Clinical Laboratory Workers
CLIAC Meeting, September 12, 2002

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National Center for Health Workforce Information and Analysis
Bureau of Health Professions
Health Resources and Services Administration
Mission: To increase health care access by assuring a health professions workforce that meets the needs of the public.

Functions

- Develop the health professions workforce through research, analysis, and planning
- Improve distribution and diversity of health professionals to rural/urban underserved areas
- Improve the quality of health professions practice and education
- Focus on key 21st century health professions issues (geriatrics, genetics, diversity/distribution)
Assuring an Adequate Health Care Workforce Requires:

Workforce Planning and Analyses\rightarrow To Train the Right People

High Quality Education\rightarrow The Right Skills

Equitable Distribution\rightarrow The Right places
National Center for Health Workforce Information and Analysis

• **Mission**: Collect, analyze, and disseminate health workforce information and facilitate national, State, and local workforce planning efforts.
  
  – Collect health professions-related data
  – Assist State and local workforce planning efforts
  – Conduct issues-related analyses
  – Conduct evaluations of health professions training programs
  – Develop tools and conduct research on the health workforce
More Than 1 in 10 Americans Works in Health Care or is a Health Professional

<table>
<thead>
<tr>
<th></th>
<th>Health Professionals</th>
<th>Other Workers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health service setting</td>
<td>8,642,749</td>
<td>4,098,331</td>
<td>12,741,080</td>
</tr>
<tr>
<td>Other work settings</td>
<td>2,167,418</td>
<td>126,649,685</td>
<td>128,817,103</td>
</tr>
<tr>
<td>Total</td>
<td>10,810,167</td>
<td>130,748,016</td>
<td>141,558,183</td>
</tr>
</tbody>
</table>

- Health professionals working in health service settings: 8,642,749 (6.1%)
- Health professionals working in other settings: 2,167,418 (1.5%)
- Other workers in health service settings: 4,098,498 (2.9%)

**US health workforce**: 14,908,498 (10.5%)

**US civilian labor force**: 141,558,183 (100.0%)

**Bureau of Labor Statistics, 2001**
Figures shown are the average of 12 months’ data (October 2000 – September 2001)
National Center for Health Workforce Analysis

Recent Products

- State Health Workforce Profiles
- Pharmacist Shortage Study
- GME Primer
- Comprehensive Health Workforce Profiles Pilot Project: 10 States
National Center for Health Workforce Analysis

Activities

- *State Health Workforce Profiles 2nd Edition*

- Health Workforce: Trends, Issues, and Supply and Demand Projections

- Supply, Demand, and Shortages of RNs

- Comprehensive Health Workforce Profiles Pilot Project: 8 Additional States
National Center for Health Workforce Analysis

Activities

- Supply and Demand for Nursing Aides and Home Health Care Aides
- Scope of Practice Laws and Effect on Access
- State GME Financing and Health Workforce Goals
- The Impact of Changing Demographics on Requirements for Health Care Providers
National Center for Health Workforce Analysis

Regional Centers for Health Workforce Studies

- University of California/San Francisco (UCSF) (http://futurehealth.ucsf.edu/cchws.html)
- State University of NY Albany (SUNY/Albany) (http://chws.albany.edu)
- University of Illinois Chicago (UIC) (http://www.uic.edu/sph/ichws)
- University of Texas Health Sciences Center at San Antonio (Coming Soon!)
National Conference of State Legislatures
Comprehensive Health Workforce Profiles Pilot Project: 18 States

In 2001 = CA, CT, FL, IL, IA, TX, UT, WA, WV, WI
In 2002 = CO, ME, MO, MN, NM, NY, OH, TN
Demand for Health Professionals Will Grow at Twice the Rate of All Occupations Between 2000-2010

<table>
<thead>
<tr>
<th>Total U.S Employment</th>
<th>2000 (000's)</th>
<th>2010 (000's)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Health Occupations</td>
<td>10,984</td>
<td>14,186</td>
<td>29%</td>
</tr>
<tr>
<td>Physicians</td>
<td>598</td>
<td>705</td>
<td>18%</td>
</tr>
<tr>
<td>Dentists</td>
<td>152</td>
<td>161</td>
<td>6%</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>217</td>
<td>270</td>
<td>24%</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>2,194</td>
<td>2,755</td>
<td>26%</td>
</tr>
<tr>
<td>Mental and Behavioral Health Occupations</td>
<td>518</td>
<td>657</td>
<td>27%</td>
</tr>
<tr>
<td>Therapists</td>
<td>479</td>
<td>639</td>
<td>33%</td>
</tr>
<tr>
<td>Public and Environmental Health</td>
<td>241</td>
<td>302</td>
<td>25%</td>
</tr>
<tr>
<td>Health Technicians and Technologists</td>
<td>2,459</td>
<td>3,090</td>
<td>26%</td>
</tr>
<tr>
<td>Health Service Occupations</td>
<td>3,197</td>
<td>4,264</td>
<td>33%</td>
</tr>
</tbody>
</table>

The Growth in the Number of Elderly Citizens Will Increase Requirements for Health Care Providers

The Number of Elderly Citizens is Growing Steadily in the United States

- Yellow: Population 65 thru 84
- Blue: Population 85 and older
National Center (SUNY Albany)
The Health Workforce: Trends, Issues, and Supply and Demand Projections

Source: Projections by Division of Nursing, BHP, HRSA, HHS, 1996
Pharmacists--Shortage?

Pharmacists per 100,000 Population: 1970-2000

Source: Bureau of the Census
Pharmacist Shortage—Rx Growth Rate

Source: IMS, 2000 (No. of prescriptions), HRSA/BHPr Pharmacist Supply Model (pharmacists)
Health Care Worker Shortages

• Registered nurses
• Direct care workers
• Clinical lab technologists and technicians
• Radiology techs
• Pharmacists
• Dentists
• Information system specialists
• Medical coders
Clinical Laboratory Workers

• Generally, clinical laboratory technologists hold a bachelor’s degree with a major in medical technology or in a life science

• Clinical laboratory technicians generally hold an associate’s degree or certificate

• Employment for both categories expected to grow

Clinical Lab Worker Job Growth

• Lab technologists and technicians held 295,000 jobs in 2000

• Half working in hospitals, remainder in labs, offices, physician clinics (some in blood banks, research and testing)

• Employment expected to grow 15% through 2010 (equal to other occupations)

Source: BLS
Job Growth Factors

• Technological advances: Dual effects
  – Additional diagnostic tests developed to increase demand
  – R&D simplifying routine testing, allowing for movement out of the laboratory setting

• Aging population with increased needs

• Need to replace workers who retire, transition to other fields

*Source: BLS*
Tasks of Medical Technologists

- Collect and prepare specimens
- Perform routine & specialized lab tests
- Recognize QC, instrument, data problems
- Train other lab personnel
- Communicate results to technical/lay people
- Participate in continuing education
- Recognize normal and abnormal values
- Correlate abnormal values with disease status

Survey data from certified MT (ASCP) Lab Medicine, 31(7), July 2000
Training: Medical Technologists (MT)
Baccalaureate Degree in MT or Biological Sciences with Training

- Hospital: 46%
- University: 45%
- Medical Center: 6%
- Other: 3%

Demographics: Medical Technologists

• 76% Female
• 97% Baccalaureate degrees (3% Grad/other)
• 58% Urban, 24% Suburban, 18% Rural
• 46% Married

Survey data from certified MT (ASCP) Lab Medicine, 31(7), July 2000
Demographics: Medical Technologists

- White: 69%
- Latino: 8%
- Asian: 9%
- Other: 1%
- Black/AA: 13%

Survey data from certified MT (ASCP) Lab Medicine, 31(7), July 2000
Medical Technologists: Specialization

• Clinical chemistry technologists
• Microbiology technologists
• Blood bank (immunohematology) technologists
• Immunology technologists
• Cytotechnologists
• Molecular biology technologists

Source: BLS
Training: Specialists in Blood Banking (SBB)

Baccalaureate Degree in Health Sciences, One Year Training Program

Medical Center
10%

Hospital
30%

Blood Center
40%

University
20%

Training: Cytotechnologists (CT)
Baccalaureate Degree and Completion of Accredited CT Program

- Hospital: 25%
- Medical Center: 39%
- University: 25%
- Comm College: 2%
- Other: 9%

Medical and Clinical Laboratory Technicians

- Perform less complex tests than technologists
- May prepare specimens and operate automated analyzers
- May also specialize
  - Histology technicians
  - Phlebotomists

Source: BLS
Training: Medical Laboratory Technicians (MLT)
Associate Degree, Completion of Accredited CLT/MLT or Certificate Program

- Comm College: 70%
- University: 11%
- Medical Center: 1%
- Hospital: 1%
- Other: 17%

Training: Histologic Technician (HT)
Baccalaureate Degree, Completion of Accredited HLT Program

Medical Center
16%

Hospital
31%

University
16%

Comm College
37%

Total Number of US Medical Laboratory Technologists and Technicians

Source: BLS
Accreditation

• National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
  – Medical/clinical technologists, technicians, histologic technologists/technicians, pathologists assistants
  – Programs in phlebotomy, cytogenetic technology, molecular biology, clinical assisting

• Commission on Accreditation of Allied Health Education Programs (CAAHEP)

• Accrediting Bureau of Health Education Schools (ABHES)
Licensure

• Licensure requirements vary by state

• Certification is voluntary, though required by many employers
  – American Society of Clinical Pathologists
    Board of Registry
  – American Medical Technologists
  – National Credentialing Agency for Laboratory Personnel
  – Board of Registry of the American Association of Bioanalysts
<table>
<thead>
<tr>
<th>Year</th>
<th>Medical Technologists</th>
<th>Medical Laboratory Technicians</th>
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<tbody>
<tr>
<td>1980</td>
<td>6,340</td>
<td>2,865</td>
</tr>
<tr>
<td>1985</td>
<td>5,085</td>
<td>2,447</td>
</tr>
<tr>
<td>1990</td>
<td>2,849</td>
<td>1,647</td>
</tr>
<tr>
<td>1995</td>
<td>3,217</td>
<td>2,120</td>
</tr>
<tr>
<td>1996</td>
<td>3,051</td>
<td>2,263</td>
</tr>
<tr>
<td>1997</td>
<td>2,760</td>
<td>2,001</td>
</tr>
<tr>
<td>1998</td>
<td>2,476</td>
<td>1,766</td>
</tr>
<tr>
<td>1999</td>
<td>2,216</td>
<td>1,395</td>
</tr>
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What Has Happened to All the Techs? Pennell C. Painter, Ph.D.
http://www.ivdtrials.com/TechStaff.htm
What Has Happened to All the Techs? Pennell C. Painter, Ph.D.
http://www.ivdtrials.com/TechStaff.htm
Medical Laboratory Technician and Techologist Training Program Declines.

Health Professions Education Programs: 1985-2000

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</tr>
</thead>
<tbody>
<tr>
<td>Medical Laboratory Technologists</td>
<td>584</td>
<td>420</td>
<td>357</td>
<td>255</td>
<td>-56.3%</td>
</tr>
<tr>
<td>Medical Laboratory Technicians</td>
<td>281</td>
<td>256</td>
<td>260</td>
<td>242</td>
<td>-13.9%</td>
</tr>
<tr>
<td>Total</td>
<td>865</td>
<td>676</td>
<td>617</td>
<td>497</td>
<td>-42.5%</td>
</tr>
</tbody>
</table>

Source: AMA, Health Professions Career and Education Directory
Number of Graduates Declining

![Graph showing the decline in number of graduates from 1995 to 2000 for different occupations.]

**Occupation % Change**
- Clinical Laboratory Techs. -29%
- Radiologic Technologist -14%
- Cytotechnologist -30%

Source: AMA, *Health Professions Career and Education Directory* (various eds.)
Total Enrollment in NAACLS and CAAHEP Accredited Programs

ASCP BOR Survey, 2001
Vacancy rates—a good measure of shortages

- In 2000, the vacancy rates for these disciplines exceed the average unemployment rate—typically about 5%--by two- to four-fold.

- Conversely, very high employment for new grads
  - Cytotechnologists 98%
  - Histologic Technicians 96%
  - Medical Laboratory Technicians 96%
  - Medical Technologists 96%
  - Specialists in Blood Banking 100%


Source: Lab Medicine 2001: 32(3) pp 124-138
**Washington State—Example of Shortages**

**Percent of Hospitals Reporting Difficulty Recruiting Personnel for Select Occupations**

- **Nuclear Medicine Technologists**: 91% overall, 88% urban, 100% rural
- **Ultrasound Technologists**: 88% overall, 92% urban, 82% rural
- **Licensed Pharmacists**: 75% overall, 87% urban, 96% rural
- **Radiation Therapy Technologists**: 71% overall, 77% urban, 84% rural
- **Radiographers/Radiology Technologists**: 63% overall, 77% urban, 100% rural
- **Medical Records Coders**: 54% overall, 55% urban, 53% rural
- **Medical Technologists**: 46% overall, 42% urban, 52% rural
- **Medical Laboratory Technicians**: 31% overall, 42% urban, 54% rural

* Of hospitals employing the position
Medical Technologists and Medical Laboratory Technicians

Median Annual Salaries, 2000[1]

<table>
<thead>
<tr>
<th></th>
<th>Medical Technologists</th>
<th>Medical Laboratory Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Settings</td>
<td>$40,518</td>
<td>$27,539</td>
</tr>
<tr>
<td>Office and Clinics of Medical Doctors</td>
<td>$38,854</td>
<td>$27,186</td>
</tr>
<tr>
<td>Hospitals</td>
<td>$40,851</td>
<td>$28,870</td>
</tr>
<tr>
<td>Medical and Dental Laboratories</td>
<td>$39,790</td>
<td>$25,251</td>
</tr>
</tbody>
</table>

Mean Annual Salaries, Medical and Clinical Lab Technologists (2000)

BLS Data
Salary data can help identify a shortage.

Median Annual Earnings of Select Health Occupations: 1983-2000

Clinical Lab. Workers
Radiologic technicians
Pharmacists
Physical therapists

Factors Affecting Labor Market

BLS predicts need for 120,000 new technicians and technologists between 2000-2010

Supply factors include

- Retirement of a large number of clinical laboratory technicians
- Individuals choosing more lucrative technical careers over clinical laboratory sciences
- Like nursing, which is also heavily a women dominated field, women now have more career opportunities and can choose better paying jobs
Increased Demand for Laboratorians

- Volume of tests expected to increase with population growth and the aging of population

- Technological advances and new tests

- Need to replace transitioning workers
Laboratorian Shortages: Reported Factors

- Salary levels
- Few opportunities for advancement
- Stressful working conditions
- Lack of visibility on the health care team
- Lack of a professional image
- Risk of infectious diseases
- Increased legal liabilities
Barriers to Addressing Lab Worker Shortages

• Diversity of professions and professional training, including training sites

• Lack of data on all laboratorians

• Difficulty in predicting technological changes

• Unknown usage of alternate workers (and ability to substitute)
Clinical Laboratory Sciences Personnel Shortage Study

2003

• Employment of clinical lab workers estimated at 295,000 in 2000
• Vacancies reported from 10% to 22%
• Employment projected to grow to 348,000 by 2010
• Study to assess supply, demand, and shortages of
  – Clinical Laboratory Scientists & Medical Laboratory Technologists
  – Histotechnologists
  – Histologic Technicians
  – Cytotechnologists
  – Pathologist Assistants
Key Questions to be Addressed

• How many lab workers will be needed, and where?

• How many will be formally trained?

• How many will come from alternate career paths/training?

• How are responsibilities affected by education/training?
Key Questions to be Addressed

• Where will supply fall short of demand?

• What are key factors influencing supply/demand now and in the future?

• What is the impact of a clinical lab worker shortage on the health care system?

• What are the recommendations of the clinical lab worker professions to address workforce?