt to chair the Legislative/Resolutions committee.

- **Membership**-Terri Pali reported 7 new members in the past month. We currently have 366 members.

**Site Selection**-The committee recommended St. Anthony-San Antonio as the host hotel for the 2013 annual conference. The governing council voted to proceed with contract negotiations.

**Program Planning**-the committee has identified tracks headings and points of contact for the annual conference sessions and identified general session speakers to be invited. The committee adopted ¡Viva! Public Health as the theme of the conference.

**Editorial Board**-The board continues to review articles for inclusion in the TPH Journal and is in discussion/negotiation with several groups for focus issues for 2013.

**Partnerships, Councils and Boards**

**Affiliated Representative to the Governing Council of APHA**

(APRG) Report-Catherine Cooksley reported that the APHA Executive Board voted to approve their proposal to change the name of the group from Committee on Affiliates to “Council of Affiliates”. Members attending APHA Annual Meeting in San Francisco, CA were encouraged to participate in Affiliates Day activities including the Affiliates Reception held Saturday evening, October 27th. She reminded the council that as the TPHA representative to the APHA Governing Council she will have an opportunity to vote on the APHA policy statements. She will be forwarding those to the TPHA governing council members for review and feedback.

**APHA Accreditation Grant**-President Kaye Reynolds reminded the council that TPHA was awarded a $4,000 grant to provide a conference on accreditation which will take place in Austin on September 24-25 at the UT Commons Bldg. The committee is developing a save the date flyer to be distributed in the next few weeks.

**APHA President-Elects Meeting**-Alex Garcia attending the APHA President-Elects meeting in Washington, DC. This was a great opportunity to meet other affiliate representatives and to learn about issues facing other state associations.

**Texas Public Health Coalition**-The Texas Public Health Coalition (TPHC) recently held its second public health forum to discuss Texas’ role in public health and safety, and economic stability. This session focused on immunizations and how they affect the physical and fiscal health of Texas. Staff members of Texas legislators and news media were invited to attend. The forum was held on Thursday, April 26, at the Texas Medical Association (TMA) building.

**Public Health Museum of Texas**-Carolyn Medina reminded us that the Texas Medical Association is hosting an exhibit, Don’t Spit on the Sidewalk! Poison the Rat! Cover Your Cough! Visit the exhibit to see how these and other 20th century public health campaigns have added an average 25 years to your life. Journey through the fights against disease, dirty water, spitting, smoking, contaminated food, filthy privies, poor diet, smelly city dumps, and early infant death. Guided tours available. The exhibit will be on display through September 2012.

**Unfinished Business**

The Texas Public Health Association will present the Texas HIV/STD Student Research Award to undergraduate and graduate students who make exemplary contributions to advance the understanding of HIV/STD epidemiology, disease transmission factors, risk populations and prevention and care efforts. The intent of the award is to promote the development, synthesis, and dissemination of scientific and scholarly knowledge unique to HIV/STD.
The Texas HIV/STD Student Research Award Selection Committee, appointed by the Texas Public Health Association, will review award applications and select the winners. The conference takes place October 28-31, 2012 in Austin, Texas at the Hyatt Regency.

Rachel Wiseman volunteered to represent TPHA at the Texas HIV/STD Conference to present the award.

The council voted to provide testimony to the Texas Department of State Health Services Public Health Funding and Policy Committee on June 26th. Bobby Schmidt will present the testimony.

Executive Board
The March Executive Board meeting minutes were approved.

Financial reports including the 2012 operating budget, co-sponsored events report and fund balances were presented.

The Executive Board voted on the following:

- approve up to $1,000 in scholarships pending receipt of qualified applicants and recommendation by the scholarship committee.
- to charge a fee for sponsors of AEC pre-conferences held during the TPHA annual education conference. The fee will cover the meeting room with a capacity of 75-100 people, publicity included in TPHA AEC publicity, coordination of continuing education, basic audio visual equipment (screen, microphone, LCD projector if needed), moderate food and beverage. Entities interested in sponsoring a pre-conference workshop should contact TPHA at txpha@aol.com for availability.
- accept donations earmarked for the APHA Affiliates Reception and to donate $200 from the TPHA general funds.
- offer TALHO complimentary ¼ page advertisement in the next 2 issues of the Texas Public Health Journal.

Terri Pali presented a report on options for new website/membership management programs. She will continue reviewing the various programs and bring a recommendation to the board at the next meeting.

TPHA Call to Leadership
TPHA is looking for dynamic new leaders and we need your help! Become a voice for public health in Texas. Harness the energy of public health advocacy-run for office in TPHA! We need nominees to run for the following positions:

Governing Council: 3 positions (3 year terms)

GOVERNING COUNCIL
4.01. There shall be a Governing Council which shall consist of the officers of the Association; the Executive Board; nine (9) members to be elected from the membership consistent with Article Two for three (3) year terms that are staggered so that one-third (1/3) retire each year; the Chair of each Section; one (1) representative to be appointed by each affiliated society; and the affiliate representative to the Governing Council of the American Public Health Association. Such representatives to Governing Council shall be members of the Association.

4.01.1. The President of the Association shall serve as Chair of the Governing Council.

4.02. The terms of the Governing Council members shall begin at the close of the annual meeting at which they are elected and terminate at the close of the annual meeting at which their respective terms expire.

Second Vice President
6.08. Second Vice-President/Membership: For nominations to the office of Second Vice-President/Membership, an individual shall be and Active Member in good standing for the preceding five (5) consecutive years, a current Fellow in the Association, a present or past member of Governing Council, and a participant in two or more annual meetings.

6.08.1. The Second Vice-President/ Membership shall oversee and be responsible for the Association’s memberships. (S)He shall function as an ex-officio member of the membership committee.

For more information about either the Governing Council or duties of the Second Vice President read these bylaws.

To nominate someone (can be yourself), obtain their permission to be placed on the ballot then submit their name and contact information to: Terri Pali TxPHA@aol.com fax: (512) 336-0533.

Nominees will be asked to submit a short biography along with statements of how they plan to carry out their duties and responsibilities. These documents will become part of the association records. The Committee on Nominations shall recommend a slate of officers to the Governing Council at the fall quarterly meeting. Elections will be held and results announced at the TPHA Annual Education Conference in San Antonio, Texas. Please consider this very important challenge to become a leader in TPHA!
TPHA AEC in Pictures
TPHA HONORARY LIFE MEMBERS

1948 V. M. Ehlers*
1949 George W. Cox, MD*
1951 S. W. Bohls, MD*
1952 Hubert Shull, DVM*
1953 J. W. Bass, MD*
1954 Earle Sudderth*
1956 Austin E. Hill, MD*
1957 J. V. Irons, ScD*
1958 Henry Drumwright
1959 J. G. Daniels, MD*
1960 B. M. Primer, MD*
1961 C. A. Purcell*
1962 Lewis Dodson*
1963 L. P. Walter, MD*
1964 Neil Faulkner*
1965 James M. Pickard, MD*
1966 Roy G. Reed, MD*
1967 John T. Warren*
1968 D. R. Reilly, MD*
1969 James E. Peavy, MD*
1970 W. Howard Bryant*
1970 David F. Smallhorst*
1971 Joseph N. Murphy, Jr.*
1972 Lola Bell*
1972 B. G. Loveless*

1973 Barnie A. Young*
1974 Ardis Gaither*
1975 Herbert F. Hargis*
1975 Lou M. Hollar*
1976 M. L. McDonald*
1977 Ruth McDonald*
1978 Maggie Bell Davis*
1978 Albert Randall, MD*
1979 Maxine Geeslin, RN
1979 William R. Ross, MD*
1980 Ed. L. Redford*
1981 W. V. Bradshaw, MD*
1981 Robert E. Monroe
1982 William T. Ballard*
1983 Mike M. Kelly, RS
1983 Hugh Wright*
1984 Hal J. Dewlett, MD*
1984 C. K. Foster
1985 Edith Ehlers Mazurek
1985 Rodger G. Smyth, MD*
1986 Helen S. Hill*
1986 Henry Williams, RS*
1987 Frances (Jimmie) Scott*
1987 Sue Barfoot, RN
1988 Jo Dimock, RN, BSN, ME
1988 Donald T. Hillman, RS*
1989 Marietta Crowder, MD
1990 Robert Galvan, MS, RS
1991 Wm. F. Jackson, REHS*
1992 Charlie Norris*
1993 T. L. Edmondson, Jr.
1994 David M. Cochran, PE
1995 JoAnn Brewer, MPH, RN*
1996 Dan T. Dennison, RS, MT, MBA
1997 Mary McSwain, RN, BSN
1998 Robert L. Drummond
1999 Nina M. Sisley, MD, MPH
2000 Nancy Adair
2001 Dale Dingley, MPH
2002 Stella Flores
2003 Tom Hatfield, MPA
2004 Janet Greenwood, RS
2005 Charla Edwards, MPH, RN
2006 Janice Hartman, RS
2007 Jennifer Smith, MSHP
2008 Catherine D. Cooksley, DrPH
2009 Hardy Loe, M.D.
2010 John R. Herbold, DVM, PhD
2012 Bobby D. Schmidt, M.Ed
*deceased

TPHA Life Members

Ron Anderson, MD
Minnie Bailey, PhD
Ned V. Brookes, PE
Oran S. Buckner, Jr., PE, RS
Burl Cockrell, RS

Exa Fay Hooten
Robert MacLean, MD
Sam Marino
Annie Lue Mitchell
Laurance N. Nickey, MD

Eduardo Sanchz, MD, MPH
David R. Smith, MD
Kerfoot P. Walker, Jr., MD
Alice V. White