Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community

Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community

Final Report
March 2012

GALLAUDET UNIVERSITY

R·I·T NATIONAL TECHNICAL INSTITUTE FOR THE DEAF

UNIVERSITY of ROCHESTER MEDICAL CENTER

ROCHESTER GENERAL HEALTH SYSTEM

Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community

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"Advancing employment opportunities and expectations for people with disabilities strengthens not only our economy, but our society. It creates a more inclusive America where every person is recognized for his or her accomplishments."

Kathleen Martinez
Assistant Secretary of Labor for Disability Employment Policy
U.S. Department of Labor
October 31, 2011

Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community

Vision 2022

By 2022, it is our vision that Deaf and Hard-of-Hearing (D/HH) individuals across the country will have levels of access to education, employment, and career advancement in a variety of health care occupations that match their skills and aspirations. Access will be fueled by improvements in health care-related educational and employment opportunities for D/HH individuals, employer awareness programs regarding the benefits of hiring and supporting D/HH employees, and the widespread use of innovative access technologies.

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Preface

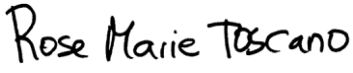
On behalf of the entire Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, we are pleased to submit this March 2012 *Final Report.* Along with the *Interim Report* published in June 2011, the Task Force now has completed its charge.

This Task Force is the product of an historic partnership among the National Technical Institute for the Deaf at Rochester Institute of Technology, Gallaudet University, the National Center on Deaf Health Research at the University of Rochester Medical Center, and the Rochester General Health System. Representatives from these four institutions worked with individuals from other academic centers and health care organizations for 18 months to gather and consolidate the data in this Report. Everyone connected to the project shares one unifying goal: a future in which our nation's health care workforce will reflect a dramatic increase in the numbers of competent, vibrant deaf and hard-of-hearing individuals contributing to the welfare of our country. This vision requires, among other things, a firm commitment to follow up on the Task Force recommendations detailed here. Only then can true and significant change occur.

We are honored to have co-chaired this unique effort. We found our fellow Task Force members to be creative, inspiring, organized, passionate, and forward thinking as we collectively brainstormed ways to create viable pathways to health care careers for deaf and hard-of-hearing individuals. We are especially thankful for the trust and encouragement of the founding institutions in supporting this initiative. Last, but not least, we thank the support staff and external contributors who made the task of bringing this *Final Report* to fruition that much easier.

While this *Final Report* marks the completion of the work done by the Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, it also marks the beginning of the "change" we hope to see, a change that involves renewed efforts to improve the career trajectories of deaf and hard-of-hearing individuals aspiring to health care careers. We look forward to the realization of the recommendations presented in this *Final Report,* as well as increased recognition that deaf and hard-of-hearing individuals deserve equal, barrier-free access to health care careers.

Professor Irene W. Leigh
Gallaudet University



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Trailblazers and Backbones

For Kellye Nelson, 42, of Laurel, MD, pursuing a career in health care has been a story in persistence, self-advocacy, and hard work.

Nelson was identified with a severe hearing loss at age 2 and, with the help of hearing aids, attended mainstream schools in Montgomery County, MD. There she used notetakers, one-on-one resource help, oral interpreters, and sat front-and-center in every class to better lipread her teachers.

"My parents and teachers believed in me and encouraged me in my endeavors," she says. "They never allowed me to dwell on my hearing loss."

As a senior in high school she received an award for outstanding accomplishments in education, leadership, and service. She was also featured in an educational book about communication and support for people who are deaf and hard of hearing.

At Spelman College in Atlanta, Nelson saw firsthand the value of deaf trailblazers. "I was the first deaf/hard-of-hearing individual to go there and at first the college was not receptive to providing support," she recalls. But her self-advocacy and example prepared Spelman for when the next deaf student enrolled. "During my junior year, a deaf freshman attended and the college did everything it could to make sure she received all the support and resources she needed…."

Nelson received a master's degree in Public Health from the University of Michigan and a B.S. in Nursing from Johns Hopkins University. She attributes her mother's support for giving her the confidence to pursue her health care dream.

"My mother was my number one supporter and she made sure I had the same opportunities as everyone else," she says. "I was sick a lot as a child with asthma and my mother died of breast cancer. I received and saw the excellent care that was given to me and my mother from the nurses and wanted to be able to help other people the same way."

Currently, Nelson is a Nurse Clinician at Johns Hopkins Hospital and also is a clinical instructor at the Johns Hopkins University School of Nursing.

"I really enjoy my job," she says. "It has been a very rewarding experience."

Despite her successful career and growing responsibility, and ever improving health care technology such as e-scope stethoscopes, Nelson still finds herself needing to assure people that she is up to the task, saying, "Usually, people assume that I can't do anything once they see the hearing aids."

She has learned to turn this experience into an opportunity. "Once I educate and tell them how they can help, people are usually receptive. I think you have to have a strong backbone in the health care field. Be open and willing to educate people about your disability and turn it into a positive."

Executive Summary

Deaf and hard-of-hearing (D/HH) individuals have made significant gains in many employment sectors since the passage of the Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990, as amended by the Americans with Disabilities Amendments Act of 2008. However, data from the U.S. Census Bureau show that only 5.8% of D/HH persons who are in the labor force work in the health care industry compared to 9.7% of hearing workers. In addition, data from the American Community Survey indicate that almost 25% of these 5.8% D/HH individuals are employed as aides in nursing, psychiatric, home health, and personal care areas. Almost 69% of these workers have less than a baccalaureate degree compared to 59% for hearing persons employed in similar jobs. This means that, not only are proportionally fewer D/HH persons employed in the health care professions, but when they are employed, they are in positions that require less education. Generally, D/HH workers are underrepresented in those health care occupations requiring higher degrees and overrepresented in those occupations requiring less education.

Unfortunately, stories of unsuccessful attempts by D/HH individuals to enter health care training programs and jobs are legion. A variety of reasons exist for this situation, including the lack of adequate educational opportunities (resulting in a lack of necessary academic skill development) for D/HH students interested in health care careers, as well as prevailing misunderstandings held by the general population and health care gatekeepers in education and industry about the potential for D/HH individuals to succeed. These misconceptions have contributed to lowered career expectations for these individuals; the perception of prohibitive communication barriers for persons who are D/HH; and the belief that D/HH health care providers cannot perform competently with hearing patients, clientele, or coworkers. These obstacles create the perception that potential D/HH health care workers are burdens instead of positive contributors in addressing national health care needs. These obstacles also contribute to training and employment disparities for D/HH individuals compared to the general population.

Generally, D/HH workers are underrepresented in those health care occupations requiring higher degrees and overrepresented in those occupations requiring less education.

Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Final Report is a call to action to rectify the historic underrepresentation and underemployment of

D/HH individuals in the health care industry. This call comes amidst dramatic projections regarding the need for increasing the health care workforce if our nation is to meet the growing health care demands of an aging and diverse citizenry. It also comes as the U.S. Department of Labor is actively urging the health care industry to reverse its record of poor hiring practices for persons with disabilities by increasing employment opportunities for this group.

This *Final Report* represents the culmination of the charge given to the Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, a national body comprised of deaf, hard-of-hearing, and hearing professionals representing postsecondary institutions and health care organizations throughout the country. The Task Force was established in June 2010 by four partners: the National Technical Institute for the Deaf at Rochester Institute of Technology, Gallaudet University, the National Center for Deaf Health Research at the University of Rochester Medical Center, and the Rochester General Health System. Its charge was to make recommendations that will increase career opportunities for D/HH individuals to enter and succeed in health care fields, countering an historic underrepresentation in health care careers, particularly in those requiring advanced education and training. The Task Force recommendations are guided by the following vision:

> By 2022, it is our vision that Deaf and Hard-of-Hearing (D/HH) individuals across the country will have levels of access to education, employment, and career advancement in a variety of health care occupations that match their skills and aspirations. Access will be fueled by improvements in health care-related educational and employment opportunities for D/HH individuals, employer awareness programs regarding the benefits of hiring and supporting D/HH employees, and the widespread use of innovative access technologies.

The vision of the Task Force is to ensure that D/HH individuals have expanded career opportunities in the health care field. The Task Force envisions a health care career "pipeline" for D/HH individuals that will facilitate entry to educational and career opportunities. This vision requires an astute understanding of the issues associated with the financial burdens of accessibility costs often incurred by educational institutions, health care facilities, and D/HH individuals themselves. It is a vision linked to ever-advancing technology that will enhance communication access and ensure full opportunity for D/HH individuals to develop the academic skills and experiences they need to gain entry to health care-related training programs. It also encompasses broad-based attitudinal changes needed to welcome D/HH individuals into training programs and employment settings without seeing hearing loss as a significant obstacle to employee productivity. Realizing this vision will require long-term commitment, ongoing involvement, and purposeful advocacy by the Task Force's four major sponsors, educational institutions throughout the country involved in health care training for D/HH students, state and federal agencies, health care employers, disability advocacy groups, and professional health care organizations. Progress will be grounded in our national commitment to equal educational and employment opportunities for all citizens, optimal economic contribution to society by each and every citizen, and workforce diversity.

Task Force Activities

The Task Force held nine meetings between September 2010 and March 2012. These meetings focused on: (1) reviewing educational and occupational demographics of the D/HH population; (2) collecting, collating, and summarizing information from three focus groups, 49 individual interviews, and significant commentaries from various constituencies regarding access to health care professions, sources of funding to support programming, and application of technology to support accommodations in education and the workplace; and (3) developing a set of interim recommendations as well as a comprehensive *Final Report*. In June 2011, as required by its charge (see Appendix V, p. 112), the Task Force published its preliminary findings and short-term recommendations that could be undertaken within a 12-month period in *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report* (Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, 2011). (See Appendix VI, p. 114 for a summary.) Recommendations were organized within the following categories:

Maximizing information dissemination *regarding health care careers for the D/HH community intended for D/HH students, their parents, educators, and other professionals working with D/HH individuals, gatekeepers in educational institutions, and health care employers.*

Enhancing educational curricula and training programs *to assist D/HH individuals in preparing for and obtaining employment in health care professions.*

Creating employer awareness *about the D/HH workforce, how access services and technological innovations can lower communication barriers, and how health care organizations can support the success of D/HH employees.*

Promoting improved access services for D/HH individuals *within school and workplace settings by supporting the identification and development of best practices with respect to specialized interpreting for D/HH individuals in health care fields and the increasing array of available technological applications.*

Initiating contact with relevant governmental agencies and creating a sponsored research/policy development committee *to ensure that the language of "eligibility criteria" for specific funding opportunities relevant to Task Force recommendations is inclusive of D/HH individuals and the institutions that serve them. The sponsored research/policy committee would ensure relevant research activity regarding instructional and curricular innovation related to health care preparation and professional development; technological advancements in the provision of access services related to health care preparation; and employment outcomes and career trajectories related to health care careers.*

These interim recommendations represent a critical intermediate step in fulfilling the Task Force's charge of increasing the numbers and success of D/HH individuals in health care careers. They also set the foundation for the more comprehensive *Final Report* recommendations included in this document. *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Final Report*, intended for the four partnering institutions as

well as for a broader audience of government agencies, educational institutions, and policy makers, envisions a 10-year action plan to achieve the stated goals. The goals and implementation recommendations focus on Ensuring High Quality and Innovative Access Services, Re-Envisioning Educational Experiences and Preparation, and Assuring Progress for D/HH individuals in Health Care Careers. To realize these goals and recommendations, the Task Force proposes four organizational engines that will anchor the 10-year action plan:

- **The National Center on Access Services Innovation and Consultation for Deaf and Hard-of-Hearing Health Care Students and Professionals (NCAS)** *will be a national information, research, and development resource supporting the continuing growth of innovative access services and assistive technologies tailored specifically to D/HH students and professionals in health care.*
- **The Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students** *will be a national educational resource for degree programs, internship/practicum experiences for D/HH individuals, educa- tional outreach, technical assistance, and research programs.*
- **The Sponsored Research/Policy Development Committee** *will be a collabora- tion among the four founding institutions focused on externally funded research and the resulting implications for policy development related, but not limited to, health care education, employment, and career advancement for D/HH individuals.*
- **The National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals (NAGHCC)** *will be a national entity supported by the four founding institutions and entrusted with providing the necessary focus to the founding institutions so that the short- and long-term recommendations are realized.*

Ensuring High Quality and Innovative Access Services

D/HH individuals still confront challenges that prevent them from having full access to health care professions. Among these are ensuring that the supply of interpreters who specialize in health care keeps up with demand as more D/HH individuals enter this field; minimizing institutional disincentives for educating and hiring D/HH individuals due to the cost of access services; and vigorously pursuing emerging technologies that can be used to provide required access services.

In the *Interim Report*, the Task Force recommended setting up a consulting health care access and communication information dissemination service, a technology lab for assessing assistive devices, and an equipment loan program for D/HH individuals who can test the suitability of specific equipment for educational or employment needs. As elaborated in this *Final Report*, this service should be formalized as a national consultation/technology development resource called **The National Center on Access Services Innovation and Consulta-**

tion for Deaf and Hard-of-Hearing Health Care Students and Professionals (NCAS). The functions of this National Center will be to:

1. *Provide guidance and consultation about interpreting services for D/HH students, D/HH employees, and employers in medical, health, and bioscience fields;*

2. *Provide consultation and information regarding currently available access services and assistive technologies in light of individual needs;*

3. *Provide guidance for D/HH students and professionals and the organizations that support them in crafting solutions for providing required access services and assistive technologies;*

4. *Sponsor partnerships among postsecondary institutions, private industry, and the federal government in the development, testing, and commercialization of emergent access services and assistive technologies;*

5. *Provide guidance and consultation for universal design compliance and principles for existing medical and health technologies that apply to D/HH individuals;*

6. *Generate certification standards and procedures, in collaboration with appropriate professional associations, regarding the provision of access. This resource also would generate certification standards and procedures regarding the provision of access services by interpreters and real-time, computer-aided transcribers in educational and professional health care settings, as well as technical standards regarding the capabilities of assistive technologies.*

To address the critical funding issues related to access services, the Task Force advocates that the four founding institutions develop and demonstrate successful strategies for funding required access services and assistive technologies so as to minimize institutional disincentives for educating and hiring D/HH individuals. These strategies will be shared nationally with other programs working with D/HH students and professionals in health care areas. Among the possible strategies to be investigated are:

1. *Establishing a collective compliance model similar to the Minneapolis/St. Paul Twin Cities Hospital Interpreter Consortium, which developed a local funding pool to divide communication access costs among stakeholders;*

2. *Partnering with legislators and policymakers to expand tax credits and deductions available for institutions and companies who hire D/HH health care workers;*

3. *Seeking the enactment of legislation creating a funding mechanism for Video Remote Interpreting (VRI) services parallel to the funding mechanism used for Video Relay Services;*

4. *Developing a project to test the viability of using VRI services at health, scientific, and educational centers;*

5. *Collaborating with organizations such as the National Association of the Deaf, Hearing Loss Association of America, and other organizations to set up a funding commission to investigate the feasibility of centralized access funds to cover costs considered to be "beyond burdensome" by institutions and employers;*

6. *Promoting the enactment of a requirement that all federal and state health, science, and engineering-related research grants include supplemental funds to ensure adequate accommodations for D/HH students, employees, and professionals;*

7. *Working with the Office of Vocational Rehabilitation to provide access services funding for D/HH individuals enrolled in professional health care education programs;*

8. *Promoting public and employer awareness about ADA-established responsibilities to provide accommodations to employees who are D/HH.*

Re-Envisioning Educational Experiences and Preparation

State and federal efforts in support of Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 have enabled D/HH students to attend the schools of their choice and obtain support. As a result, over the 38 years between 1972 and 2010, the percentage of D/HH individuals attending or graduating from college has increased by approximately 400%.

While these improvements are cause for celebration, the numbers of D/HH students pursuing bachelor's degrees continue to show disparities compared to the general population. In 2009, 60% of D/HH high school graduates attended some form of postsecondary education. Of these students, 57% attended two-year or less than two-year schools. This compares to 48% for hearing students. Only approximately 33% of D/HH students were pursuing bachelor's degrees compared to 47% of hearing students. Although comparable proportions of D/HH and hearing students pursue health care majors (10%-12%), there is a striking disparity in the attainment of terminal degrees. Further investigation shows that 63% of D/HH students majoring in health care fields pursued degrees or certificates requiring two years or less of preparation. In comparison, only 39% of hearing students in health care fields were studying at the two-year level. Clearly, these data demonstrate that D/HH individuals need better access to, increased awareness of, and better preparation for education and training opportunities that will enable them to pursue a wider spectrum of job opportunities in the health care and biomedical workforces.

> …the numbers of D/HH students pursuing bachelor's degrees continue to show disparities compared to the general population.

The Task Force envisions that by 2022, D/HH students throughout the nation seeking postsecondary education in health care-related fields will have greatly expanded options, anchored by a **Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students.** The CCOE will be a national educational resource

entailing degree programs as well as internship/practicum experiences for D/HH individuals

pursuing a wide range of health care professions, with multiple entrance and exit points spanning associate-level degrees through master's degrees and advanced graduate-level degrees. It will conduct research on program effectiveness and also provide educational outreach regarding academic preparation, career information related to health care fields, employer awareness programs, and technical assistance to other postsecondary institutions throughout the country serving D/HH individuals in health care majors. The CCOE's six goals will be to:

1. *Promote career awareness and academic skills development related to health care careers for middle and high school students;*
2. *Provide postsecondary educational preparation at a variety of degree and training levels;*
3. *Provide assistance to postsecondary institutions regarding policies and practices that ensure that admissions procedures for health care majors include fair consideration of D/HH applicants in conformance with ADA requirements;*
4. *Provide assistance to other postsecondary institutions serving D/HH individuals in health care majors on effective strategies for supporting the effective learning of D/HH students in health care educational settings;*
5. *Advocate for the linking of professional licensing and credentialing criteria to functional standards of professional competence as opposed to standards assuming or requiring a particular set of sensory or linguistic capabilities;*
6. *Enhance employer practices to support the success of D/HH health care employees.*

Specifically, the Task Force recommends that:

- *The four founding institutions explore securing support for extending Centers of Excellence (COE) to include D/HH representation through the Consortium Center of Excellence (CCOE) in Health Care Careers, which might include Gallaudet University, Rochester Institute of Technology /National Technical Institute for the Deaf, the University of Rochester, Rochester General Health System, and other local and national partners as designated. Specifically, the recommendation is to amend legislation authorizing the COE program to include Centers of Excellence for D/HH students comparable to the COE for certain Historically Black Colleges and Universities, Hispanic Centers of Excellence, and Native American Centers of Excellence; and/or to establish a separate COE program for schools serving D/HH students comparable to the current COE program as legislated.*
- *The CCOE work with institutions across the country to develop complementary programs and "pipelines" that will facilitate increased access to health career options for D/HH individuals. The CCOE will offer technical assistance to other national educational institutions regarding the preparation of D/HH individuals for health care professions. This assistance will include, but not be limited to, best practices in the*

development of Science, Technology, Engineering, and Mathematics (STEM) skills, academic support services, retention practices, accessibility options, and appropriate research findings.

- *The CCOE take the lead in modeling admissions processes for D/HH individuals that minimize bias and serve as a national example for other institutions around the country.*
- *The CCOE forge partnerships with the National Association of Nurses with Disabilities, Association of Medical Professionals with Hearing Losses, the American Medical Association, the American Psychological Association, the National Dental Association, and other pertinent national groups that may deal with bias and inequity issues in the licensing and credentialing of health care providers. These organizations can assist with developing specific strategies to encourage all health care educational institutions to re-evaluate and revise their standards in a functional manner.*
- *The CCOE gather and disseminate "best practice" experiences of employers who successfully integrate members of the D/HH community into health care careers and create a positive work environment.*
- *The CCOE, in collaboration with the already established Sponsored Research/Policy Development Committee, will:*

    - *Encourage the development of innovative educational programs and policies to improve academic readiness skills to facilitate the ability of D/HH students to enter health care professions;*
    - *Conduct and foster research and development of technologies, practices, and innovations that further the education of D/HH individuals in health care careers;*
    - *Maintain a database to assess and document the impact of practices, technologies, and CCOE-sponsored initiatives;*
    - *Collect research data on the design of educational programs using functional standards (as opposed to organic-based standards) to provide an evidence base for funding applications and develop strategies for collecting research data on the effectiveness of the change to more functional standards;*
    - *Address basic research questions relative to pedagogy, innovative access services, and assessment practices relative to D/HH persons in health care fields.*

Assuring Progress in Increasing the Number and Success of D/HH Individuals in Health Care Fields

The recommendations in this section emphasize strategies designed to ensure that D/HH individuals continue to advance within the health care system and that the initiatives undertaken by the four founding institutions make a sustained difference in the career trajectory

of D/HH persons. While the other recommendations have addressed policy and research aspects for access and educational initiatives, these recommendations are focused on facilitating the coordination of all Task Force implementation recommendations.

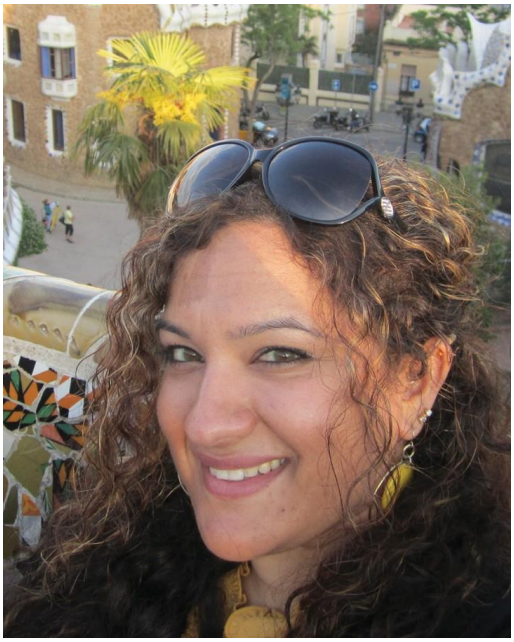
By 2012-13, a **National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals (NAGHCC)** will be formed through a partnership among the founding institutions and an appropriate national non-profit professional advocacy organization. This Group will include representation from other postsecondary institutions, the health care industry, and federal and state agencies. The Group's focus will be to advance the Task Force's long-term recommendations with respect to education, research, communication access services and related technological innovation, employer and public awareness, and policy reform. In addition, it will advise the four founding institutions on progress toward the short- and long-term recommendations, and assist, where possible, with advocacy in funding and policy support from local, state, and federal governments in carrying out the Task Force's recommendations. The National Advisory Group on Health Care Careers will receive regular reports from all existing entities responsible for implementation of Task Force recommendations, namely the National Center on Access Services Innovation and Consultation for Deaf and Hard-of-Hearing Health Care Students and Professionals, the Consortium Center of Excellence in Health Care Careers for Deaf and Hard-of-Hearing Students, and the Sponsored Research/Policy Development Committee; and will work closely with appropriate staff at the four institutions to advise on best strategies for accomplishing Vision 2022.

Conclusion

Throughout its 18 months of research, inquiry, and discussion, the Task Force repeatedly saw the limitations and barriers often imposed on D/HH individuals in the health care fields. In spite of these obstacles, some D/HH individuals have succeeded as medical doctors, nurse practitioners, lab technicians, medical records technicians, pharmacists, dentists, oral hygienists, research scientists, and psychologists, among others. These success stories do not mirror the experience of most D/HH individuals. They do, however, reveal the possibilities if we create opportunities for this population. The Vision, Goals, and Implementation Recommendations of this *Final Report*, together with the Task Force's *Interim Report,* propose a paradigm shift that will culminate in increasing the diversity of our national workforce in health care fields. More important, these initiatives ensure the fullest economic return to society on the part of D/HH citizens and uphold our national commitments to civil rights and social justice.

…this Final Report, together with the Task Force's Interim Report, proposes a paradigm shift that will culminate in increasing the diversity of our national workforce in health care fields.

Making It Despite Odds



Shazia Siddiqi, 32, was raised in Southern California, and was identified with profound hearing loss when she was 3 ½ years old.

Siddiqi was a voracious reader and her parents helped her after school to make sure she kept up with her hearing peers. With this support, she took honors courses and became valedictorian of her high school's senior class.

"I was always fascinated with science--especially genetics in Biology, which started in the 9th grade--because I wanted to find out how I became deaf," she says.

Siddiqi was accepted to the University of California, Berkeley on a full scholarship, but Science courses there were a struggle because of the difficulty of following higher-level terminology. She asked several times for a real-time captionist, but did not receive one until her senior year.

She graduated with a bachelor's degree in Molecular and Cell Biology.

During her senior year at Berkeley, Siddiqi read an article about deaf doctors and became interested in studying medicine. Before that, she had assumed such a career was closed to her.

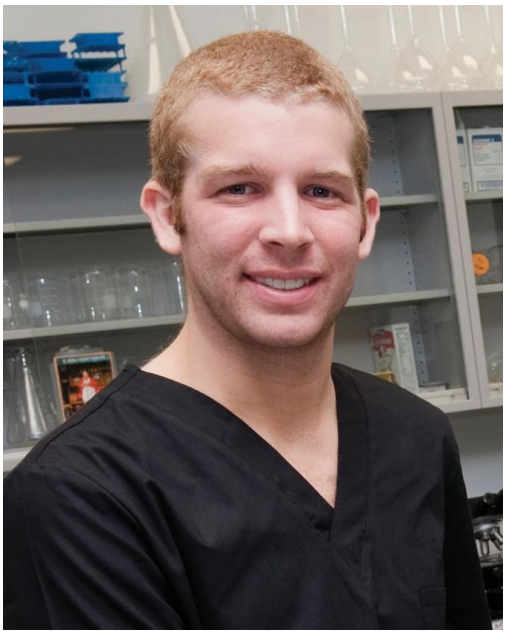
"I thought it was possible when I saw others were doing it," she says. "I strongly believe in having positive deaf role models in the health care fields to show students they can do it."

Using interpreters and remote live captioning, Siddiqi earned a master's degree in Public Health from Dartmouth College. She worked as a community health educator for children in Los Angeles and then was accepted to St. George's University School of Medicine in Grenada, West Indies.

Looking back on her experience, Siddiqi highlights the importance of support and, most crucially, strong role models.

"I would highly recommend deaf children have extra tutoring if needed, and early exposure to health care careers beginning in middle school," she says. "I didn't realize I could do it until I was in college."

Discrimination: The Biggest Obstacle



Andrew Donald, 21, of Middletown, MD, is a fourth-year Biomedical Sciences student at Rochester Institute of Technology. His dream is to become a dentist, but he worries about the discrimination he may face. Donald was born to deaf parents and was identified as deaf when he was 1 year old.

"Ever since I was little, I wanted to be a dentist," he says. "I always look at people's smiles when I meet them. Smiles inspire me a lot. I feel that smiles play an important role for inspiring people in many ways."

But Donald wonders if attitudes toward deafness may prevent him from furthering his education.

"Science and math are my favorite subjects," Donald says. "I enjoy human anatomy and biology. But I am very concerned about getting into a graduate school, having them provide an interpreter. I'm very concerned about the attitude of a dental school toward me and other deaf students who are Deaf-cultured and fluent in ASL. I have been questioning myself about the discrimination."

Currently, he receives access services from RIT's National Technical Institute for the Deaf, including American Sign Language interpreters in his classes. But he fears that graduate schools will not want to pay for interpreters.

As a second option, Donald is considering applying to business school, which could be easier for someone who is deaf, he believes.

Last year, Donald shadowed a deaf dentist in Maryland and learned a lot about communication issues. The mentorship left him confident he could communicate with patients.

"I have figured out a few methods to overcome those obstacles – I could type and have a computer voice for me, or get an assistant to help interpret. Patients would prefer good quality of care with a different communication method than receive poor work with good communication."

"But I'm not concerned about that now," he adds. "I'm concerned about getting into dental school."

He debates when would be the best time to tell a potential graduate school that he is deaf.

"Discrimination is the biggest obstacle," he concludes. "I don't want them to reject me because I am deaf."

Chapter 1
Introduction

I identified my hearing loss in half of the cover letters that I submitted [to clinical psychology doctoral internship sites], and omitted this information in the other half. Cover letters that I included my hearing loss in resulted in denials of an interview every time. The half where I didn't mention it yielded an invitation every time. (Christen Szymanski, Psychologist, 2010)

I have noticed some reservations in including a deaf person in the health care force personnel. My inability to secure a place for over two years now is indicative that the job market, though ripe for pharmacists, is not receptive to the idea of a deaf pharmacist. (Adebowale Ogunjirin, Pharmacist, 2011)

…Less than a year ago now, I had a [deaf] student that went through my class and was accepted into a chiropractic program. About six weeks after he received his acceptance letter… he was going through all the final preparations to attend school in the fall … they revoked his admittance and wrote him a very legal letter stating that it was not in the best interest of the patients to have a deaf chiropractor based on the idea that, even with an interpreter, he wouldn't be able to respond fast enough if something was going wrong during treatment. He was crushed. He's one that has always gone through barriers with a big, cheery grin sort of idea, and now it really put him in a tailspin. I just received an e-mail from him last week saying he's moved on and he's doing lab tech work now, but it really – it really changed career paths for him. (Dr. Sandra Connelly, Assistant Professor, Biological Sciences, Rochester Institute of Technology, 2010)

Background

Deaf and hard of hearing (D/HH) individuals have made significant gains in many employment sectors since the passage of the Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990, as amended by the Americans with Disabilities

Amendments Act of 2008. But, as the vignettes above and numerous studies illustrate, difficulties still exist for this group in the health care arena. According to data from the American Community Survey (U.S. Census Bureau, 2010a), only 5.8% of D/HH persons (170,000) who are in the labor force work in the health care industry as compared to 9.7% of hearing workers (12,000,000) who have jobs in the health care industry.

In addition, data from the American Community Survey (see Table 1, p. 68) indicate that almost one quarter of the 5.8% of D/HH individuals in health care occupations are employed as aides in nursing, psychiatric, home health, and personal care areas. Only 16% of hearing individuals are employed in these occupations. Fewer D/HH individuals also are employed as registered nurses (17% versus 20%). Only 4% of D/HH persons in the field of health care are physicians or surgeons, compared to 6.2% of hearing individuals. More specifically, almost 69% of D/HH health care workers (out of the 5.8%) have less than a baccalaureate degree. Compared with 59% for hearing persons, this means that not only are proportionally fewer D/HH persons employed in the health care professions, but when they are employed, they are in positions that require less education (see Figure 1, p. 81). Unquestionably, D/HH workers are underrepresented in the health care industry in general, and specifically in professional health care occupations, while they are overrepresented in those occupations requiring less education.

"…Bureau of Labor Statistics show stark disparities facing working-age individuals with disabilities, with 79.2% outside the labor force altogether, compared to 30.5% of those without disabilities."

Further support for the disparity that exists in the health care industry relative to D/HH individuals comes from a recent U.S. Department of Labor Office of Federal Contract Compliance Programs (2011) press release, which emphasized that the rates of hire for persons with disabilities remains very low. The current employment climate was described in this way: "Although Section 503 regulations have been in place for decades, the current unemployment rate for people with disabilities is 13%, 1 1/2 times the rate of those without disabilities. Even more discouraging, data published by the department's Bureau of Labor Statistics show stark disparities facing working-age individuals with disabilities, with 79.2% outside the labor force altogether, compared to 30.5% of those without disabilities." In fact, within this report, the Department of Labor is soliciting commentary on new regulations that would mandate federal contractors and subcontractors to set a hiring goal of having 7% of their workforce comprised of persons with disabilities.

It is reasonable to assume that the lack of employment opportunities for D/HH individuals, particularly those with significant hearing losses (in contrast to those with milder hearing losses), parallels the larger unemployment/underemployment picture described by the Department of Labor. In its 18-month study of the issues surrounding D/HH employment in health care careers, the Task Force has learned (anecdotally) that individuals who have significant hearing loss struggle with even higher rates of unemployment and underemployment. Unfortunately, existing data fails to permit analysis of the impact more significant hearing loss has on educational achievements, admission to health care programs, employment rates, and promotion rates.

As D/HH individuals struggle to enter the health care industry, jobs in this area are going unfilled. As reported by the U.S. Bureau of Labor Statistics (2010), the health care industry as a whole is projected to increase 22% through 2018 compared to 11% for all other industries. Employee shortages in various health care sectors are predicted to continue, with expectations of growth in multiple health care areas (see Table 2, p. 71), requiring innovative approaches to address these shortcomings (Kliff, 2011). The industry will generate 3.2 million new jobs between 2008 and 2018, more than any other employment sector, largely in response to rapid growth in the elderly population. In addition, 10 of the 20 fastest growing occupations are related to health care. The variety of jobs possible in the health care field is extensive (see Table 3, p. 74). There are plenty of choices for qualified and trained individuals. The industry itself acknowledges that it must expand its labor pool by increasing the number of underrepresented minority health care workers (Nesbitt, 2008). This calls for attention to D/HH individuals as a critical component of this effort.

…disability no longer can be viewed solely through the lens of the medical model, which focuses mainly on the impairment (e.g., hearing loss) and subsequent activity limitations, but rather should be viewed primarily in terms of a social model, whereby individuals are disabled by their environment.

Stories of unsuccessful attempts by D/HH individuals to enter health care training programs and jobs are legion. A variety of reasons exist for this situation, including the lack of adequate educational opportunities (resulting in a lack of necessary academic skill development) for D/HH students interested in health care careers (Walter, 2010), as well as prevailing misunderstandings held by the general population and health care gatekeepers in education and industry about how D/HH individuals function. Such attitudes lead to lowered career expectations for these individuals (see Chapter 2); the perception of prohibitive communication barriers for persons who are D/HH (e.g., Buchanan, 1999; Szymanski, 2010); and a pervasive belief that D/HH health care providers cannot perform competently with hearing patients, clientele, or coworkers. These obstacles create the negative perception that potential D/HH health care workers are burdens instead of positive contributors to national health care needs. These obstacles also contribute to training and employment disparities for D/HH individuals as compared to the general population, as noted earlier.

Creating a Paradigm Shift

Increasing the number and success of D/HH individuals in health care will require an orientation that focuses on solutions to barriers and new opportunities geared toward minimizing individual discrimination and promoting greater social diversity, and in turn, social good. This follows the basic idea that disability no longer can be viewed solely through the lens of the *medical* model, which focuses mainly on the impairment (e.g., hearing loss) and subsequent activity limitations (e.g., can't hear body sounds with conventional stethoscopes), but rather should be viewed primarily in terms of a *social* model, whereby individuals are disabled

by their environment (e.g., environmental and/or access barriers to education and gainful employment) (World Health Organization, 2001). Solutions for creating environments that promote equal opportunity for all persons with and without disabilities (i.e.,universal design-http://www.buffalostate.edu/disabilityservices/glossary.xml) should be a goal of both health care education and the health care industry. The result will be increased productivity in environments where all individuals will interact and function fully.

Multiple benefits can be derived when diverse populations are included as health care service providers, most particularly in terms of improved access to care for underserved patients, more choices for patients, greater satisfaction in terms of service delivery, better patient-provider communication, and better educational experiences for all those being trained within the health care arena (Smedley, Butler, & Bristow, 2004). While the researched benefits are shown only for ethnic minorities, we can easily extrapolate these benefits to include D/HH individuals. We propose that a diverse population of health care providers, including those who are D/HH, enriches the health care environment by introducing to non-deaf providers new strategies for communicating with their patients. D/HH individuals may have the unique ability to attend to the communication needs of both their deaf and hearing patients by incorporating methods that are not classically taught in traditional medical education. Christopher Moreland, a San Antonio-based doctor who is Deaf and the physician representative for the Association of Medical Professionals with Hearing Losses, is working on a study of physicians who are deaf and hard of hearing. He says that, in his experience, "Deaf people are highly attuned to visual, nonverbal behaviors, a quality which lends itself well to healthcare-related interviews. While the words are important, equally important is observing how a person expresses those words, in particular picking up on hints that something has been left unspoken" (Reade, 2009, p. 112).

…D/HH individuals may have the unique ability to attend to the communication needs of both their deaf and hearing patients.

Aside from working with hearing patients, D/HH clinicians also will have unique skills for a D/HH population. McKee, Barnett, Block, and Pearson (2011) demonstrated that the use of ASL-fluent clinicians correlated to higher rates of utilization of preventive services by deaf respondents and the use of medical preventive services. This finding suggests the importance of training D/HH health care providers who are fluent in ASL in the interest of addressing health issues for D/HH patients and presumably lessening health care costs through prevention and face-to-face communication. Overall, D/HH health care providers would be poised to work with all types of patients, hearing and deaf, a benefit to the entire health care system.

The American Community Survey (ACS) (U.S. Census Bureau, 2010a) is a nationwide survey of population and housing information, conducted annually by the U.S. Bureau of the Census. This survey offers communities a fresh look at how they are changing. Since 2008, the ACS has asked respondents whether they are "deaf or have serious difficulty hearing." Asking this question permits estimation of the number of persons who are D/HH in the U.S population. According to these data, about 3.5% of the U.S. population has some serious difficulty hearing (Table 4), with the majority of these individuals being 65 years of age or older. On the other end of the age spectrum, less than 1% of school-age children (about 337,000) are D/HH, with there being about 240,000 D/HH individuals between the ages of 19 and 25: a major target audience for the recommendations made in this report. These recent estimates are very similar to the estimates reported by Mitchell (2006), who used the Survey of Income and Program Participation (SIPP) as a base for his analysis. All things being considered, the population of D/HH individuals targeted by the recommendations in this report is estimated at about 1.1 million individuals between the ages of 16 and 44.

Table 4 Numbers of D/HH Persons as a Proportion of the U.S. Population by Age Group

Age Group	U.S. Population	Number D/HH	% D/HH
0-5	24,205,204	126,318	0.5%
6-18	54,638,735	336,926	0.6%
19-25	30,489,768	240,201	0.8%
26-44	77,898,920	883,232	1.1%
45-64	81,667,688	2,922,278	3.6%
65 +	40,449,374	6,316,740	15.6%
Total	309,349,689	10,825,695	3.5%

Source : U.S. Census Bureau (2010b)

Other demographic characteristics serve to make the D/HH population different from the general U.S. population, namely, the distribution of gender and ethnicity. It has long been known (Schein & Delk, 1974) that there is a higher percentage of males in the population of individuals who are D/HH than in the hearing population of the U.S. According to the ACS (U.S. Census Bureau, 2010a) about 56.8% of the D/HH population is male, while only 48.9% of the hearing population is male.

Likewise, Schein and Delk (1974) reported higher incidences of deafness among the White population than among the African American/Black or Asian American population. These differences continue to exist in the contemporary analysis using the ACS (U.S. Census Bu-

reau, 2010a). Table 5 shows that about 74% of the hearing population of the U.S. is White (including those Latinos who consider themselves White) while almost 85% of the D/HH population is White. African American/Black, Asian, and some ethnic groups are reported as having significantly fewer persons who are D/HH.

Table 5 Ethnicity of the D/HH Population and the Hearing Population of the U.S.

Ethnicity	D/HH	Hearing
White alone (including those Latinos who consider themselves White)	84.6%	73.8%
Black or African American alone	7.9%	12.8%
American Indian alone	0.8%	0.6%
Alaska Native alone	0.1%	0.04%
American Indian and Alaska Native and no other races	0.2%	0.2%
Asian alone	2.4%	4.8%
Native Hawaiian and Other Pacific Islander alone	0.1%	0.2%
Some other race alone	2.2%	4.9%
Two or more major race groups	1.8%	2.7%

Source: U.S. Census Bureau (2010b)

The kinds of support required by D/HH students and professionals in the health care field may vary considerably because D/HH individuals can be represented in multiple ways (Leigh, 2009). Hearing loss, as measured in decibels (dB, a unit of measurement of sound intensity), can be described as mild (26-40dB), moderate (41-55dB), moderately severe (56-70dB), severe (71-90dB), or profound (>90dB) (Clark, 1981, as cited in Diefendorf, 1997, p. 9). Depending on an individual's familial, educational, and individual preferences, a person who is D/HH may choose to use a variety of communication strategies regardless of the severity of the hearing loss. Thus, an individual may use American Sign Language (ASL)[1], speechreading, writing, transcription services, or a combination of these strategies to receive information. Likewise, D/HH individuals may choose to speak, write, or sign when conversing. They may or may not choose to use various types of assistive amplification, including cochlear implants, to supplement hearing. As a result, D/HH individuals use multiple labels to identify themselves, including the terms culturally Deaf, oral deaf, hearing impaired, hard of hearing, or late deafened (see Appendix I: Terms and Abbreviations, p. 83 for definitions) (Leigh, 2009).

[1] Best estimates for those relying on the use of ASL or some variant of signing number approximately 500,000 based on a 1974 population study with subsequent extrapolations of possibly greater numbers related to the growth of the population with hearing loss (Mitchell, Young, Bachleda, & Karchmer, 2006).

We have briefly described the diversity of the D/HH population so that readers of this report will understand and appreciate some of the elements comprising this diversity. Solutions and interventions designed to facilitate optimal educational and career development for D/HH individuals cannot rely solely on simple, one-size-fits-all models. The demographic, auditory, behavioral, educational, and social characteristics must all be addressed when proposing and implementing any solutions. Data collected on D/HH populations to date do not provide enough detail on subpopulations within the D/HH category to define categorically what approaches work for whom. Because of this lack of data and the inherent diversity as described above, accommodations typically have been determined on a case-by-case basis.

Establishment of the Task Force

In response to the significant educational, employment, and access disparities that exist for D/HH individuals in the health care industry and a national demand for more skilled health care professionals, Gallaudet University (Gallaudet), the National Technical Institute for the Deaf at Rochester Institute of Technology (RIT/NTID), the National Center on Deaf Health Research (NCDHR) at the University of Rochester Medical Center (URMC), and the Rochester General Health System (RGHS) formed the Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community in June 2010. Representatives from these four primary partners, as well as from postsecondary institutions, and individuals affiliated with health care organizations across the country, were members of the Task Force. The Task Force's mission was seen as critical to ensure that D/HH individuals, with appropriate support, enter and succeed in health care careers as well as avoid the "glass-ceiling effect" that often confronts D/HH employees.

> I'm trying to convince my hospital to get videophones so I can become a supervisor on the evening shift using the current technology. I do some chemistry work and primarily work in the hematology department. The use of a videophone will allow me to be more independent in contacting the providers, which requires a lot of contact with doctors, emergency service professionals, and the ICU department (related to patient services). They have not allowed me to date to become a supervisor because of the telephone communication barrier. I am also the only one on the shift with a master's degree in Health Systems Administration. (Elizabeth Hazelwood, Medical Laboratory Technologist, 2010)

The charge of the Task Force was to provide recommendations that will increase career opportunities for D/HH individuals to enter and succeed in a variety of health care professions (see Appendix V, p. 112). The Task Force held nine meetings between September 2010 and March 2012. These meetings focused on: (1) reviewing educational and occupational demographics of the D/HH population; (2) collecting, collating, and summarizing information from three focus groups, 49 individual interviews, and significant commentaries from various constituencies regarding access to health care professions, sources of funding to support programming, and application of technology to support accommodations in education and the workplace; and (3) developing a set of interim recommendations as well as a comprehensive *Final Report*.

In June 2011, as required by its charge, the Task Force published its preliminary findings and short-term recommendations that could be undertaken within a 12-month period in *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report* (Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, 2011). Recommendations were organized within the following categories:

> ***Maximizing information dissemination*** *regarding health care careers for the D/HH community intended for D/HH students, their parents, educators, and other professionals working with D/HH individuals, gatekeepers in educational institutions, and health care employers.*
>
> ***Enhancing educational curricula and training programs*** *to assist D/HH individuals in preparing for and obtaining employment in health care professions.*
>
> ***Creating employer awareness*** *about the D/HH workforce, how access services and technological innovations can lower communication barriers, and how health care organizations can support the success of D/HH employees.*
>
> ***Promoting improved access services for D/HH individuals*** *within school and workplace settings by supporting the identification and development of best practices with respect to specialized interpreting for D/HH individuals in health care fields and the increasing array of available technological applications.*
>
> ***Initiating contact with relevant governmental agencies and creating a sponsored research/policy development committee*** *to ensure that the language of "eligibility criteria" for specific funding opportunities relevant to Task Force recommendations is inclusive of D/HH individuals and the institutions that serve them. The sponsored research/policy development committee would ensure relevant research activity regarding instructional and curricular innovation related to health care preparation and professional development, technological advancements in the provision of access services related to health care preparation, and employment outcomes and career trajectories related to health care careers.*

These interim recommendations represent a critical intermediate step in fulfilling the Task Force's charge of increasing the number and success of D/HH individuals in health care careers. These recommendations also align with the U.S. Department of Labor's Office of Disability Employment Policy (ODEP), whose 2011 theme was: "Profit by Investing in Workers with Disabilities" (U.S. Department of Labor, 2011). The goal was to inform the public of the talent and skills that persons with disabilities provide in the workplace. This office supports several ongoing programs that help employers find qualified applicants with disabilities. In her reflections on disability employment, Kathleen Martinez (2011), Assistant Secretary of Labor for Disability Employment Policy, reports that the employment of people with disabilities is one of the last great frontiers in advancing civil rights, since the percentage of this group in

…the employment of people with disabilities is one of the last great frontiers in advancing civil rights, since the percentage of this group in the workforce is so low.

the workforce is so low. Currently, ODEP's goal has moved beyond the question of whether people with disabilities *can* work to a focus on effective strategies that facilitate work. As Martinez states, following up on this strengthens not only our economy, but also our society.

To reinforce this approach, particularly with reference to health care careers, the Department of Labor, for example, collaborated with Access Living of Metropolitan Chicago to organize a May 2011 summit on *Health Care: Career Trends, Best Practices & Call-To-Action* (U.S. Department of Labor, Office of Disability Employment Policy, 2011). This summit was a "call to action" for the health care industry to increase employment opportunities for people with disabilities and was aimed at key employers, academic institutions, government representatives, union officials, and national disability leaders. More specifically, the goal was to build strategic alliances and sustainable partnerships with industry leaders in order to achieve more widespread adoption and implementation of initiatives for employing people with disabilities. Within this context, attention to the educational and employment needs of D/HH individuals who are interested in health care careers is extremely timely.

Pictured above are (from left): Kathleen Martinez, Assistant Secretary of Labor for Disability Employment Policy; Hilda Solis, Secretary of Labor; Irene W. Leigh, Task Force Co-Chair; Rose Marie Toscano, Task Force Co-Chair; and Patricia A. Shiu, Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor.

Toward the Next Phase: Rationale for the Final Report

The Task Force believes that barriers facing D/HH individuals in the health care industry can be overcome. We want to recognize and enhance the potential of D/HH individuals to reduce the shortage of health care professionals in the burgeoning health care industry. We want to direct the focus to "Deaf-gain" as opposed to "hearing loss," a concept that views being deaf not as a lack of hearing but rather a gain in terms of living within a visual-spatial context that contributes to the richness of human diversity (Bauman & Murray, 2010). And we want to invoke our national principles of social justice, civil rights, equal educational and employment opportunities, and optimal economic contributions by all citizens as fundamental anchors of the Task Force vision.

This vision requires long-term commitment, ongoing involvement, and purposeful advocacy by the Task Force's four major sponsors, educational institutions throughout the country involved in health care training for D/HH students, state and federal agencies, health care employers, disability advocacy groups, and professional health care organizations. This vision has the goal of ensuring that the health care career "pipeline" for D/HH individuals facilitates entry to educational and job opportunities. This vision requires a commitment to finding strategies for addressing the financial disincentives faced by educational institutions and health care facilities educating/serving/employing those D/HH individuals who require ongoing reasonable accommodations and/or auxiliary aids and services. It is a vision linked to ever-advancing technology that will enhance communication access for this population. It ensures full opportunity for D/HH individuals to develop the academic skills and experiences they need to gain entry to health care-related training programs. It also encompasses broad-based attitudinal changes toward welcoming D/HH individuals into training programs and employment settings without seeing hearing loss as a significant obstacle to employee productivity.

> We want to direct the focus to "Deaf-gain" as opposed to "hearing loss," a concept that views being deaf not as a lack of hearing but rather a gain in terms of living within a visual-spatial context that contributes to the richness of human diversity (Bauman & Murray, 2010).

In succeeding chapters, the Task Force outlines goals and recommendations designed to make its vision a reality.

Maximizing Access through Technology

A professor of Audiology at the University of Arkansas at Little Rock, Sam Atcherson, 36, teaches, sees patients, publishes widely, and lectures across the country.

The work is varied and rewarding, but the journey to this career has had its twists and turns because of Atcherson's hearing loss.

"I did not have any deaf role models before or during my health care education," he says.

Atcherson began losing his hearing around age 2 or 3 and had a severe-to-profound loss by the time he began his undergraduate studies. His loss was profound when he enrolled in the University of Georgia's graduate program in Audiology.

"I had extensive speech therapy in grade school and middle school. I had itinerant teachers of the deaf in middle school and high school," he recalls. "However, the amount and type of resources varied considerably, because my father was in the Air Force and we moved every three to four years."

In college, "I had no resources and no one looking out for me as I had experienced in my primary and secondary education," he says. "As a result, my grades severely declined. I wish that I was more aware of what I needed when I first started college."

Atcherson transferred to the University of Georgia, a state school whose disability services office helped him obtain hearing assistive technology and notetaking services. In graduate school, he also used speech-to-text services and sign language interpreters in some of his courses.

He seemed well on the way to becoming a clinical audiologist.

"Then, near the end of my master's program, I had a significant change in hearing that made it difficult for me to understand people using lipreading and hearing aids. I thought I might not work directly with patients again."

In 2001, Atcherson got a cochlear implant, which helped restore some hearing. But what really helped get his health care career on solid footing was joining the Association of Medical Professionals with Hearing Losses.

"This organization gave me hope," he says. "I ended up on its board and later served as president."

In 2008, Atcherson moved to Arkansas. He continues to be an active national "voice" in the audiology and deaf communities. "I am now able to give back and give hope and be a role model to a new generation of students with hearing loss," he says. "My advice for young deaf people is to think about what they can offer the world, and to think as broadly as possible."

Helping and Educating Others

Lauren Searls, 25, of Pittsford, NY, is well on her way to becoming a family nurse practitioner, a career she knows she will enjoy for its potential to help and educate others.

She received her bachelor's degree in Biochemistry from Simmons College in Boston, her RN degree from Johns Hopkins University School of Nursing, and has applied for the master of science in Nursing program at Johns Hopkins.

"As a nurse, you get to know your patients, advocate for them, and provide education about health-related issues in a way that meets their lifestyle," she says. "It is a tangible way of working with people and the intrinsic benefits are instantaneous."

"When I looked more seriously into nursing, I felt strongly that to best care for a patient, an understanding of how the structural, social, and cultural contexts that influence one's health is necessary and that being a nurse practitioner is the best place to integrate all of these facets of care. I have meaningful interactions daily and it keeps my own life in perspective. I am constantly humbled by what my patients are going through."

She has relied on interpreters in the classroom and while visiting patients.

"Surprisingly, I have had more barriers in the classroom than in the clinical setting," she says. "These include not having captioned videos and podcasts. Transcripts can sometimes be made, but they are often dense and require a lot of time to go through."

She has found her patients, faculty, and nurses extremely receptive to working with her and an interpreter when she has been in a clinical setting. "I go into the patients' rooms with confidence, introduce myself and tell the patients that I am deaf and will rely on interpreters as needed," she says. "I have been able to make it work effectively. Although I do well in one-on-one situations and small-group settings, I am not hearing. Only 30 percent of the English language is lip readable and there is no guarantee that everyone speaks clearly or is easy to understand. Working with an interpreter is the only way I will be able to ensure I have access to what is going on around me."

She is not sure her successes thus far will continue when it comes time for her to enter the workforce.

"I am not sure what my job opportunities will be once I am finished with school," she says, "because of the costs of interpreters. But right now, I have them and I am going to maximize every learning opportunity."

Chapter 2:
Ensuring High Quality and Innovative Access Services for D/HH Students and Professionals in Health Care Fields

Background and Context

Much progress has been made since the passage of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (ADA), as amended by the Americans with Disabilities Amendments Act of 2008, in providing communication access for D/HH individuals, particularly in education and employment. In general, the ADA requires full and equal access for D/HH individuals in all facets of society. The ADA prohibits discrimination in employment (Title I), public services (Title II), and public accommodations (Title III). Title IV requires the provision of telecommunication relay services. For deaf people, the ADA defines discrimination to include the lack of auxiliary aids and services that are necessary for effective communication. Auxiliary aids and services include (but are not limited to) qualified interpreters and captioning.[2]

The Law

Titles I – III of the ADA and the implementing regulations prohibit discrimination in employment, public services, and public accommodations. Title I requires employers to provide reasonable accommodations for employees with disabilities, which can include interpreting services (42 U.S.C. § 12111-12117). This falls under the jurisdiction of the U.S. Equal Employment Opportunity Commission (EEOC). In general, Titles II (42 U.S.C. § 12131-12165) and III (42 U.S.C. § 12181-12189), both of which are enforced in large part by the U.S. Department of Justice (DOJ), require public entities and public accommodations to pay for necessary auxiliary aids and services to ensure that effective communication occurs, unless "undue burden" or "fundamental alteration" would result (42 U.S.C. § 12131 et seq.). Finally, Title IV (47 U.S.C. § 225), which is enforced by the U.S. Federal Communications Commission (FCC), requires that telecommunications carriers provide functionally equivalent telephone services for D/HH and speech-impaired individuals communicating

[2] For a complete list, see 28 C.F.R. §36.303(b)(1)

with hearing people. Telecommunication Relay Services (TRS), which includes Video Relay Services (VRS), are covered by Title IV.

While hearing people generally rely on both visual and auditory modalities, many D/HH individuals depend primarily on visual modalities that encompass signed languages, speechreading, text, and other visual cues for communication, sometimes with the aid of auditory support depending on individual need. Accordingly, a Title III regulation defines aids and services to include the following:

> Qualified interpreters onsite or through video remote interpreting (VRI) services; notetakers; real-time computer-aided transcription services; written materials; exchange of written notes; telephone handset amplifiers; assistive listening devices; assistive listening systems; telephones compatible with hearing aids; closed caption decoders; open and closed captioning, including real-time captioning; voice, text, and video-based telecommunications products and systems, including text telephones (TTYs), videophones, and captioned telephones, or equally effective telecommunications devices; videotext displays; accessible electronic and information technology; or other effective methods of making aurally delivered information available to individuals who are deaf or hard-of-hearing.

As this regulation recognizes, D/HH have varying communication abilities and preferences. The ADA does not mandate any particular accommodation for D/HH individuals; rather, the inquiry is to be conducted on a case-by-case basis to determine what auxiliary aids and services will ensure effective communication with a particular D/HH individual in a specific setting.

With Titles I – IV of the ADA established, do D/HH individuals now have full access to educational, employment, and career advancement opportunities?

Public data indicate that the percentage of D/HH individuals pursuing higher education and entering the workforce continues to rise (see Table 6, p. 80). But even with all the legal rights put into place through Titles I-IV of the ADA, the Task Force is aware of widespread noncompliance with the ADA, including examples within the health care industry in which access services have been denied because of misunderstandings regarding Health Insurance Portability and Accountability Act (HIPAA) policies, especially confidentiality concerns related to communication access through TRS, VRS, or other electronic means; stereotypical concerns about patient safety; and uninformed decisions regarding educational integrity and the costs associated with access services in education and employment. (See Appendix IV, p. 103 for details.)

Additionally, employment promotions often are impeded due to lack of networking and social opportunities at work and/or conference events. Informal networking in most occupations is critical in terms of knowing how to respond to on-the-job challenges and situations. At a 2002 National Institute on Deafness and Other Communication Disorders (NIDCD) meeting on biomedical and behavioral research career opportunities for deaf individuals (Brookhouser & Padden, 2002), panel members described the importance of informal educational settings and emphasized how graduate, postgraduate, and early career levels increase

the need for such access. Task Force Focus Group interviews held with D/HH students, educators, and practitioners in 2010-11 reiterated this concern. The Brookhouser and Padden (2002) report stated, "The nuances of conducting research, writing research grant applications, and understanding the special requirements of scientific publications are abilities that are essential for a productive career in science, but are not taught in standard courses. Much of that knowledge is shared during informal research settings, where D/HH individuals are often disadvantaged" (p.3).

…we must vigorously pursue emerging technologies such as improved voice recognition systems, enhanced networking media, and remote interpreting, together with onsite interpreting using designated interpreters.

To ensure that D/HH individuals have full access in educational and employment environments as well as in informal networking situations, we must vigorously pursue emerging technologies such as improved voice recognition systems, enhanced networking media, and remote interpreting, together with onsite interpreting using designated interpreters. All of these must be provided by covered entities unless it would result in undue financial burden.

Funding

Funding for access services poses a significant barrier to many D/HH health care students and professionals. Stein and Teplin (2011) argue that compliance with the law requires "a broader and preemptive redistribution of the cost of communication access" (p. 1099). They note that compliance rates are far higher with respect to Title IV of the ADA (which governs relay services) than for the other titles of the ADA. They state that in implementing Title IV, the FCC required all common carriers to pay into a fund, which then paid for TRS and VRS. Since this system requires common carriers to pay into a fund *prior* to deciding whether to provide relay services, common carriers no longer have a financial disincentive that discourages them from providing services. Instead, the system establishes financial incentives for compliance by reimbursing common carriers that do provide relay services. As a result, provision of relay services has become a competitive, revenue-generating business in the last several years. This compulsory shared responsibility for compliance is an important component of the success of Title IV.

In contrast, entities covered by Titles I, II, and III of the ADA (employers, public entities, and public accommodations) generally pay for access only when faced with a request for auxiliary aids and services. For this reason, these titles often have been referred to as "unfunded mandates," since many entities must pay out of pocket to fulfill their legal obligations for access under this provision (Stein & Teplin, 2011). As Stein and Teplin indicate, while small businesses are eligible for tax credits for making expenditures to comply with the ADA, these credits are limited and businesses are liable for the majority of expenses. Tax credits are not available to larger businesses (which may still be able to deduct access costs as business expenses) or government agencies. Institutions/employers who seek to "open their doors" to

I interviewed for an externship opportunity at a hearing college counseling center and was told flat out I would not be considered for the placement because of the interpreter in the room. I have also faced the more subtle, 'She's too expensive' rejection because my accommodations (the ASL interpreters) are viewed as cost-prohibitive.

Maybe they just don't know. Maybe their previous experience wasn't positive. Ideally, access wouldn't be limited by costs. (Caroline Kobek Pezzarossi, Assistant Professor of Psychology, Gallaudet University, 2012)

deaf students/employees are expected to bear a significant portion of the costs of providing specific types of communication access, establishing a fundamental disincentive for training and/or employing deaf persons, especially sizable numbers of deaf persons. Stein and Teplin explain that such financial disincentives often result in lower compliance rates, as covered entities seek ways to avoid providing auxiliary aids and services that will cost money.

As a case in point, health care research funded by the federal government that focuses on deaf population topics (a potentially significant source of training and employment for deaf persons) must expend substantial portions of their budgets on communication access costs, thus limiting the amount of actual research that can be conducted on a deaf population topic compared with an equal-sized budget geared toward a non-deaf-population topic. NCDHR Director Dr. Thomas Pearson captured the quandary facing health care educational institutions in this way:

> The paradox that must be confronted is, on the one hand, the need for Centers of Excellence with critical resources of Deaf professional or research trainees and aggregated resources and technologies to train them well. On the other hand, the development of such a Center would attract disproportionate numbers of Deaf students requiring interpreter services, which, by law, should be provided. The business model fails quickly with institutions without a specific mandate and financial support to train Deaf students forced to choose to support the training of one Deaf student versus two or more other students from underrepresented groups. *(Video of Pearson addressing the Task Force, September 2011)*

The removal or diminishment of such fiscal barriers would in turn remove a great disincentive presently limiting the amount of education and science focused on deaf health care topics (Barnett, McKee, Smith, & Pearson, 2011). Further, it is clear that it will be more challenging for D/HH individuals to aspire to career opportunities in the health care industry without additional attention paid to the issue of financial disincentives. Stein and Teplin (2011) suggest applying Title IV's model to the other parts of the ADA. If resources are pooled in advance of requests for auxiliary aids and services, then covered entities no longer will seek to evade their obligations to provide auxiliary aids and services because they already paid in advance for their share of the costs. In the short term, they argue, hospitals and uni-

versities could voluntarily pay into a fund that could be used to pay for interpreter services at any member hospital. Longer term, legislative, and regulatory reform could establish mandatory pooling of funds by private businesses to divorce financial considerations from the determination of whether to provide auxiliary aids and services.

The Task Force proposes various models (see Goal II on p. 35) to address the funding of access services. These recommendations must be aggressively pursued in order to level the playing field for this group of Americans.

The demand for interpreters in health care venues continues to grow. Are there sufficient qualified interpreters available to provide services for D/HH students and professionals in these settings?

Another challenge facing students and professionals in the health care fields, particularly at the post-baccalaureate level and in professional health care educational institutions, is ensuring that the supply of interpreters who specialize in health care interpreting keeps up with demand as more D/HH individuals enter the health care fields as medical doctors, dentists, physician assistants, nurse practitioners, psychologists, and allied professionals, including scientists, academic researchers, laboratory workers, and information technology specialists. Qualified health care interpreters exist, but ensuring the continued high quality is critical because of the very specialized nature of terminology related to each health care discipline and the importance of knowing medical or technical vocabulary that rarely is used outside of the health care, technology, or science settings. Such specialized interpreters, also called designated interpreters, have received training in content and vocabulary, and are attuned to the social role of the professional for whom they are interpreting, as well as their own role in specific settings such as the classroom and meetings between and among medical colleagues (Campbell, Rohan, & Woodcock, 2008).

I think it is very important that I am assigned to an interpreter that knows my background. When it comes to a tough course, it does matter. The interpreter knows how my mind works and could convert words into a way where I can understand it. All interpreters have different styles of signing. Technology, including C-Print™ classroom captioning and my hearing aids, have helped me greatly to do well in school. (Abbey Moreland, Biology Student, Rochester Institute of Technology, 2013)

Technological innovations have changed how we all communicate, benefitting hearing and D/HH individuals alike. Have these technologies made it more possible for D/HH individuals to function specifically in health care professions? What more needs to be done in order to make education and employment more accessible to deaf employees?

In addition to support and funding for interpreting services, developing technological solutions for access services may address some of the current barriers D/HH individuals face in the health care educational settings and workplaces. In the past 10 years, several technological breakthroughs have altered the access landscape. With the proliferation of smartphones and the popularity of texting, D/HH individuals have been able to communicate in ways unimaginable in the past. Email and social networking media also have enabled many D/HH people to participate in social and professional activities without the obstacle of communication access.

Within the health care industry, technological developments have made it possible for previously inaccessible functions based on auditory input to be visually accessible. A see-through surgical mask enables some (not all) D/HH individuals to speechread even in surgical settings; a multi-purpose vibrating pager alerting system allows D/HH health providers to be informed about their sound environment; visual display software that connects a stethoscope with an output jack to a PDA (Personal Digital Assistant) to provide a visual reading of auditory-based data, and amplified stethoscopes are several of many examples of technology at work. Enhanced communication access also has been achieved through voice carryover phones, CapTel, videophones, video relay services, real-time captioning systems (including FaceTime, Skype, etc.), secure web health portals permitting providers and patients to communicate via texts and emails, and telemedicine through Web-based cameras and videophones. The rapid development of "apps" for smart phones and iPads also has had a tremendous positive influence on access for D/HH individuals. A stethoscope app (e.g. iStethPro) can be used with an iPhone or iPod to evaluate heart sounds reasonably well.

> The Task Force considers the development of innovative technological solutions in support of access services for D/HH health care providers and D/HH students in health care settings to be an area of increasing need and potential.

What we are witnessing in this technological whirlwind is a crossover effect. Products being developed for the general population also serve an important function for D/HH individuals (such as smartphones and texting) and technologies that primarily assist D/HH users now are seen as beneficial to the entire population (such as closed captioning)[3]. Yet, even with all the technological innovations that have improved the lives of many D/HH health care pro-

[3] It is useful to distinguish between *assistive technologies* and *access technologies*. *Assistive technologies* enable individuals to perform tasks that they formerly were not able to do or had great difficulty doing. *Assistive technologies* incorporate enhancements to or change the methods of interacting with the technology needed to do a certain task. Two examples are text telephones and hearing aids. *Access technologies* typically require human interaction to be successful, generally are used to facilitate communication, and typically require a specialist (in varying degrees). Two examples are captioning and interpreting (W. Clymer, personal

communication, October 7, 2011).

fessionals and D/HH students in health care settings, improvements still need to be made. Some specific examples follow:

- There are several limitations in visual access for D/HH health care workers. "Cloud technologies" [4] and enhanced voice recognition systems offer some promise, but still need more development to meet the visual access needs of D/HH health care students and professionals.

- Using amplified, electronic stethoscopes to listen to heart, bowel, and respiratory sounds can be a tool of significant benefit over conventional acoustic stethoscopes to D/HH health care workers. These electronic stethoscopes often can be connected to many hearing aids and cochlear implants or used with headphones. However, there is a known limitation in hearing aids and cochlear implants that make it difficult to hear some of the lowest pitch body sounds (< 100 to 200 Hz). This difficulty is due, in part, to the limited low frequency cutoff in hearing aids and cochlear implants intended to maximize speech frequencies, and is also due to rather ineffective amplification relative to hearing acuity in the low frequency range.

- There is no data-supported evidence that see-through surgical masks really aid in speechreading. Additionally, an ongoing hypothesis suggests that an existing design distorts sound waves. Another see-through mask still under development may prove to be a better option, but has yet to be evaluated.

- The use of telemedicine is still inhibited by reimbursement and coverage limitations. Further research is needed to document its feasibility and cost effectiveness. The use of remote stethoscopes and electronic health records can permit care even for marginalized individuals.

- Online Webinars or distance learning, particularly for continuing health care-related education and other health care-related training, often are not accessible for D/HH health care personnel.

The Task Force considers the development of innovative technological solutions in support of access services for D/HH health care providers and D/HH students in health care settings to be an area of increasing need and potential.[5] It is critical to be at the forefront of product development in order to have a major impact on improving accessibility for D/HH health care workers and students in health care settings as well as the general health care workforce. In addition, research and development of such health tools and technologies could be led by D/HH inventors and investigators.

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[4] "Cloud technologies" refers to a Web-based infrastructure that allows organizations and users to access applications and computer services on demand from anywhere in the world. A cloud application is made available for use via the Internet, rather than requiring software applications be installed and run on individual computers. Applications and data are stored on Web-based servers, reducing the need for software and related data on local user computers.

[5] These solutions could come from using a *technology transfer* concept, which is a process of "conceiving and implementing a new application for an existing tecnology"; *supply push technology*, which would seek out new products or technologies developed by inventors or researchers (i.e., new universal design equipment for all health care workers to use) and *demand pull technol- ogy*, which identifies "a functional limitation in an existing product" and comes up with a technological solution that must be validated and accepted by the general market (i.e., the see-through mask or visually displayed stethoscope) (http://t2rerc.buffalo.edu/pubs/training/index.htm).

Goal I: Access and Technology Services

By 2022, a nationally recognized resource providing consultation and supporting technol- ogy advancement regarding access services will be established. This resource will support the continuing growth of innovative access services and assistive technologies tailored specifically to D/HH students and professionals in health care fields that comply with universal design principles and will represent collaboration among postsecondary institutions (including research and technology development expertise), private health care employers, professional associations, federal agencies, and private manufacturers of auditory, visual, and tactile instrumentation.

Such a resource would:

1. *Provide guidance and consultation about interpreting services for D/HH students, employees, and employers in medical, health, and bioscience fields;*
2. *Provide consultation and information regarding currently available access services and assistive technologies in light of individual needs;*
3. *Provide guidance for D/HH students and professionals and the organizations that support them in crafting solutions for providing required access services and assistive technologies;*
4. *Sponsor partnerships among postsecondary institutions, private industry, and the federal government in the development, testing, and commercialization of emergent access services and assistive technologies;*
5. *Provide guidance and consultation for universal design compliance and principles for existing medical and health technologies that apply to D/HH individuals;*
6. *Generate certification standards and procedures, in collaboration with appropriate professional associations, regarding the provision of access. This resource also would generate certification standards and procedures regarding the provision of access services by interpreters and real-time, computer-aided transcribers in educational and professional health care settings, as well as technical standards regarding the capabilities of assistive technologies.*

Implementation Recommendation 1

The founding institutions have agreed to set up a health care access and communication consultation service to function as an information dissemination service, a technology lab for assessing assistive devices, and an equipment loan program for D/HH individuals who can test the suitability of specific equipment for educational or employment needs. This service should be formalized as a national consultation/technology development resource called **The National Center on Access Services Innovation and Consultation for Deaf and Hard-of- Hearing Health Care Students and Professionals (NCAS).** Its functions would be:

1. To provide proactive information such as a position paper about HIPAA policy and clarification of HIPAA requirements regarding the use of certain communication technologies in addition to sign language interpreters. Examples could include the use of text pagers or videophones to securely convey private patient information between D/HH and hearing health care providers. It also would provide information and resources about legal rights and how to obtain legal guidance. (See, for example, http://nad.org/issues/ health-care.)

2. To work with relevant federal agencies (e.g., the Department of Education) to develop requirements that all educational films produced through federal sponsorship, including online continuing education offerings for medical personnel, be captioned. An expanded educational campaign directed at Congressional representatives, members of the White House Office of Public Engagement and other groups would be appropriate.

3. To provide information about current technological solutions for access services, including, for example, an equipment testing/loan program, universal design applications, and assistive technology services. It also would offer specialized interpreting consultation for medical and scientific fields. Together with the Joint Commission (formerly the Joint Commission on Accreditation of Health Care Organizations), NCAS can develop best practices, policies, and guidelines for accessible communication procedures and ways to utilize existing technologies.[6]

4. To provide direct consultation services for technology assistance. This could include providing information or instruction to audiologists about relevant auditory- and visual-based technologies used in medical fields, developing a Web-based auditory and visual resource listing of various bodily organ sounds, and providing hands-on opportunities for D/HH students to practice listening to or visualizing these organ sounds. On a related note, there may be a need for an onsite or referral audiology consultation service on how to couple and maximize hearing aid fittings and cochlear implant mapping strategies for use with specialized stethoscopes.

[6] The Joint Commission (2011) is a non-profit organization that accredits more than 19,000 health care organizations and programs in the United States (http://www.jointcommission.org/).

5. Sponsoring partnerships among postsecondary institutions, innovative technology companies, organizations such as the Association of Medical Professionals with Hearing Losses, state and federal agencies, and hospitals/health care centers/private health care employers in the development, testing, and commercialization of emergent access services and assistive technologies. Engineering programs throughout the country could participate by training future engineers (both hearing and D/HH) to work on such technological solutions. NCAS could work with manufacturers of acoustic, visual, and tactile instrumentation and advise on issues of universal design for prototypes, conduct research on needed technological solutions in health care, and develop/test/manufacture and market such solutions. Some examples might include:

    - Developing vital signs "apps" plus related hardware improvements specific to a variety of health care situations/professions;
    - Working with voice recognition apps tailored for specific fields that can be used, such as a digital or technology interpreter for D/HH individuals who can communicate using spoken English;
    - Investigating the usefulness of "Cloud technologies" for access needs pertaining to health care careers;
    - Piloting test telemedicine models and using D/HH students/professionals in the operation of telemedicine technology;
    - Collaborating with technology company innovators to address access solutions;
    - Pursuing innovative research projects such as "A Signing Avatar" that would translate spoken language into sign language using avatar animation technology;
    - Enhancing accessible sign language interpreting through the development of novel technologies (e.g., use of iPhones, tablets, and medical smart computers);
    - Developing the use of novel technologies that incorporate the use of tactile or sensory modes (e.g., tactile technologies that allow people with enhanced sensory abilities to utilize these mechanisms for diagnostic purposes).

6. Facilitating the training of qualified medical interpreters by having NCAS work with the Registry of Interpreters for the Deaf (RID) to develop national certification standards for health care interpreters. It would also develop curriculum and training opportunities for medical interpreters who are trained in health care interpreting and designated interpreters whose job is to work with D/HH health care professionals as well as consult with employers on the provision of these specialized services.

Goal II: Funding for Access and Technology Services

By 2022, the four founding institutions will have investigated and demonstrated successful strategies for expanding resources used to fund required access services and assistive technologies so as to minimize institutional disincentives for educating and hiring D/HH individuals. These strategies will be shared nationally with other programs working with D/HH students and professionals in health care areas.

Implementation Recommendation 2

We recommend that the following funding strategies (and other possible strategies) be investigated and implemented by the founding institutions, with the assistance and counsel of the National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals (described in Goal IV, p. 59). These strategies also can be shared nationally with other institutions struggling with access cost issues.

1. Establishing a "collective compliance" model similar to the Minneapolis/St. Paul Twin Cities Hospital Interpreter Consortium, which developed a funding pool to divide communication access costs among stakeholders. Each hospital pays a monthly fee to ensure that a qualified medical interpreter is on call for Emergency Room services. This fund came about partly as a result of litigation against Emergency Room medical service providers who failed to provide effective communication options for D/HH patients. (See Stein & Teplin, 2011 for further information.) This model could be adapted or expanded to include reimbursement for interpreting services for D/HH individuals in health care educational or training programs as well as in health care careers.

2. Partnering with legislators and policymakers to expand tax credits and deductions available for institutions and companies who hire D/HH health care workers. This could include the development of a policy paper reviewing the importance of tax credits and deductions to minimize the disincentive for D/HH friendly employers who are burdened with higher accommodation costs.

3. Pursuing alternative mechanisms for funding Video Remote Interpreting (VRI) services, including securing the enactment of legislation authorizing the FCC to fund VRI as well as VRS and/or separate legislation creating a funding mechanism for VRI services parallel to the funding mechanism used for VRS. (See p. 27 for details.) Current FCC regulations prohibit the use of Telecommunications Relay Service (TRS) funds for communication in the same location. Specifically, the FCC has a reimbursement restriction on relay calls when the deaf and hearing person are in the same room (Rosenblum, 2011; Stein & Teplin, 2011). The Task Force believes that a mechanism for funding mandated communication accessibility under Title I (employment), Title II (public services), and

Title III (public accommodations) for VRI services could be adopted, enabling more compliance by health care providers while facilitating training and employment interactions.[7]

4. Testing of VRI services at health, scientific, and educational centers. With the use of VRI, conversations can be conducted between hearing and D/HH individuals using a remote video sign language interpreter. Costs are based on the amount of time used for these services. Testing the effectiveness of such services could include developing a VRI program (in collaboration with a VRI company) to pilot, test, and develop a medical/scientific-based program (possibly through the use of smartphone technology). To examine cost effectiveness, one could develop a monthly VRI subscription plan (e.g., x number of minutes for y number of dollars) to be tested on a small group of D/HH students and professionals in health care to determine how costs could be managed through individual self-monitoring of VRI services. Another possibility would be for larger institutions to provide VRI in-house through hiring interpreters to be available "on call" on a remote basis. The VRI services provided by URMC's "Strong Connections" program might serve as the prototype for a model program with fiscal support. Whether this results in significant savings could be evaluated.

5. Collaborating with organizations such as the National Association of the Deaf (NAD), Hearing Loss Association of America (HLAA), or other related organizations to set up a funding commission to investigate the feasibility of centralized access funds to help cover costs considered by institutions and employers to be "beyond burdensome." Such a commission might consider partnering with other disability groups needing similar types of accommodations that incur significant costs.

6. Promoting the enactment of a requirement that all federal and state health, science, and engineering-related research and academic grants provide supplemental funds to ensure adequate accommodations for D/HH students, employees, and professionals. This avoids the disincentives for including D/HH people within these grants.

7. Working with the Office of Vocational Rehabilitation to provide access service funding for D/HH individuals enrolled in professional health care education programs.

8. Promoting public and employer awareness by providing information (position papers) about ADA-established responsibilities for providing accommodations and working with disability rights lawyers and other policy experts to identify additional mechanisms to promote and fund access services.

The Task Force strongly believes that these two Goals and associated Implementation Recommendations are critical if we wish to see additional representation of D/HH individuals in health care fields.

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[7] The Federal Relay Service provides an intermediary Telecommunications Relay Service (TRS) for individuals who are deaf, hard-of-hearing, and/or have speech disabilites, including Federal employees, for communications with and within the Federal Government. Federal Government agencies may meet their obligation under Section 504 of the Rehabilitation Act of 1973 with the Federal Relay as an option to provide reasonable accommodations to employees with disabilities in the workplace.

The Value of Support

Dr. Scott Smith, 42, an assistant professor in the Department of Community and Preventive Medicine at the University of Rochester (NY) Medical Center, was born in Winston-Salem, NC, and was identified as profoundly deaf at age 1. He has had support services, including sign language interpreters, all the way from primary school through medical school. He majored in Biochemistry at East Carolina University and received his M.D. from East Carolina's Brody School of Medicine.

"One of the reasons I stayed so long in North Carolina was that I had grown comfortable with their system," Smith says. "They knew who I was and we had identified interpreters who were committed."

After a general pediatric residency at the Children's Hospital at Eastern North Carolina University, he did a fellowship in General Academic Pediatrics at Massachusetts General Hospital for Children. He followed that with a master's degree in Public Health from Harvard University and a second clinical fellowship at the Floating Hospital for Children, part of Tufts Medical Center.

"When I worked as a full-time clinician, I functioned very much like any other doctor in community practice," Smith says. "Ninety-five percent of my patients were hearing. I had interpreters when I needed them."

In 2004, Smith moved to Rochester to work as an attending pediatrician specializing in pediatric behavior at Rochester General Hospital.

Technological advances have helped Smith to do his job. He uses a graphic auscultation system, which produces visual waves to represent heart sounds, to "listen" to his patients' heartbeats and breathing patterns.

Smith says he has never experienced a negative reaction from a patient because he is deaf.

"The key is how I present myself to my patients," he says. "I work very closely with my interpreter to make sure the information I am delivering is clear and confident. And patients are interested in sign language, especially children. They do not see me as disabled."

Smith would like to see more collaboration between colleges and deaf professionals to identify, create, and disseminate affordable technological solutions to fill the gaps deaf professionals face.

"In order to bring more deaf people into the health care system as providers, we need to come up with creative ways to remove the financial constraints that prevent deaf professionals from contemplating working in the health care field. I would love to remove the stress in the relationship between deaf professionals and the people employing them so everyone would become more productive and successful."

Nothing Should Stop You

Abbi Simons, 22, of Crystal Lake, IL, will receive her bachelor's degree in Biomedical Sciences from Rochester Institute of Technology in 2012.

Her prior work experience has found her at the Smithsonian Institution's National Museum of Natural History, in an animal hospital, and at Rochester Animal Control.

She plans to take a year off after graduation before deciding what's next for her.

"I plan on applying to veterinary school or to Ph.D. programs in Epidemiology and Public Health where I would like to focus on infectious diseases," she says. "I always wanted to enter the health field because I felt there weren't enough deaf people in those fields. So I wanted to do something where I could help others and at the same time teach people that deafness is not an obstacle."

Simons was identified as deaf when she was 8 months old and prefers to communicate using American Sign Language and signed English. When considering a career, she initially wanted to become a trauma doctor. But after meeting deaf doctors in the profession, she learned most practice internal medicine or pediatrics because communication is easier in those fields.

"I know that the only medical field I am interested in is emergency trauma," she says. "But I have such love for animals, which is why I'm considering veterinary school. Obviously I don't have a set plan yet, but I know my career will be medical related -- maybe medical care for animals or studying diseases."

Simons went to a preschool for deaf children, then was mainstreamed with interpreters through high school. At RIT, she received interpreting and captioning in her classes. Being in Rochester also gave her exposure to medical professionals who are deaf. "They helped guide my decision."

During her work experience, Simons says she has faced the same barriers other deaf people have faced. She didn't think some people had patience while teaching her to assist with medical procedures, yet others were incredibly helpful.

Her advice for students contemplating a career in health care: Take hard courses and get a variety of experiences. "My jobs/internships have ranged from plant anatomy microscopy to molecular genetics lab work to animal medical care," she says. "Those experiences have been a huge factor in guiding my decision to be where I am today. Don't let anyone or anything stop you from doing what you want. Only you know what will make you happy."

Chapter 3:
Re-Envisioning Educational Experiences and Preparation

Background and Context

During the 1950s and '60s, government policies focused on enabling individuals from low income and disadvantaged families to have access to postsecondary education. In 1973, when Section 504 of the Rehabilitation Act was passed, individuals with disabilities gained similar access. This law applied only to entities receiving federal financial assistance. The provisions of Section 504 were extended by the passage of the Americans with Disabilities Act of 1990 to prohibit discrimination on the basis of disability by all public entities, regardless of whether or not they received federal funding, and public accommodations.

State and federal efforts in support of these acts have taken a variety of forms, including financial support for individuals with disabilities in community colleges and state university systems. One example is that of increased funding from state Vocational Rehabilitation agencies as well as additional funding from states for their public colleges to provide support for these individuals. Increased financial aid to students who are D/HH has not only improved access to higher education, it also has improved their opportunities to pick the school of their choice. As a result, we have seen significant educational gains within the D/HH population as evidenced by their educational attainments. Table 6 (see next page) compares terminal educational attainments reported by Schein and Delk (1974) from the 1972 census of the deaf population of the United States with results calculated using the 2010 American Community Survey (ACS) (U. S. Census Bureau, 2010b). The percentage of D/HH individuals attending or graduating from college has increased dramatically by approximately 400% over the 38 years between 1972 and 2010.

Table 6 Comparison of Highest Level of School Attainment of D/HH Individuals in 1972 and 2010

Education Level	1972[8]	2010[9]
No High School Diploma	53.3%	20.1%
High School Diploma	34.7%	33.1%
Some College	5.6%	23.5%
College Graduate	6.4%	23.3%

**From Schein and Delk (1974)*
***Calculated from U.S. Census Bureau (2010b)*

While these improvements are grounds for celebration, the numbers of D/HH students pursuing bachelor's degrees continue to show disparities compared to the general population. Specifically, in 2009, approximately 60% of D/HH high school graduates attended some form of postsecondary education (Walter, 2010). Of these students, 57% attended two-year or less than two-year schools. This compares to 48% for hearing students. Only approximately 33% of D/HH students were pursuing bachelor's degrees compared to 47% of hearing students.[10] Comparable numbers of D/HH and hearing college majors were registered for health care career majors (see Figure 2 on the next page), but there is a striking disparity in the attainment of terminal degrees. Moreover, as noted in Figure 3 on the following page, 63% of D/HH students majoring in health care fields are pursuing degrees or certificates requiring two years or less of preparation. In comparison, only 39% of hearing students in health care fields are pursuing such degrees. Clearly, these data demonstrate that D/HH individuals need increased awareness of and better preparation for education and training opportunities that will enable them to pursue a wider spectrum of job opportunities in the health care and biomedical workforces.[11]

D/HH individuals need increased awareness of and better preparation for education and training opportunities that will enable them to pursue a wider spectrum of job opportunities in the health care and biomedical workforces.

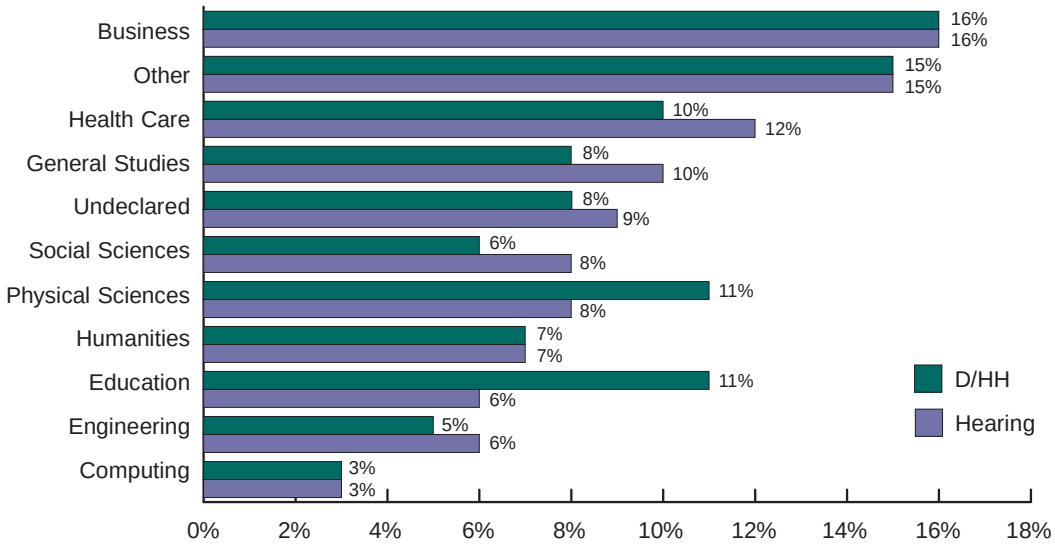
[8] Terminal educational attainments reported by Schein and Delk (1974) from the 1972 census of the deaf population of the United States.

[9] Calcuations from American Community Survey (2010b)

[10] Among the many factors that determine choice of college and level of education are preparation for college, parent socioeconomic status, motivation, etc.

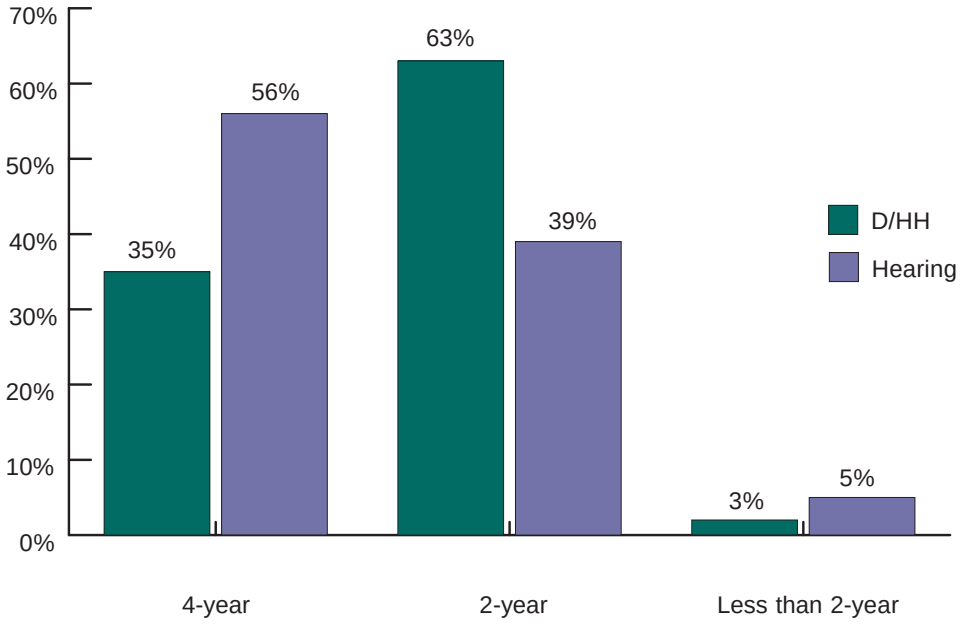
[11] Center for Health Workforce Studies (2010)

Figure 2 College Majors for Undergraduates Ages 18-25 by Hearing Level



Source: U.S. Department of Education, National Center for Education Statistics (2008)

Figure 3 Institution Level of Undergraduate Students in Health Care Majors by Hearing Level



Source: U.S. Department of Education, National Center for Education Statistics (2008)

The 2008 National Postsecondary Student Aid Study (U.S. Department of Education, National Center for Education Statistics, 2008) reports that approximately 136,000 postsecondary students indicated they were D/HH. Individuals with a hearing loss who do not perceive themselves as D/HH probably are not included. The ACS (U.S. Census Bureau, 2010a) estimated that, in 2008, there were 167,000 D/HH college enrollees. It is reasonable, then, to expect that between 136,000 and 160,000 students who are D/HH were enrolled in postsecondary schools in the United States. This number demonstrates that there are significant numbers of D/HH students in postsecondary programs who can be trained to fill the wide variety of jobs within the growing health care fields (see Table 3, p. 74).

In *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report* (Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, 2011), the Task Force recommended a number of "action steps" targeted at pre-college students, students in the college pipeline, and post-college students that could be implemented soon to increase the number of D/HH students entering health care fields. Such efforts should be expanded and enhanced. Health careers awareness, pre-college programming, comprehensive one-stop information sources, workplace exposure through mentoring and internship opportunities, and several academic initiatives all support the goal of creating and expanding opportunities for D/HH individuals to pursue health-related and biomedical science fields, as well as related academic careers that involve research. We must, however, move beyond these starting points in order to truly expand access.

In investigating the educational experiences and preparation needed by D/HH persons to enter and succeed in health care careers, the Task Force was guided by several basic questions.

Do D/HH students have sufficient opportunities to develop the requisite skills, especially in the STEM areas, that lead to careers in health care? Are there comparable career edu- cation or career "pipeline" efforts for D/HH individuals as for other underrepresented minorities that inform, inspire, and lead to increased numbers entering the health profes- sions fields?

As indicated in Chapter 1, only 5.8% of D/HH persons who are in the labor force have jobs in the health care industry, as compared to 9.7% of hearing people. D/HH individuals are underrepresented in the health care industry and lag as well in the areas of higher skilled health care professions (see Table 1, p. 68). As with occupations in general, persons who are D/HH tend to be employed at higher rates in occupations that are considered blue collar, while higher percentages of persons who are hearing are employed in emerging technical fields related to information technology and health care (Walter, 2010). These same fields also require higher levels of education for entry. The significantly improved percentages of D/HH individuals obtaining college-level training (see Table 6, p. 80) demonstrate the potential for this group to fill anticipated vacancies in a variety of health care jobs. It also shows the potential for increased participation in graduate and professional educational degree programs in health-related fields through paving the way for training D/HH scientists and health care professionals for postdoctoral research fellowships, academic careers, and other possibilities.

While there is considerable literature available describing and evaluating "pipeline" programs to encourage minority and disadvantaged youth to enter the health care professions (U.S. Department of Health and Human Services, 2006; Smith, Nsiah-Kumi, Jones, & Pamies, 2009; U.S. Department of Health and Human Services, 2009), virtually no literature exists on such programs for individuals who are D/HH. The few training programs designed specifically for D/HH individuals reside in just three institutions — Gallaudet, RIT/NTID, and the Southwest Collegiate Institute for the Deaf at Howard College. Yet none of these can be considered health care training "pipeline" programs because they do not provide continuous educational opportunities that start as early as middle/high school and prepare students for success at the next level of health care education, right up to and including graduate and professional education.

"Pipeline" programs refer to career-related strategies that aim to increase the numbers of well-prepared underrepresented minority (URM) students entering the health care professions or other fields of great national significance. The "pipeline" metaphor implies the need to manage input, leakage, and output simultaneously to maximize flow and output to the workforce. An example of one of these "pipeline" educational efforts that focuses on input covers after school and summer activities to motivate, prepare, and inform students about career opportunities. "Pipeline" programs also include career development with an emphasis on mathematics and science instruction at the high school level, mentoring and internship programs at the postsecondary level, and special consideration for admission and support at the postgraduate level.

In order to increase the numbers of D/HH students entering and succeeding in health care majors, comparable collaborative pre-college and college "pipeline" programs geared toward STEM and related health care disciplines targeted specifically for D/HH students must be established.

Some isolated pre-college programs targeted for D/HH high school students in STEM fields exist. Gallaudet has had several three-year grants, starting in 1985, from the National Science Foundation (NSF) for its summer Young Scholars Program (later changed to the Summer Science Program) for D/HH students. The University of Rochester has several programs for underrepresented minorities, including the Summer Research Fellowship Program (SURF) and the Science and Technology Entry Program (STEP), into which deaf students have been enrolled. RIT/NTID recently obtained an NSF National Center of Excellence grant to establish *DeafTEC: Technological Education Center for Deaf and Hard-of-Hearing Students* as one of approximately 40 Advanced Technological Education (ATE) National Centers of Excellence around the United States. The mission of *DeafTEC* is to become a resource for high schools and community colleges across the country that educate D/HH students in STEM-related programs and for employers hiring D/HH individuals. While these attempts at reversing the low numbers of D/HH individuals entering STEM fields is encouraging, longer-term commitments are needed for this group of underrepresented students. Smith et al. (2009) stress the need for a collaborative effort to make "pipeline" programs successful:

> Pipeline programs are an important strategy for addressing the shortage of

URMs (underrepresented minorities) in the health professions. Anti-affirmative

> action initiatives threaten the existence of these student preparation programs and the ability of our nation to produce physicians of color and other health care providers who are more likely to serve in underrepresented communities and work to reduce related health disparities. Programs at universities and academic medical centers must develop innovative partnerships with underserved communities, adopt strategies that demonstrate a strong commitment to increasing racial and ethnic minorities in the health professions, and develop viable funding mechanisms to support diversity enrichment programs (p. 836).

In order to increase the numbers of D/HH students entering and succeeding in health care majors, comparable collaborative pre-college and college "pipeline" programs geared toward STEM and related health care disciplines targeted specifically for D/HH students must be established. These programs must include adequate subsidies for access services. These services would make programs comparable to those established for other underrepresented groups. A description of some existing "pipeline" programs is provided in Appendix III (p. 98).

What complementary institutional and policy-level strategies might be used to increase the number of D/HH individuals in health professions?

Complicating the educational landscape for D/HH individuals are policies and practices related to admissions. Admission to health care training institutions is generally quite competitive and relies on a combination of quantitative information (i.e. grade point average, especially in science courses, and standardized admissions test scores) as well as qualitative information (i.e. extra-curricular activities, work experience, personal statements, etc.). Of particular concern for D/HH students, as for other underrepresented groups, are the challenges posed by high-stakes, standardized, norm-referenced tests such as the Scholastic Aptitude Test, Graduate Record Examination, Medical College Admission Test, Optometry Admission Test, Dental Admission Test, Pharmacy College Admission Test, and the Veterinary College Admissions Test.

As with other underrepresented minority applicants, D/HH individuals generally tend to score lower on these standardized tests compared to their hearing peers, though there are exceptions (Mounty & Martin, 2005). This disparity occurs for a variety of reasons, but often it is because standard written English does not consistently represent this population's primary language (Mounty & Martin, 2005; PEPNet, 2010) and standard written English is the medium for standardized tests.

The results from the Woodcock-Johnson III tests (see Table 7 on the following page), which were administered as part of the National Longitudinal Transition Study 2 (Wagner, Newman, Cameto, & Levine, 2006), show that in the areas of Comprehension, Science, and Social Studies, about 70% of students who are D/HH scored in the lower quartile (below the 25th percentile) compared to the norm group that does not include D/HH students. On average, students who are D/HH did not score above the 50th percentile in any of the subtests. They scored best on the Calculation subtest where, on average, they scored in the second quartile at the 38th percentile. On all other subtests, they scored at or below the 25th percentile. On the Applied Problems subtest (involving reading and mathematics skills), only 1% scored above the 75th percentile.

Table 7 Percent of Students Who Are D/HH Scoring in Each Quartile on the Wood- cock-Johnson III Tests

Percentile	Applied Problems	Calculation	Comprehension	Social Studies	Synonym-Antonym
0-25	54%	40%	76%	69%	57%
26-50	33%	18%	12%	17%	24%
51-75	13%	29%	5%	7%	12%
>75	1%	13%	7%	7%	7%
Mean	25%ile	38%ile	18%ile	22%ile	26%ile

Source: *NLTS2 Direct Assessment Academic Knowledge Tables (Wagner, Newman, Cameto, & Levine, 2006).*
Applied Problems Table 4 (http://www.nlts2.org/data_tables/tables/5/ndaAP_PRfrm.html)
Calculation Table 3 (http://www.nlts2.org/data_tables/tables/5/ndacalc_prfrm.html)
Comprehension Table 2 (http://www.nlts2.org/data_tables/tables/5/ndaPC_PRfrm.html)
Science Table 6 (http://www.nlts2.org/data_tables/tables/5/ndaSci_prfrm.html)
Social Studies Table 5 (http://www.nlts2.org/data_tables/tables/5/ndaSS_prfrm.html)
Synonym-Antonym Table 1 (http://www.nlts2.org/data_tables/tables/5/ndaSyn_prfrm.html

These data speak to the urgent need to address the educational deficiencies noted, especially in terms of middle school/high school academic readiness, outreach, and college-based and post-graduate based academic support initiatives. Moreover, those D/HH individuals who are able to achieve academic achievement levels that permit entry into higher education (keeping in mind that these data reflect group results) often face limitations in their ability to score "required levels" on standardized tests and may be denied access to health care careers because of the focus on quantitative admissions measures. We see parallels in terms of issues with standardized testing for underrepresented minority students, as described in a 2004 report covering diversity in health care fields that was developed by a working group co-sponsored by the National Academy of Sciences and the W.K Kellogg Foundation. This document: *In the Nation's Compelling Interest: Ensuring Diversity in the Health Care Workforce (*Smedley et al., 2004) is quite revealing in terms of describing barriers for underrepresented minority students and standardized testing. For example, it is noted that while standardized test scores could be used as predictors of subsequent academic performance, they "have been used in some cases inappropriately as a barometer of applicants' academic 'merit,' often to the detriment of URM" (Smedley et al., 2004, p. 6). In fact, the publication cites studies indicating, "Standardized admissions tests do not show the full range of abilities that are needed to succeed in higher education (Sternberg & Williams, 1997), nor were they designed to" (p. 6). And they found that when quantitative standardized tests are weighted heavily in the admissions process, underrepresented groups (and we include D/HH here as part of such groups) are less successful in gaining admission than applicants from non-underrepresented backgrounds.

When educational institutions, particularly those offering professional training, rely on quantitative measures as an important screening mechanism, this results in fewer and fewer D/HH individuals in those professional roles. Alternative admissions models that balance ap-

plicants' qualitative attributes (especially attributes recognized as critical to successful health care providers, such as commitment to service, community orientation, experience with diverse groups, and other factors), along with quantitative criteria, achieve the goal of recruiting a more diverse applicant pool while also maintaining program quality. In other words, it is possible for diversity and quality goals to coexist in admissions practices.

The barriers and obstacles faced by underrepresented groups in gaining access to professional training have led several health professional educational institutions to revise current practices. Smedley et al. (2004) describe how some institutions have established percent solutions (where a top percent of graduates are guaranteed admissions) or early matriculation programs (involving summer curricula that provide introduction to professional training). Others have modified admissions processes by assuring diversity on admissions committees, training admissions committee members, partnering with undergraduate colleges to support the admissions process into professional programs, and placing more weight on applicants' qualitative attributes. These actions have guaranteed a more diverse entering class for these institutions without diluting quality.

At the output end of the educational "pipeline," particularly in health care fields, is the expectation of successful completion of licensing and credentialing exams. Often, these exams serve as gatekeepers for otherwise qualified and successful health care trainees because of possible bias in the measurement instruments (Rosenfeld, Keiser, & Goldsmith, 2002). These biases could be related to the language construction of the questions or phrases that can be confusing for test-takers whose native language is not English (Childs, 1990; Hernandez, 1994; Mounty & Martin, 2005). They also could be related to the way in which exit competencies are framed, often focusing on the physical requirements, which can preclude a D/HH individual from being able to demonstrate competency.

Under the ADA, certification tests should be selected and administered so as to best ensure that, when the examination is administered to an individual with a disability that impairs sensory, manual, or speaking skills, the examination results accurately reflect the individual's aptitude or achievement level. It should not reflect the individual's impaired sensory, manual, or speaking skills (except where those skills are the key factors that the examination purports to measure) (28 C.F.R. § 36.309). Furthermore, Title II of the ADA bans discrimination by state governments. It states that: "... no qualified individual with a disability shall, by reason of such disability, be excluded from participating in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by such entity" (42 U.S.C. § 12132). In interpreting this language, the Department of Justice has issued a regulation to the effect that Title II is applicable to licensing and certification programs (28 C.F.R. § 35.130(b)(6)). This regulation prohibits state agencies from administering a licensing or certification program "in a manner that subjects qualified individuals with disabilities to discrimination on the basis of a disability nor may a public entity establish requirements for the programs or activities of licensees or certified entities that subject qualified individuals with disabilities to discrimination on the basis of disability."

Anecdotal evidence shows that certain tests have disparate impact on individuals with disabilities (Mounty & Martin, 2005). The *Standards for Educational and Psychological Testing* developed by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (1999) includes chapters focusing on standards for approaching testing individuals of diverse linguistic backgrounds as well as individuals with disabilities that will limit the possibility of bias.

The Task Force has learned of a number of problems being encountered by current D/HH students and graduates who are being excluded from professional programs (or are being asked to leave once admitted) because they are thought to be unable to satisfy the exit competencies established by the licensing boards. In other words, the exit competencies are being used as entrance competencies and often are based on what Dr. Robert Pollard from the Deaf Wellness Center at the University of Rochester School of Medicine labels "organic" as opposed to "functional" competencies. Below is a summary of the issues related to these competencies, which were detailed within a larger document addressing discrimination in medical school practices involving D/HH students (R. Pollard, personal communication, June 6, 2011).

> Whether implied or overtly stated, the goal of writing technical standards is to ensure that candidates accepted into the school will be able to accomplish required tasks adequately through the curriculum, including caring for patients in a safe and effective manner. Ultimately, the goal is to produce qualified students who meet public and professional expectations within each health profession. Typically, technical standards documents will include phrasing that the performance criteria in question may be accomplished "with or without reasonable accommodations" as defined by the Americans with Disabilities Act (ADA). Inability to perform any of the technical standards is cause for denial of admission or graduation from professional health care educational institutions.
>
> The way many schools draft technical standards frequently creates discriminatory actions and results in unfortunate violations of the ADA. Schools typically will describe what sensory and physical abilities a student must possess as an integral part of how technical standards are written. This constitutes an "organic" approach to writing technical standards, in contrast to a "functional" approach.
>
> Functional technical standards set forth what the candidate or student must be able to accomplish, with or without reasonable accommodations, not how those tasks must be accomplished. Functional technical standards do not make reference to how well candidates or students must hear or see, or what motor or cognitive capacities they must possess in order to learn or provide patient care. It is incumbent on the candidates to demonstrate how they can accomplish those functions in light of whatever physical disabilities they may have.

How can health care and scientific institutions as well as businesses /corporations /industries/ professional organizations within health care fields be enlightened about the abili- ties of this potential workforce? And equally important, how can the institutional climate attract and support D/HH students and professionals so that these environments truly reflect a commitment to diversity?

There are resources for assisting potential employers who hire D/HH individuals. For example, JAN (Job Accommodation Network) is one of several services provided by the U.S. Department of Labor's Office of Disability Employment Policy (ODEP) (http://www.dol.gov/ odep/) whose goal is to provide information about workplace accommodations. JAN was developed through the collaborative efforts of ODEP, West Virginia University, and

private industries throughout North America. Further, ODEP has additional technical assistance resources specific to D/HH individuals, including the following:

1. Accommodation and Compliance Series: Employees who are Deaf or Hard-of-Hearing;
2. Searchable Online Accommodation Resource: Hearing Loss; Fact Sheet: Hearing Loss;
3. JAN Product Listing for Deaf/Hard-of-Hearing Impairments;
4. EEOC Fact Sheet: Questions and Answers About Deafness and Hearing Impairments in the Workplace and the Americans with Disabilities Act.

Disability.gov also provides information on technical assistance to identify and secure accommodations for employment for people with disabilities. Its employer resources site has information about recruiting, employing, and accommodating people with disabilities in the workplace (http://www.USA.gov) specific to these topics: employment laws & regulations, employing people with disabilities, small businesses resources, federal employer resources, tax information, workplace accommodations, customized employment, etc.

The Business Leadership Network (BLN) (http://www.usbln.org), a national non-profit business-to-business network that includes more than 60 affiliates nationwide, promotes the networking and hiring of persons with disabilities. It also serves as a third-party certification program for disability-owned businesses. The BLN demonstrates how other businesses can expand their diversity programs to include persons with disabilities and by example show them how to create a workplace of inclusivity.

Bender Consulting Services (http://www.benderconsult.com) is a placement business that recruits and hires persons with disabilities. Headquartered in Pittsburgh, Pennsylvania, it also has a company in Canada. Its philosophy is that hiring people with disabilities is a good business solution as well as "the right thing to do." The Sea Glass Group, a placement agency (http://theseaglassgroup.com), specializes in recruiting college and advanced degreed professionals with disabilities. Initially its clients were mobility impaired, but the company now recruits and places persons with hearing loss.

These resources notwithstanding, Task Force focus group and interview participants echoed continued concerns about employer practices and what employers need to know about D/HH health care providers. They also highlighted creative attempts to take advantage of a variety of current technologies to facilitate access, such as vibrating pagers, instant messaging, and videophones. The system, however, does not always make it easy for them or others in this regard, with employers lacking guidance and assistance on how to support D/HH applicants successfully in a cost-effective way. Also problematic are vague guidelines and laws, lack of awareness about accommodations, communication barriers with hearing co-workers and hearing clients, the difficulty of handling last-minute accommodation requests, the financial burden of providing accommodations, few promotion opportunities, and the relatively small pool of D/HH applicants.

Clearly, more attention to "employer awareness" is needed if D/HH individuals are to enter and succeed in health care careers. Health care organizations, health industry employers, and gatekeepers (people or organizations who provide guidance and/or allow access to a career field) need ongoing training about broad-based workforce diversity, the D/HH community, and the concept of universal design that is inclusive of the needs of people who are D/HH. Potential and current employers of D/HH individuals in the health care professions could benefit from learning about the skills and training available within this pool of employees, how access and technology have lowered the traditional communication barriers, and the overall benefits of having this diverse group of individuals in the health care workplace.

Goal III: Educational Experiences and Preparation

By 2022, D/HH students throughout the nation seeking postsecondary education in health care-related fields will have greatly expanded options, anchored by a ***Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students*** *and its collaborators.*

The Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students will be a national educational resource entailing degree programs as well as internship/practicum experiences for D/HH individuals pursuing a wide range of health care professions, with multiple entrance and exit points spanning associate-level degrees through master's degrees and advanced graduate-level degrees. It will conduct research on program effectiveness and also provide educational outreach regarding academic preparation, career information related to health care fields, employer awareness programs, and technical assistance to other postsecondary institutions throughout the country serving D/HH individuals in health care majors. Specifically, the CCOE's six goals will be to:

1. *Promote career awareness and academic skills development related to health care careers for middle and high school students;*
2. *Provide postsecondary educational preparation at a variety of degree and training levels;*
3. *Provide assistance to postsecondary institutions regarding policies and practices that ensure that admissions procedures for health care majors include fair consideration of D/HH applicants in conformance with ADA requirements;*
4. *Provide assistance to other postsecondary institutions serving D/HH individuals in health care majors on effective strategies for supporting the effective learning of D/HH students in health care educational settings;*
5. *Advocate for the linking of professional licensing and credentialing criteria to functional standards of professional competence as opposed to standards assuming or requiring a particular set of sensory or linguistic capabilities;*
6. *Enhance employer practices to support the success of D/HH health care employees.*

By 2022, an extensive national partnership among postsecondary institutions will have set up academic pathways to produce D/HH graduates in health care and will have identified health care employers dedicated to workplace diversity, and to increasing the recruitment, hiring, and career advancement of D/HH employees within health care settings.

Implementation Recommendation 3

In the June 2011 *Interim Report*, the Task Force suggested that the founding institutions explore the feasibility of a Consortium Center of Excellence for Health Care Education. By 2022, the CCOE should be an established program to lead D/HH students from middle school to post-doctoral fellowships in health care fields, thereby expanding the "pipeline" for more D/HH health care providers, scientists, and technical support personnel. This "pipeline" will serve as a model that can be replicated nationally.

Currently, the Centers of Excellence (COE) program, under the Public Health Services Act, authorizes health professions schools and Historically Black Colleges and Universities to establish Centers; the designated health professions schools are schools of allopathic medicine, osteopathic medicine, dentistry, pharmacy, and graduate programs in behavioral or mental health. To follow and qualify under existing guidelines, only the health professions schools in the COE can qualify for funding. However, these professional schools may be able to allocate grant funds to other members of the Consortium to provide needed services to the COE. These needed services include those that will support underrepresented minorities and ensure that the focus on underrepresented minority students remains until they graduate with degrees in the health professions.

We recommend that the four founding institutions explore opportunities for securing support for extending Centers of Excellence to include D/HH representation through the Consortium Center of Excellence in Health Care Careers, which might include Gallaudet, RIT/NTID, URMC, RGHS, and other local and national partners as designated. Specifically, the recommendation is to amend the legislation authorizing the COE program to include Centers of Excellence for D/HH students comparable to the Centers for certain Historically Black Colleges and Universities, Hispanic Centers of Excellence, and Native American Centers of Excellence; and/or to establish a separate COE program for schools serving D/HH students comparable to the current COE program as legislated.[12]

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[12] According to the U.S. Department of Health and Human Services Bureau of Health Professions (Proposed Eligibility Criteria for the Centers of Excellence Programs in Health Professions, 2011), the COE legislation as it currently stands specifically states that underrepresented minority individuals means:

> Racial and ethnic populations that are underrepresented in the designated health profession discipline relative to the number of individuals who are members of the population involved. This definition would include Black or African American, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Hispanic or Latino and any Asian other than Chinese, Filipino, Japanese, Korean, Asian Indian or Thai [Public Health Services Act, Section 799B(10)].

It should be noted that the Centers for Excellence Program was added to the Public Health Services Act by Public Law No. 106-525, the Minority Health and Health Disparities Research and Education Act of 2000. Section 602 of the Act specifies that for the purposes of this Act, the term "racial and ethnic minority group has the meaning given such term in section 1707 of the Public Health Services Act." Consequently, this gives great weight to the need to devote efforts to the possibility of amending the legislation to include schools serving D/HH students or establishing a comparable program for such schools. It should also be noted that some federal agencies, including NSF and NIH, are believed to consider disability when reviewing grants to increase the number of underrepresented minorities in scientific research (http://grants.nih.gov/training/faq_diversity.htm).

Implementation Recommendation 4

The Task Force recommends that the CCOE work with institutions across the country to develop complementary programs and "pipelines" that will facilitate increased access to health career options for D/HH individuals. The CCOE will offer technical assistance to other educational institutions nationally regarding the preparation of D/HH individuals for health care professions. This assistance will include, but not be limited to, best practices in the development of STEM skills, academic support services, retention practices, accessibility options, and appropriate research findings (as outlined in Implementation Recommendation 7, p. 53).

Implementation Recommendation 5

The Task Force recommends that the CCOE take the lead in modeling admissions processes for D/HH individuals that minimize bias and serve as a national example for other institutions around the country. At minimum, the CCOE should:

- Based on research to be conducted , develop and disseminate statements regarding the value and benefits of training D/HH individuals in health care fields, with particular focus on the cultural competence this group brings and the institutional diversity achieved by including significant numbers of D/HH individuals;
- Provide training for admission committee members and others with gatekeeper responsibilities from other institutions about the importance of D/HH applicants to the overall institutional and health care mission and ways to include culturally competent faculty in the admissions process.

Implementation Recommendation 6

The Task Force further recommends that the CCOE forge partnerships with the National Association of Nurses with Disabilities, Association of Medical Professionals with Hearing Losses, the American Medical Association, the American Psychological Association, the National Dental Association, and other pertinent national groups investigating bias and inequity in the licensing and credentialing of health care providers. In addition to examining the licensing and credentialing processes for possible bias, these organizations can assist with developing specific strategies to encourage all health care educational institutions to re-evaluate and revise their standards in a functional manner as opposed to an organic approach. Consistent with one of the major themes in this Task Force report, this effort is part of an overall civil rights orientation to the recommendations, as the creation of functional standards can benefit not only D/HH individuals, but all individuals, including those individuals with disabilities.

Implementation Recommendation 7

The Task Force recommends that the CCOE, in collaboration with the Sponsored Research/ Policy Committee, whose establishment was recommended in the *Interim Report* (Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, 2011, pp. 24-25):

- Encourage the development of innovative educational programs and policies that foster development of academic readiness skills of D/HH students to enter health care professions;
- Conduct and foster research and development on technologies, practices, and innovations that further the education of D/HH individuals in health care careers;
- Record information documenting initiatives made by the CCOE as well as partnering institutions and maintain a database to assist researchers in assessing and documenting the impact of practices, technologies, and CCOE-sponsored initiatives in the D/HH community;
- Collect research data on the design of educational programs using functional standards in order to provide an evidence base for funding applications and develop strategies for collecting research data on the effectiveness of the change to more functional standards.

Implementation Recommendation 8

The four founding institutions should approach the departments of Health and Human Services, Education, and Labor regarding allocating funds to entities that could collaborate on the development of visual and written materials (DVDs, manuals) and curricula to train D/HH students in workforce readiness and health care employers in best hiring practices. Examples include training for interview competence and encouraging employers to adopt technologies and communication strategies that will benefit not only D/HH individuals, but all employees.

Implementation Recommendation 9

The CCOE will gather and disseminate "best practice" experiences of employers who successfully integrate members of the D/HH community into meaningful careers and create a positive work environment. Working in collaboration with existing organizations such as JAN and government disability offices, and drawing on the experience of the NTID and

Gallaudet career centers, the CCOE also should maintain and make available a list of businesses and organizations that have successfully integrated D/HH employees into their workforce to be used as a resource for others.

Human resource offices and hiring managers of all allied health providers should be provided not only with ADA rules, but also with brochures whose links will explain the strengths of hiring D/HH workers and detail practical methods of best workforce practices. Many employers are not aware of the range of possible supports or adaptations available to them if they hire D/HH employees. Without this awareness, employers often make false assumptions about the capabilities of D/HH individuals to function in their work environments or what costs are associated with hiring D/HH health care workers. Conversely, the prospective job-seeking D/HH individual needs to be proactive in providing information to the employer about what resources are available in order to address "upfront" what possible adaptations could make the hiring situation mutually advantageous. Both sides need clear, accurate, and up-to-date accessibility information packaged in a user-friendly form. Appropriate educational preparation and effective training can result in more persons with disabilities entering and succeeding in the workplace, as emphasized by the U.S. Office of Disability Employment Policy.

The Task Force has had the wonderful opportunity of learning about "pioneers" who have broken through the educational barriers and succeeded in the health care arena as indicated in this report. Many others aspire to the same goal, but face a future of uncertainty regarding their possibilities. The Task Force hopes that its recommendations targeted to education and employer awareness will make more D/HH individuals able to make their dreams of becoming health care providers a reality.

Stymied by Bureaucratic Barriers

Adebowale "Debo" Ogunjirin, 42, of Woodbridge, VA, was born in Nigeria and became deaf at age 9 due to illness. Motivated, skilled, and knowledgeable, he graduated from Nigeria's premier university, the University of Ibadan, in 1995 with a bachelor's degree in Pharmacology.

"At that time, college education for deaf students was barely supported by Nigeria," Ogunjirin says. "So I had to do most of the studies on my own."

He thrived by attending classes to familiarize himself with the topics discussed and then laboriously copying notes from classmates and managing all of his reading on his own. He used this same method to earn a master's degree in Pharmaceutics and Pharmaceutical Technology from the University of Lagos, also in Nigeria.

"I fell in love with Pharmacology because it exposes me to a diversity of fields of study, from plants to animals," he says.

After working as a pharmacist for five years in Lagos, Ogunjirin came to the United States in 2005 to earn his Ph.D. But he has been unable to work in his chosen field because he does not yet have a U.S. license to dispense medication.

His efforts have been stymied by the misunderstandings and misconceptions that can make pursuing a health care career so difficult for deaf people.

"As a rule, the American Pharmacy Board must certify internationally awarded certificates in Pharmacy," he says. "I met all of their criteria to be certified, including taking the written examinations without a special assistant. Then I was informed that I couldn't be certified because I was unable to meet the oral requirement in spoken English."

Through negotiations and the threat of legal action, the board, after several years, agreed to certify him.

"The Pharmacy Board that regulates the practice of pharmacy in this country has yet to come to terms with the evolving world of the deaf," he concludes.

His efforts to obtain an internship – a prerequisite for foreign-trained pharmacists licensed in the U.S. – so far have been unsuccessful.

"Students at the local institutions normally satisfy this requirement before graduation," he says. "My inability to secure a place for more than two years now indicates that the job market, though ripe for pharmacists, is not receptive to the idea of a deaf pharmacist."

Ogunjirin now works as a temporary instructor of Biology at Gallaudet University in Washington, DC and continues trying to reach his dream of becoming a Pharmacist in this country.

Persevering Against Doubts

Dr. Michael McKee, 35, assistant professor of Family Medicine at the University of Rochester (NY) Medical Center, is passionate about his career and about the possibilities for deaf people in health care.

"Family medicine is unique due to its focus on the biopsychosocial aspect of our patients," he says. "It is fun caring for the entire family – from the grandchild to the grandmother. My hearing loss has given me compassion to work with patients struggling with various health issues."

McKee faced his share of those who doubted that someone with a profound hearing loss could succeed in health care.

"Some faculty members felt that I did not belong in medicine. They saw my deafness as a 'major handicap' that would prevent me from helping patients."

McKee was born in Tampa, FL, and identified with a profound hearing loss at age 2½. He had years of speech therapy growing up and began learning sign language in his teens.

"My parents were my teachers and my supporters," he says. "They permitted me to develop a love of learning that allowed me to excel in college and medical school."

In 1997, he entered Lynn University, where he began using accommodation services--first notetakers, and then when he became more comfortable with ASL, sign language interpreters in medical school.

The interpreters helped him navigate the variety of settings and the large groups he faced in his medical studies.

"Interpreters allowed me to learn in a group format very effectively. Medical students go through clinical rotations, which can vary widely from the operating room to the outpatient room."

Deaf role models also played an important part in McKee's journey. They encouraged him to expand his possibilities as a teenager and helped him find suitable assistive stethoscopes as a practicing physician.

"They taught me that the world is only limited by your perspective of it," he says.

McKee believes strongly that rapidly advancing technology "is a boon for Deaf people interested in health care careers. This will enable more barriers to be broken down."

"However," he cautions, "a strong foundation in education can never be substituted.

"It is important to recognize that many doubts are rooted in ignorance," he says. "Take the time to educate people and listen to their concerns. By showing your passion for your work, you will convert a few of them to becoming your supporters and champions."

Chapter 4:
Assuring Progress in Increasing the Number and Success of D/HH Individuals in Health Care Fields

Background and Context

A core principle recognized by the Task Force is that a successful approach to increasing the number and success of D/HH individuals in health care fields will require a universal design orientation in which solutions to barriers will benefit D/HH individuals, hearing individuals, and the "system" as a whole. Such a principle follows the basic tenet of the *social* model, which postulates that individuals are disabled by their environment (e.g., environmental and/or access barriers to education and gainful employment) in contrast to the *medical* model, which focuses on inherent characteristics of the person with a disability (American Psychological Association, 2012; Stein & Teplin, 2011; World Health Organization, 2001). Solutions with universal design should be part of the social fabric that accommodates and benefits everyone. Texting devices and captioning are prime examples of how an accommodation for D/HH individuals has an equally useful function for the general population. This ultimately should result in increased productivity in a society where hearing and D/HH individuals interact and function fully as citizens. Obviously, accomplishing this vision will require funding and policy support from local, state, and federal governments. Some of the possible funding mechanisms and suggestions for addressing legislative and policy issues already have been discussed in this report. In addition to these ideas, a rigorous and comprehensive research program will be critical in terms of gauging the effectiveness of both short-and long-term interventions initiated by the partnering institutions and informing future policy development. Again, specific recommendations for such research have been outlined in previous chapters and are expanded here.

Solutions with universal design should be part of the social fabric that accommodates and benefits everyone.

Efforts by the founding institutions to implement the previously approved short-term solutions (see Appendix VI, p.114, for a summary of the *Interim Report*) will ensure that pilot data have been collected and discussions with administrators and project officers from various federal and local agencies have begun. These efforts will enable applications for funding to support both research and training programs in support of long-term goals.

The recommendations in this section emphasize strategies designed to ensure that D/HH individuals continue to advance into and within the health care provision system and that the initiatives undertaken by the four founding institutions make a sustained and expanding difference in the career trajectory of D/HH persons. While the previous two chapters have addressed access and educational initiatives, this chapter focuses on additional initiatives that can facilitate the coordination and continuation of all Task Force Implementation Recommendations.

Goal IV: Assuring Focus and Progress

To achieve the goal of significantly increasing the number and success of D/HH individuals entering health care training and employment, the Task Force envisions a 10-year action plan focusing on Access/Technology Services, Educational Experiences and Preparation, and Assuring Progress for D/HH individuals in Health Care Careers. This plan is anchored by four organizational engines that will help realize this goal. They are:

- *The National Center on Access Services Innovation and Consultation for Deaf and Hard-of-Hearing Health Care Students and Professionals (NCAS), as outlined in Chapter 2 of this report, is a national research and development resource for advancing technological innovation in providing access services for D/HH students and professionals in health care settings. It serves as an "incubator" for private/public partnerships in the development, manufacturing, and commercialization of access services technologies. It also provides consultation to health care-related educational institutions and employers throughout the country regarding optimal solutions (in terms of effectiveness and cost efficiency) for delivering access services to D/HH participants;*

- *The Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students, as outlined in Chapter 3 of this report, is a national educational resource (entailing degree programs as well as internship/practicum experiences) for D/HH individuals pursuing a wide range of health care professions, with multiple entrance and exit points spanning associate-level degrees through master's degrees and advanced graduate-level degrees. It also provides educational outreach to middle school through high school D/HH students and their teachers regarding academic preparation and career information related to health care fields, as well as technical assistance to other postsecondary institutions throughout the country serving D/HH individuals in health care majors. The CCOE also will conduct research in collaboration with the Sponsored Research/Policy Development Committee on topics ranging from innovative educational programs to assessment of admissions/credentialing approaches to critical data collection about the success of students in health-related programs. It also will be responsible for employer awareness programs cultivating productive organizational environments and relationships among D/HH professionals within health care settings;*

- *The Sponsored Research/Policy Development Committee (recommended as part of the short-term recommendations made in the* Interim Report, *p. 24) reflects a collaboration among the four founding institutions focused on externally funded research and the resulting implications for policy development related (but not limited) to health care education, employment, and career advancement for D/HH individuals. This committee will consider: a) instructional and curricular innovation related to health care preparation and professional development; b) technological advancements in the provision of access services related to health care preparation and professional development; and c) employment outcomes and career trajectories related to health care careers;*

- *The National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals (NAGHCC), which is outlined in the following Implementation Recommendation, is a national entity that will have the overall function of assuring continued focus and progress toward achieving the short- and long-term recommendations made by the Task Force.*

These four organizational entities are designed to ensure that there continues to be advancement for D/HH individuals within the health care system and that the initiatives undertaken by the four founding institutions are making a sustained and expanded difference in the career trajectory of D/HH persons. These national entities will have ongoing, close interactions with one another and will be supported by some combination of the four founding institutions along with other local, state, regional, national, and federal partners. The structural relations among these four entities will be developed and formalized based on the experiences/outcomes of implementing the Task Force's (2011) Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report.

Implementation Recommendation 10

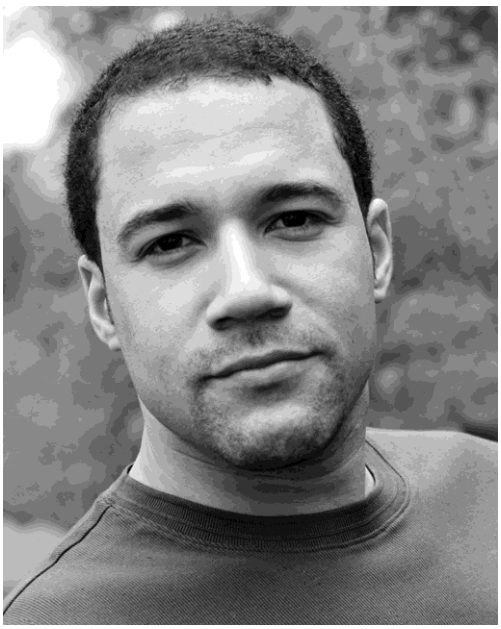
By 2012-13, a **National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals (NAGHCC)** will be formed through partnership among the founding institutions and an appropriate national non-profit professional advocacy organization. This Group will include representation from other postsecondary institutions, the health care industry, and federal and state agencies. The four founding institutions should allocate development resources to search for funding sources for the NAGHCC to convene on a regular basis. Further, any initiatives proposed by the NAGHCC should be accompanied by a plan for funding.

The Group's focus will be to advance the Task Force's *Final Report* Implementation Recommendations with respect to education, research, communication access services and related technological innovation, employer and public awareness, and policy reform. In addition, it will advise the four founding institutions on progress regarding the short- and long-term interventions, and assist where possible with advocacy in funding and policy support from state, local, and federal governments in carrying out the Task Force's recommendations. The NAGHCC will receive regular reports from all existing entities responsible for implementation of Task Force recommendations, namely The National Center on Access Services Innovation and Consultation for Deaf and Hard-of-Hearing Health Care Students and Professionals (NCAS), the Consortium Center of Excellence (CCOE) in Health Care Careers for Deaf and Hard-of-Hearing Students, and the Sponsored Research/Policy Development Committee; and will work closely with appropriate staff at the four institutions to advise on best strategies for accomplishing Vision 2022.

The NAGHCC will ensure that the efforts begun by the Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community to increase the numbers and success of D/HH individuals in the health care industry will continue in an effective way. It is anticipated that the four sponsoring institutions and their allied partners will have access to the skills and knowledge of this group in order to advance the health care training and employment initiatives recommended in both the *Interim* and *Final Reports*.

Inspiring New Students

The first person in his family to graduate from college, Dr. Raymond Merritt, 37, feels blessed for having a multitude of role models to inspire him – and to now be inspiring others.



Deaf since birth, Merritt now has a master of science degree and a doctorate in Neuroscience and is an associate professor of Biology at Gallaudet University.

"The original impetus for my pursuit of a Ph.D. degree was the motivation I got from my family and mentors," he says, adding, "My parents gave me full support in everything."

A native of southern California, Merritt attended mainstream schools before enrolling at the California School for the Deaf Riverside (CSDR) when he was 9 years old. A committed student and outstanding athlete, he graduated at the top of his class at just 16 years of age.

Merritt remembers CSDR fondly. "There were sports, film studies, leadership studies, travel opportunities, and many, many role models," he says.

He spent two years after high school taking courses in automotive mechanics and physical training before enrolling at Gallaudet.

"I am a very analytical person and saw Biology as having a lot in common with my other interests, such as athletics, engineering, and automotive technology.

"Also, since I came from a low socio-economic family background, I wanted not just a challenging job but a secure one. I knew that Biology is in high demand."

After more years of academic excellence and athletic stardom at Gallaudet, Merritt was named a Gallaudet Presidential Fellow, which enabled him to study for and receive a master's degree in Genetics from George Washington University. He followed that with a doctorate in Neuroscience from the University of Maryland.

Of his graduate studies, Merritt says, "The stigma of deafness comes and goes. It was often difficult to distinguish between people doubting me because I am deaf or treating me like any other lowly Ph.D. student."

He admits that it helped not to limit himself to one communication method for conveying messages to a broader, hearing audience. "Don't be afraid to try new, innovative ways of communicating."

And the truth that one generation inspires another and that the success of one deaf person leads to the success of others is especially meaningful to Merritt, whose deaf mother was so inspired by his success that she, too, enrolled at and graduated from Gallaudet.

Conclusion

I tried to be promoted to be a supervisor or leader… I had been there longer than anyone else; I had seniority…. For some reason I was turned down each time, even though I was able and qualified to do the job. I didn't have the courage to ask directly why I was denied the job. I didn't know if it was a discriminatory issue or another issue….. I never asked. (Trish Nolan, Medical Records Technician, 2010)

I applied initially to one particular clinic [for an internship]…. I had a wonderful experience; no problems at all. They said, 'When you're ready to apply, see us.' I felt really good about that. Upon graduation in 2001, I did apply for a job and had an interview…and about a week later, I got a letter saying, 'We're sorry, you've been denied; you don't meet the physical qualifications ….' Obviously, that was a case of discrimination. (Sara Gerdtz, Registered Nurse, 2010)

Throughout its 18 months of research, inquiry and discussion, the Task Force repeatedly saw the limitations and barriers often imposed on D/HH individuals in health care fields. In spite of these obstacles, some D/HH individuals have succeeded as medical doctors, nurse practitioners, lab technicians, medical records technicians, pharmacists, dentists, oral hygienists, research scientists, and psychologists, among others. These individuals are true pioneers. They reveal the possibilities for success if the opportunities are there. Their success stories, however, do not mirror the experience of most D/HH individuals. This speaks to the limited opportunities for many in this group and the need to confront and creatively respond to barriers that hinder training and employment opportunities.

The excerpts from Trish Nolan and Sara Gerdtz represent an urgent call to change the paradigm that has existed and to aggressively begin efforts to enhance the occupational outlook for this group of talented and underutilized individuals. Following on the heels of efforts to enhance the number of minority individuals in the health care field, the effort to enhance the number of D/HH health care workers is a challenge whose time has come. The vision set forth by the Task Force is ambitious and far-reaching. It encourages concerted actions to ensure that qualified D/HH individuals throughout the nation will have equitable access to training, employment, and career advancement across a wide variety of health care occupations that match their aspirations. Qualified D/HH individuals must be regarded as capable of providing quality health care services and cannot be limited in training and employment

opportunities due to inaccurate perceptions about their abilities and communication barriers. The Task Force envisions that success stories no longer will be the exception, but will represent achievable dreams for future D/HH individuals in our country.

The Vision, Goals and Implementation Recommendations of this *Final Report* represent a proposed 10-year plan to accomplish such a paradigm shift, starting with the implementation of the Task Force's (2011) *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report* now underway. The Task Force is confident that both sets of initiatives will culminate in increasing the diversity of our national workforce in health care fields and in making the industry more responsive not just to the needs of D/HH patients/clients, but to the needs of all patients. More important, these initiatives ensure the fullest economic return to society from D/HH citizens and uphold our national commitments to civil rights and social justice.

The Task Force envisions that success stories no longer will be the exception, but will represent achievable dreams for future D/HH individuals in our country.

Task Force meeting January 2012

Not Just For Me

Dr. Carolyn Stern, 47, a Family Practice physician in Rochester, NY, was born with a severe to profound hearing loss. The Potomac, MD, native, grew up with a healthy respect for doctors and health care professionals. She loved her high school Anatomy and Physiology courses, and decided that she wanted a career "where I could serve others and give back to those who cared for me while I was growing up."

At Case Western Reserve University, she notified professors about her hearing loss and sat up front in classes. If she had questions or problems, she worked with other students or met with her professors.

During medical school, she met some resistance about receiving support services and took legal action in order to continue to receive them. At that moment, the importance of self-advocacy, a strong support network, and knowledge about legal safeguards all became apparent.

Stern used Section 504 of the Rehabilitation Act of 1973 and the Office of Civil Rights to get the support she needed; and a positive outcome was that her school then set up an Office for Students with Disabilities.

"I believed strongly that my 'paving the way' was not just for me, but for anyone else who wished to choose medicine or healthcare as a career," she says.

She adds, "I had a tremendous support network. I believe that being flexible, persistent, and having a sense of humor helped a great deal—it still does!"

Stern today is a family physician working in Urgent Care; Medical Director and School Physician at the Rochester School for the Deaf; co-founder of DeafDOC.org, a website that provides health-related information; course instructor at RIT/NTID, and consultant to many organizations.

She remains mindful of the barriers and doubts she faced – and continues to face-- even today.

"Physicians must take a minimum of 50 hours per year of continuing medical education coursework to maintain their licenses," she says. "I have applied to programs and paid course and travel fees only to be informed that the section of the conference that I wished to take was 'cancelled.'"

So the work of educating others and advocating for herself and other deaf people in health care professions continues.

"Ideally, deaf or hard-of-hearing people desiring health care careers would have the means AND opportunity to pursue their dreams, and be treated as a valued member of society -with respect, just like anyone else," she says.

Tables and Figures

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Table 1 Differences in the Types of Health Care Occupations Between D/HH Persons and Hearing Persons Employed in the Health Care Industry

Occupations		D/HH (N-=52,857)	Hearing (N- 4,311,880)	Difference[13]
MED	Registered Nurses	16.6%	20.4%	-3.8%
MED	Physicians and Surgeons	4.0%	6.2%	-2.2%
HLS	Medical Assistants	1.9%	3.0%	-1.1%
HLS	Dental Assistants	1.1%	2.0%	-0.9%
MED	Physical Therapists	0.8%	1.4%	-0.7%
SC I	Medical Scientists, and Life Scientists, all other	0.4%	1.0%	-0.6%
MED	Diagnostic Related Technologists and Technicians	1.7%	2.3%	-0.6%
MED	Clinical Laboratory Technologists and Technicians	2.0%	2.5%	-0.5%
MED	Speech-Language Pathologists	0.5%	0.9%	-0.5%
MED	Dental Hygienists	0.7%	1.1%	-0.4%
MED	Pharmacists	1.4%	1.8%	-0.4%
MED	Health Practitioner Support Technologists and Technicians	3.2%	3.4%	-0.2%
MED	Optometrists	0.1%	0.3%	-0.2%
MED	Occupational Therapists	0.5%	0.7%	-0.2%
HLS	Physical Therapist Assistants and Aides	0.3%	0.5%	-0.2%
HLS	Veterinary Assistants and Laboratory Animal Caretakers	0.1%	0.2%	-0.1%
SC I	Biological Scientists	0.5%	0.6%	-0.1%
MED	Dentists	1.0%	1.2%	-0.1%
MED	Physician Assistants	0.7%	0.8%	-0.1%
MED	Miscellaneous Health Technologists and Technicians	0.8%	0.9%	-0.1%
MED	Veterinarians	0.5%	0.6%	-0.1%
MED	Dietitians and Nutritionists	0.6%	0.7%	-0.1%
MED	Nurse Anesthetists	0.1%	0.2%	-0.1%
MED	Podiatrists	0.0%	0.1%	-0.1%
HLS	Medical Transcriptionists	0.5%	0.5%	-0.1%

[13] Minus sign indicates a higher percentage of hearing health care workers than D/HH workers. No sign indicates an equal number or higher percentage of D/HH than hearing health care workers.

Occupations		D/HH (N-=52,857)	Hearing (N- 4,311,880)	Difference[13]
MED	Health Diagnosing and Treating Practitioners, all other	0.1%	0.2%	-0.1%
MED	Nurse Practitioners, and Nurse Midwives	0.7%	0.7%	0.0%
MED	Radiation Therapists	0.1%	0.1%	0.0%
MED	Other Therapists, Including Exercise Physiologists	1.0%	1.0%	0.0%
MED	Recreational Therapists	0.1%	0.1%	0.0%
HLS	Occupational Therapy Assistants and Aides	0.1%	0.1%	0.0%
SC I	Psychologists	1.3%	1.3%	0.0%
HLS	Health care Support Workers, all other, Including Medical Equipment Preparers	1.1%	1.0%	0.1%
MED	Audiologists	0.2%	0.1%	0.1%
CMS	Miscellaneous Community and Social Service Specialists, Including Health Educators and Community Health Workers	0.8%	0.7%	0.1%
HLS	Pharmacy Aides	0.3%	0.3%	0.1%
MED	Opticians, Dispensing	0.5%	0.4%	0.1%
HLS	Massage Therapists	1.2%	1.1%	0.1%
MED	Respiratory Therapists	0.9%	0.8%	0.1%
MED	Medical Records and Health Information Technicians	0.9%	0.8%	0.1%
SC I	Agricultural and Food Science Technicians	0.4%	0.2%	0.1%
SC I	Biological Technicians	0.3%	0.1%	0.2%
SC I	Miscellaneous Life, Physical, and Social Science Technicians, including Social Science Research Assistants	1.2%	1.0%	0.2%
MED	Licensed Practical and Licensed Vocational Nurses	5.3%	5.0%	0.2%
HLS	Phlebotomists	1.0%	0.8%	0.3%
SC I	Agricultural and Food Scientists	0.6%	0.2%	0.4%
CMS	Social and Human Service Assistants	1.6%	1.1%	0.5%
MED	Other Health Care Practitioners and Technical Occupations	1.2%	0.6%	0.6%
CMS	Social Workers	6.9%	6.2%	0.8%
MED	Emergency Medical Technicians and Paramedics	2.0%	1.2%	0.8%

[13] Minus sign indicates a higher percentage of hearing health care workers than D/HH workers. No sign indicates an equal number or higher percentage of D/HH than hearing health care workers.

Occupations		D/HH (N-=52,857)	Hearing (N- 4,311,880)	Difference[13]
CMS	Counselors	7.5%	5.1%	2.4%
HLS	Nursing, Psychiatric, and Home Health Aides	23.0%	16.4%	6.5%

Source: US Census Bureau (2010a)

[13] Minus sign indicates a higher percentage of hearing health care workers than D/HH workers. No sign indicates an equal number or higher percentage of D/HH than hearing health care workers.

Table 2 Employment Projections 2008 to 2018: Health Care Industries Separate from Other Industries

[7,214.9 represents 7,214,900. Estimates based on the Current Employment Statistics program. See source for methodological assumptions. Minus sign (-) indicates decline]

Health Care Organizations	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
LARGEST GROWTH				
Offices of health practitioners	3,713.3	4,978.6	1,265.3	3.0
Management, scientific, and technical consulting services	1,008.9	1,844.1	835.2	6.2
Nursing and residential care facilities	3,008.0	3,644.8	636.8	1.9
Hospitals	4,641.2	5,191.9	550.7	1.1
Individual and family services	1,108.6	1,638.8	530.2	4.0
Home health care services	958.0	1,399.4	441.4	3.9
Outpatient, laboratory, and other ambulatory care services	989.5	1,297.9	308.4	2.8
FASTEST GROWTH				
Management, scientific, and technical consulting services	1,008.9	1,844.1	835.2	6.2
Individual and family services	1,108.6	1,638.8	530.2	4.0
Home health care services	958.0	1,399.4	441.4	3.9
Offices of health practitioners	3,713.3	4,978.6	1,265.3	3.0
Personal care services	621.6	819.1	197.5	2.8
Outpatient, laboratory, and other ambulatory care services	989.5	1,297.9	308.4	2.8
Scientific research and development services	621.7	778.9	157.2	2.3

Health Care Educational and Professional Services	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
LARGEST GROWTH				
General local government educational services compensation	8,075.6	8,728.3	652.7	0.8
Other educational services	578.9	894.9	316.0	4.5
Junior colleges, colleges, universities, and professional schools	1,602.7	1,857.4	254.7	1.5
FASTEST GROWTH				
Other educational services	578.9	894.9	316.0	4.5
Elementary and secondary schools	854.9	1,089.7	234.8	2.5

Non-Health Care Organizations	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
LARGEST GROWTH				
Construction	7,214.9	8,552.0	1,337.1	1.7
Food services and drinking places	9,631.9	10,370.7	738.8	0.7
Computer systems design and related services	1,450.3	2,106.7	656.4	3.8
Retail trade	15,356.4	16,010.4	654.0	0.4
Employment services	3,144.4	3,744.1	599.7	1.8
Services to buildings and dwellings	1,847.1	2,182.6	335.5	1.7
Architectural, engineering, and related services	1,444.7	1,769.5	324.8	2.0
Other educational services	578.9	894.9	316.0	4.5
Wholesale trade	5,963.9	6,219.8	255.9	0.4
Legal services	1,163.7	1,416.8	253.1	2.0
General government, other compensation	4,224.1	4,464.0	239.9	0.6

Non-Health Care Organizations	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
FASTEST GROWTH				
Specialized design services	143.1	208.7	65.6	3.8
Data processing, hosting, related services, and other information services	395.2	574.1	178.9	3.8
Computer systems design and related services	1,450.3	2,106.7	656.4	3.8
Lessors of nonfinancial intangible assets (except copyright works)	28.2	37.9	9.7	3.0
Facilities support services	132.7	173.6	40.9	2.7
Software publishers	263.7	342.8	79.1	2.7
Independent artists, writers, and performers	50.4	64.8	14.4	2.5
Local government passenger transit	268.6	342.6	74.0	2.5
Waste management and remediation services	360.2	451.0	90.8	2.3
Other miscellaneous manufacturing	321.0	399.4	78.4	2.2
Community and vocational rehabilitation services	540.9	672.0	131.1	2.2

Source: Woods (2009)

Table 3 List of Different Occupations Held by Individuals Employed in the Health Care Industry

In Health Care Industry
HLS - Dental Assistants
HLS - Health Care Support Workers, all other, Including Medical Equipment Preparers
HLS - Massage Therapists
HLS - Medical Assistants
HLS - Medical Transcriptionists
HLS - Nursing, Psychiatric, and Home Health Aides
HLS - Occupational Therapy Assistants and Aides
HLS - Pharmacy Aides
HLS - Phlebotomists
HLS - Physical Therapist Assistants and Aides
HLS - Veterinary Assistants and Laboratory Animal Caretakers
MED - Audiologists
MED - Chiropractors
MED - Clinical Laboratory Technologists and Technicians
MED - Dental Hygienists
MED - Dentists
MED - Diagnostic Related Technologists and Technicians
MED - Dietitians and Nutritionists
MED - Emergency Medical Technicians And Paramedics
MED - Health Diagnosing and Treating Practitioners, all other
MED - Health Practitioner Support Technologists and Technicians
MED - Licensed Practical and Licensed Vocational Nurses
MED - Medical Records and Health Information Technicians
MED - Miscellaneous Health Technologists and Technicians
MED - Nurse Anesthetists
MED - Nurse Practitioners, and Nurse Midwives
MED - Occupational Therapists

In Health Care Industry
MED - Opticians, Dispensing
MED - Optometrists
MED - Other Health care Practitioners and Technical Occupations
MED -Other Therapists, Including Exercise Physiologists
MED - Pharmacists
MED - Physical Therapists
MED - Physician Assistants
MED - Physicians and Surgeons
MED - Podiatrists
MED -Radiation Therapists
MED - Recreational Therapists
MED - Registered Nurses
MED - Respiratory Therapists
MED - Speech-Language Pathologists
MED - Veterinarians
MED - Audiologists
MED - Chiropractors
MED - Clinical Laboratory Technologists and Technicians
MED - Dental Hygienists
MED - Dentists
MED - Diagnostic Related Technologists and Technicians
MED - Dietitians And Nutritionists
MED - Emergency Medical Technicians and Paramedics
MED - Health Diagnosing and Treating Practitioners, all other
MED - Health Practitioner Support Technologists and Technicians
MED - Licensed Practical and Licensed Vocational Nurses
MED - Medical Records and Health Information Technicians
MED - Miscellaneous Health Technologists and Technicians

In Health Care Industry
MED - Nurse Anesthetists
MED - Nurse Practitioners, and Nurse Midwives
MED - Occupational Therapists
MED - Opticians, Dispensing
MED - Optometrists
MED - Other Health care Practitioners and Technical Occupations
MED - Other Therapists, Including Exercise Physiologists
MED - Pharmacists
MED - Physical Therapists
MED - Physician Assistants
MED - Physicians and Surgeons
MED - Podiatrists
MED - Radiation Therapists
MED - Recreational Therapists
MED - Registered Nurses
MED - Respiratory Therapists
MED - Speech-Language Pathologists
MED - Veterinarians
MGR - Medical and Health Services Managers
MGR - Education Administrators
MGR - Computer and Information Systems Managers
MGR - Food Service Managers
MGR - Emergency Management Directors
MGR - Funeral Service Managers
MGR - Natural Sciences Managers
MGR - Social and Community Service Managers
MGR - Training and Development Managers
MGR - Transportation, Storage, and Distribution Managers

In Health Care Industry
OFF - Data Entry Keyers
OFF - Billing and Posting Clerks
OFF - Bookkeeping, Accounting, and Auditing Clerks
OFF - Computer Operators
OFF - Correspondence Clerks and Order Clerks
OFF - File Clerks
OFF - Financial Clerks, all other
OFF - Library Assistants, Clerical
OFF - Human Resources Assistants, Except Payroll and Timekeeping
OFF - Mail Clerks and Mail Machine Operators, Except Postal Service
OFF - Miscellaneous Office and Administrative Support Workers, Including Desktop Publishers
OFF - Office Clerks, General
OFF - Procurement Clerks
OFF - Receptionists and Information Clerks
OFF - Secretaries and Administrative Assistants
OFF - Statistical Assistants
OFF - Word Processors and Typists
OFF - Weighers, Measurers, Checkers, and Samplers, Recordkeeping
OFF - Telephone Operators
PRD - Medical, Dental, and Ophthalmic Laboratory Technicians
PRD - Chemical Processing Machine Setters, Operators, and Tenders
PRD - Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders
PRD - Crushing, Grinding, Polishing, Mixing, and Blending Workers
PRD - Cutting Workers
PRD - Electrical, Electronics, and Electromechanical Assemblers
PRD - Medical, Dental, and Ophthalmic Laboratory Technicians
PRD - Painting Workers
PRD - Childcare Workers

In Health Care Industry
PRD - Inspectors, Testers, Sorters, Samplers, and Weighers
PRD - Jewelers and Precious Stone and Metal Workers
PRD - Laundry and Dry-Cleaning Workers
PRS - First-Line Supervisors Of Personal Service Workers
PRS - Morticians, Undertakers, and Funeral Directors
PRS - Nonfarm Animal Caretakers
PRS - Personal Care Aides
PRS - Personal Care and Service Workers, all other
PRS - Recreation and Fitness Workers
PRT - Detectives and Criminal Investigators
PRT - Fire Inspectors
PRT - Firefighters
PRT - First-Line Supervisors Of Fire Fighting and Prevention Workers
PRT - First-Line Supervisors Of Protective Service Workers, all other
PRT - Lifeguards and other Recreational, and all other Protective Service Workers
RPR - Precision Instrument and Equipment Repairers
RPR - Radio and Telecommunications Equipment Installers and Repairers
SAL - Sales Engineers
SAL - Sales Representatives, Services, all other
SCI - Astronomers and Physicists
SCI - Agricultural and Food Science Technicians
SCI - Biological Scientists
SCI - Biological Technicians
SCI - Chemical Technicians
SCI - Chemists and Materials Scientists
SCI - Economists
SCI - Environmental Scientists and Geoscientists
SCI - Geological and Petroleum Technicians, and Nuclear Technicians

In Health Care Industry
SCI - Medical Scientists, and Life Scientists, all other
SCI - Miscellaneous Life, Physical, and Social Science Technicians, Including Social Science Research Assistants
SCI - Miscellaneous Social Scientists, Including Survey Researchers and Sociologists
SCI - Physical Scientists, all other
SCI - Psychologists
TRN - Aircraft Pilots and Flight Engineers
TRN - Ambulance Drivers and Attendants, Except Emergency Medical Technicians

Source: U.S. Census Bureau (2010b)

Table 4 Numbers of D/HH Persons as a Proportion of the U.S. Population by Age Group

Age Group	U.S. Population	Number D/HH	% D/HH
0-5	24,205,204	126,318	0.5%
6-18	54,638,735	336,926	0.6%
19-25	30,489,768	240,201	0.8%
26-44	77,898,920	883,232	1.1%
45-64	81,667,688	2,922,278	3.6%
65 +	40,449,374	6,316,740	15.6%
Total	309,349,689	10,825,695	3.5%

Source: U.S. Census Bureau (2010b)

Table 5 Ethnicity of the D/HH Population and the Hearing Population of the U.S.

Ethnicity	D/HH	Hearing
White alone (including those Latinos who consider themselves White)	84.6%	73.8%
Black or African American alone	7.9%	12.8%
American Indian alone	0.8%	0.6%
Alaska Native alone	0.1%	0.04%
American Indian and Alaska Native and no other races	0.2%	0.2%
Asian alone	2.4%	4.8%
Native Hawaiian and Other Pacific Islander alone	0.1%	0.2%
Some other race alone	2.2%	4.9%
Two or more major race groups	1.8%	2.7%

Source: U.S. Census Bureau (2010b)

Table 6 Comparison of Highest Level of School Attainment of D/HH Individuals in 1972 and 2010

Education Level	1972*	2010**
No High School Diploma	53.3%	20.1%
High School Diploma	34.7%	33.1%
Some College	5.6%	23.5%
College Graduate	6.4%	23.3%

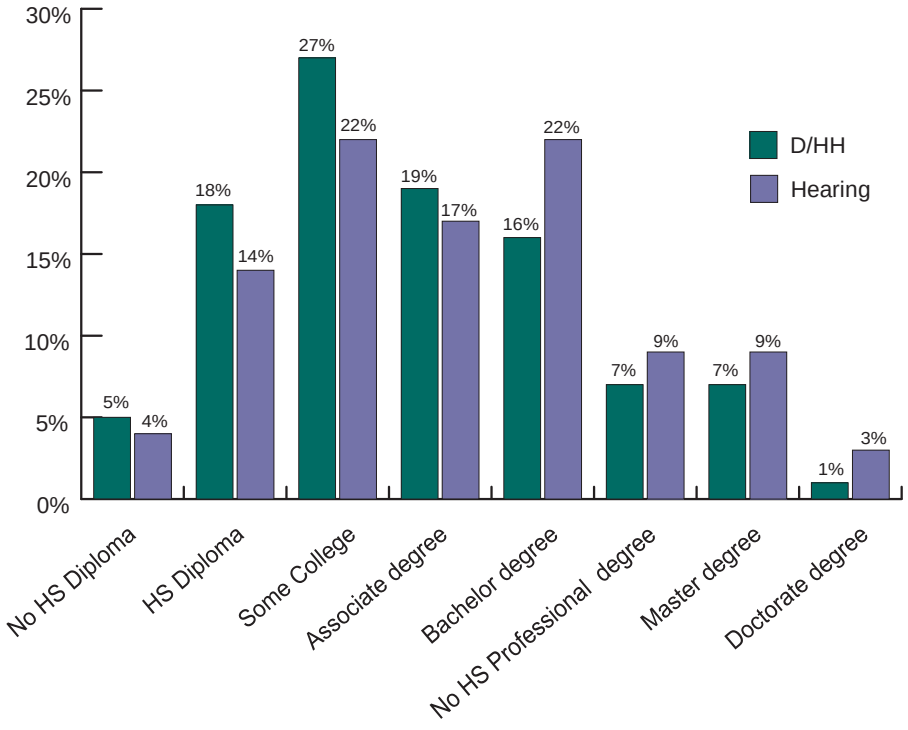
**From Schein and Delk (1974)*
***Calculated from U.S. Census Bureau (2010b)*

Table 7 Percent of Students Who are D/HH Scoring in Each Quartile on the Wood- cock-Johnson III Tests

Percentile	Applied Problems	Calculation	Comprehension	Science	Social Studies	Synonym-Antonym
0-25	54%	40%	76%	71%	69%	57%
26-50	33%	18%	12%	14%	17%	24%
51-75	13%	29%	5%	10%	7%	12%
>75	1%	13%	7%	5%	7%	7%
Mean	25%ile	38%ile	18%ile	20%ile	22%ile	26%ile

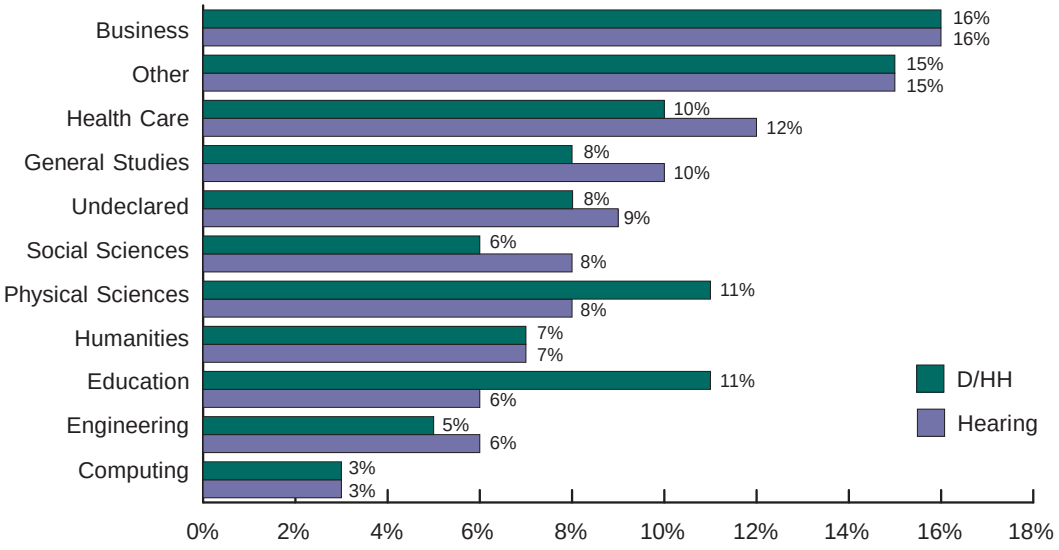
Source: *NLTS2 Direct Assessment Academic Knowledge Tables (Wagner, Newman, Cameto, & Levine, 2006).*
Applied Problems Table 4 (http://www.nlts2.org/data_tables/tables/5/ndaAP_PRfrm.html)
Calculation Table 3 (http://www.nlts2.org/data_tables/tables/5/ndacalc_prfrm.html)
Comprehension Table 2 (http://www.nlts2.org/data_tables/tables/5/ndaPC_PRfrm.html)
Science Table 6 (http://www.nlts2.org/data_tables/tables/5/ndaSci_prfrm.html)
Social Studies Table 5 (http://www.nlts2.org/data_tables/tables/5/ndaSS_prfrm.html)
Synonym-Antonym Table 1 (http://www.nlts2.org/data_tables/tables/5/ndaSyn_prfrm.html

Figure 1 Educational Attainments for Individuals Employed in Health Care Professions



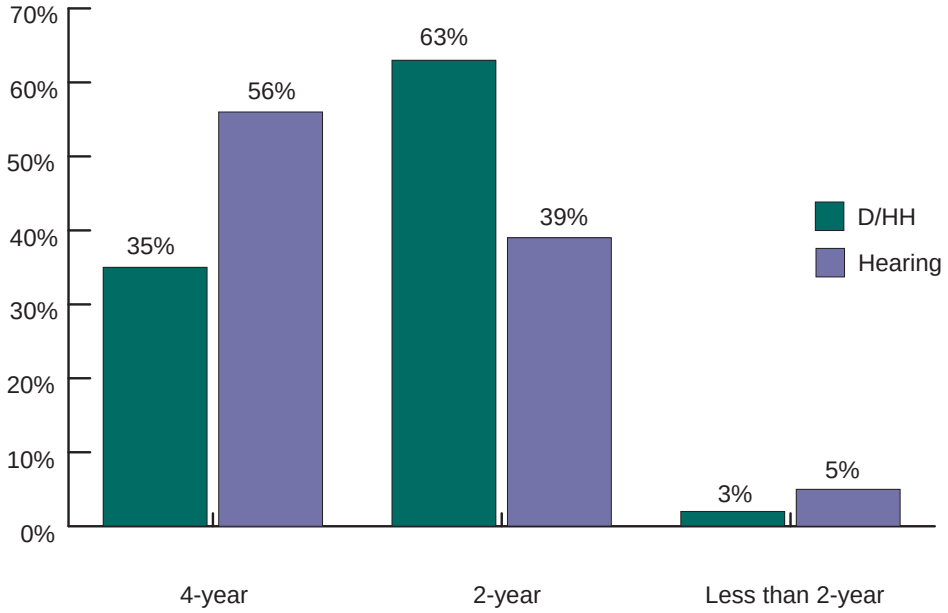
Source: U.S. Census Bureau (2010b)

Figure 2 College Majors for Undergraduates Ages 18-25 by Hearing Level



Source: U.S. Department of Education, National Center for Education Statistics (2008)

Figure 3 Institution Level of Undergraduate Students in Health Care Majors by Hearing Level



Source: U.S. Department of Education, National Center for Education Statistics (2008)

Appendices

Appendix I: Terms and Abbreviations

Access Services: Services that allow for access to the environment. In this report, the term "access services" refers to communication and information access services, including assistive technology, notetaking, or forms of interpreting.

ADA: Americans with Disabilities Act

AMA: American Medical Association

AMPHL: Association of Medical Professionals with Hearing Losses

Amplified Stethoscope: A medical device designed to compensate for hearing differences that allows physicians, nurses, and other medical professionals to detect and analyze heart, lung, and/or bowel sounds for purposes of differential diagnosis.

ASL: American Sign Language, a visual/gestural language that has its own grammar and syntax. It is distinct from English and is not simply a manual version of English.

ASL-STEM Forum: The American Sign Language-Science, Technology, Engineering, and Mathematics Forum is an open-source online collaborative effort that works similar to Wikipedia, where participants can add video content or rate signs for science terms (http://aslstem.cs.washington.edu/; Bigham *et al.*, 2008; Cavender *et al.,* 2010). It is based on a research project led by the University of Washington to standardize ASL vocabulary for terms used in STEM fields.

Assistive Technology: Technology used by individuals with disabilities to perform functions that might otherwise be difficult or impossible. Examples include, but are not limited to, visual, auditory, and/or tactile notifier devices such as light signalers and bed shakers, as well as hardware, software, and peripherals that facilitate access as needed.

ATE: Advanced Technological Education National Centers of Excellence

CapTel: A telephone device with captioning capability that displays spoken words articulated by individuals in a conversation.

CART: Communication Access Realtime Translation

CCOE: Consortium Center of Excellence in Health Care Careers for Deaf and Hard-of-Hearing Students

Closed Captioning: The process of displaying text on a television, video screen, or other visual display to provide additional or interpretive information to individuals who wish to access it. Closed captions typically show a transcription of the audio portion of a program as it occurs live or in edited form, sometimes including non-speech elements.

COE: Center of Excellence

Communication Barriers: Obstacles that restrict the ability of individuals to communicate with each other. In particular, communication barriers refer to obstacles D/HH people have in articulating, understanding, or accessing spoken language and obstacles hearing people have in articulating, understanding, or accessing sign language.

Cued Speech: A manual communication system whereby visual information from speechreading is represented by different hand shapes on the face.

Cultural Competence: Effective functioning within the context of cultural parameters.

Culturally Deaf: Refers to individuals who rely primarily on American Sign Language for communication and share norms, values, art, experiences, and other characteristics parallel to that of other cultural/ethnic groups.

Designated Interpreter: Specialized interpreters who have received training in medical content and vocabulary, and are attuned to the social role of the medical professional for whom they are interpreting, as well as their own role in specific settings such as the classroom and meetings between medical colleagues.

D/HH: Deaf/Hard of Hearing

DWC: Deaf Wellness Center at the University of Rochester

Electronic Stethoscope: A broad term that refers to high tech clinical medical instruments, such as visual and/or amplified stethoscopes.

Explore Your Future: A summer career awareness program at the National Technical Institute for the Deaf (at Rochester Institute of Technology) where sophomore and junior D/HH high school students experience college life, engage in hands-on activities, and acquire a taste of real-world careers in the fields of business, computing, engineering, science, and art.

FCC: Federal Communications Commission

FRS: Federal Relay Service

GPA: Grade Point Average

Hard of Hearing: Reflects a permanent or fluctuating hearing level which is sufficient to allow the individual to use audition for some amount of receptive communication with or without the use of auditory aids.

HBCU: Historically Black Colleges and Universities

Health Care Interpreting: A broad term that refers to interpreting in health care settings, including settings providing medical, dental, and mental health services.

Hearing Impaired: A broad term that refers to anyone with hearing differences. While some individuals may say they are hearing impaired, this is not a term favored by many D/HH individuals.

HIPAA: Health Insurance Portability and Accountability Act

HLAA: Hearing Loss Association of America

JAN: Job Accommodation Network

Late Deafened: Individuals who lose their hearing after acquiring language.

Laurent Clerc National Deaf Education Center: A K-12 pre-college educational program at Gallaudet University for D/HH students that also provides information related to D/HH children from birth through age 21 in the United States.

Linguistic Barriers: The restricted ability to read, speak, write, or understand languages. Within the context of this report, linguistic barriers refer to limited access to spoken English.

MCC: Monroe Community College

Medical Interpreter: An interpreter with specialized training in medical interpreting who provides interpreting services in medical settings. At present, there is no certification for medical interpreting.

MMEP: Minority Medical Education Program

NAGHCC: National Advisory Group on Health Care Careers for Deaf and Hard-of-Hearing Individuals

NAD: National Association of the Deaf. The nation's premier civil rights organization of, by and for deaf and hard-of-hearing individuals in the United States.

NCAS: National Center on Access Services Innovation and Consultation for Deaf and Hard-of-Hearing Health Care Students and Professionals

NCDHR: National Center on Deaf Health Research at the University of Rochester Medical Center

NIC: National Interpreter Certification

NIDCD: National Institute on Deafness and Other Communication Disorders

NLTS: National Longitudinal Transition Study

Noise Filtering: A system that removes background noise from sound. For example, phone amplifiers clarify sounds a deaf or hard-of-hearing user hears by filtering background noise and boosting the sound volume (www.howstuffworks.com). Other examples are acoustical curtains and other sound absorbing surfaces such as drapes or walls that filter out background noises and enhance sound quality.

NPSAS: National Postsecondary Student Aid Study

NSF: National Science Foundation

ODEP: Office of Disability Employment Policy (part of the U.S. Department of Labor)

Oral Deaf: A group of people who are born deaf or become deaf early in life and rely primarily on spoken language.

OVR: Office of Vocational Rehabilitation

Personal Digital Assistant (PDA): A mobile device that has the ability to connect to the Internet, such as a mobile phone.

PHC: Premedical Honors College of Baylor College

PHSA: Public Health Service Act

RGHS: Rochester General Health System

RID: Registry of Interpreters for the Deaf

RIT/NTID: Rochester Institute of Technology/National Technical Institute for the Deaf

Sam-Go Products: Manufacturer of a see-through surgical mask that provides access to speechreading.

Science and Technology Entry Program (STEP): A program for economically disadvantaged high school students who come from underrepresented backgrounds, funded by New York State.

SMDEP: Summer Medical and Dental Education Program

Specialized Interpreting: Content areas within the interpreting field that require specialized in-depth training to work effectively.

STEM: Science, Technology, Engineering and Mathematics

Student Response System: A technological approach, also labeled as an audience response system, to assess students in an interactive learning environment by providing quantitative tools through a computer to influence the processing of questions and formulation of answers by the student in a non-threatening and positive manner.

Summer Research Fellowship Program (SURF): A program at the University of Rochester that exposes participants to medically related research and career options in academic medicine where students work with faculty researchers from varied disciplines such as pharmacology, neurobiology, and cardiology. The long-range goal of the program is to enhance participants' competitiveness for admission to graduate or health professions schools.

Technical Standards: Standard criteria used by medical schools to ensure that candidates can accomplish required curricular tasks, including caring for patients in a safe and effective manner.

Telecommunications Relay Service (TRS): An operator service that allows people who are deaf, hard of hearing, speech-disabled, or deaf-blind to place and receive calls via assistive devices such as videophones, smartphones, Webcams, and tablets.

Telemedicine Technology: The use of medical information exchanged from one site to another via electronic communications to improve patients' health status.

TTYs: Text telephone

UCSD: University of California, San Diego

UKHPHL: United Kingdom Health Professionals with Hearing Losses

Universal Design: A broad spectrum of ideas meant to produce buildings, products, and environments that are inherently visual, auditory and tactile accessible to both people with and without disabilities. Smartphone is an example of technology that incorporates visual, tactile, and auditory signals.

UR: University of Rochester

URM: Underrepresented minority students

URMC: University of Rochester Medical Center

UTPA: University of Texas-Pan American

Video Relay Services (VRS): A video telecommunication service that allows deaf, hard-of- hearing, and speech-impaired individuals to communicate via video telephones and similar technologies in real-time, via a sign language interpreter.

Video Remote Interpreting (VRI): The use of video devices or Web cameras to provide sign language or spoken language interpreting services through a remote or off-site interpreter, in order to communicate face-to-face with persons with whom there is a communication bar- rier.

Videophone: A telephone with a video screen that is capable of full bi-directional video and audio transmissions for communication between people in real-time.

Visual Stethoscope: A high-tech clinical medical instrument that allows visual display of ECG (electrocardiogram) waveform, heart rate, pulse oxygen meter, and digital watch functions.

Woodcock-Johnson III Tests: A co-normed set of tests for measuring general intellectual ability, specific cognitive abilities, oral language, and academic achievement.

Young Scholars Program: A summer program at Gallaudet University with three areas of study in environmental science, visual arts, and performing arts for talented and gifted deaf, hard-of-hearing, and hearing teenagers between the ages of 14 and 17.

Youth Apprenticeship Program: A program at Rochester General Health System designed to give city school students the chance to succeed and achieve a career in health care. A Certificate of Completion is awarded to the student who completes youth employment competency training.

Appendix II: Occupational Outlook for the Health Care Industry[14]

Many job openings should arise in all health care employment settings as a result of industry expansion and the need to replace workers who retire or leave their jobs for other reasons (see Table A1 on the following page). The health care industry will generate 3.2 million new jobs between 2008 and 2018, more than any other industry, largely in response to rapid growth in the elderly population. In addition, 10 of the 20 fastest growing occupations are related to health care. Overall, the industry is projected to increase 22% through 2018 compared with 11% for all other industries. This growth is due to many factors.

1. The proportion of the population in older age groups will grow faster than the total population between 2008 and 2018. As a result, demand for health care will increase, especially in employment settings specializing in care for the elderly.
2. Advances in medical technology will continue to improve the survival rate of severely ill and injured patients, who then will need extensive therapy and care.
3. New technologies will continue to enable earlier diagnoses of many diseases, which often increase the ability to treat conditions that previously were not treatable.
4. Industry growth also will occur as a result of the shift from inpatient to less expensive outpatient and home health care because of improvements in diagnostic tests and surgical procedures, along with patients' desires to be treated at home.

From Table A1 (on the following page), it can be observed that offices of health practitioners, nursing and residential care facilities, hospitals, home health care services, and outpatient, laboratory, and ambulatory care services are projected to experience the largest growth among the industries comprising the health care area. Among these fastest growing areas, offices of health practitioners, and outpatient, laboratory, and ambulatory care services will experience the fastest growth.

[14] Extracted and edited from U.S. Bureau of Labor Statistics (2010)

Table A1 Employment Projections by Industry: 2008 to 2018

[7,214.9 represents 7,214,900. Estimates based on the Current Employment Statistics program. See source for methodological assumptions. Minus sign (-) indicates decline]

Industry	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
LARGEST GROWTH				
Construction	7,214.9	8,552.0	1,337.1	1.7
Offices of health practitioners	3,713.3	4,978.6	1,265.3	3.0
Management, scientific, and technical consulting services	1,008.9	1,844.1	835.2	6.2
Food services and drinking places	9,631.9	10,370.7	738.8	0.7
Computer systems design and related services	1,450.3	2,106.7	656.4	3.8
Retail trade	15,356.4	16,010.4	654.0	0.4
General local government educational services compensation	8,075.6	8,728.3	652.7	0.8
Nursing and residential care facilities	3,008.0	3,644.8	636.8	1.9
Employment services	3,144.4	3,744.1	599.7	1.8
Hospitals	4,641.2	5,191.9	550.7	1.1
Individual and family services	1,108.6	1,638.8	530.2	4.0
Home health care services	958.0	1,399.4	441.4	3.9
Services to buildings and dwellings	1,847.1	2,182.6	335.5	1.7
Architectural, engineering, and related services	1,444.7	1,769.5	324.8	2.0
Other educational services	578.9	894.9	316.0	4.5
Outpatient, laboratory, and other ambulatory care services	989.5	1,297.9	308.4	2.8
Wholesale trade	5,963.9	6,219.8	255.9	0.4
Junior colleges, colleges, universities, and professional schools	1,602.7	1,857.4	254.7	1.5
Legal services	1,163.7	1,416.8	253.1	2.0
General government, other compensation	4,224.1	4,464.0	239.9	0.6
LARGEST DECLINES				
Semiconductor and other electronic component manufacturing	432.4	286.8	-145.6	-4.0
Newspaper, periodical, book, and directory publishers	618.9	499.2	-119.7	-2.1
Motor vehicle parts manufacturing	544.4	443.3	-101.1	-2.0
Postal service	747.5	650.0	-97.5	-1.4

Industry	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
Printing and related support activities	594.1	499.3	-94.8	-1.7
Telecommunications	1,021.5	931.9	-89.6	-0.9
Cut and sew apparel manufacturing	155.2	66.7	-88.5	-8.1
Support activities for mining	327.7	251.7	-76.0	-2.6
Crop production	950.6	880.7	-69.9	-0.8
Converted paper product manufacturing	319.7	255.6	-64.1	-2.2
Insurance carriers	1,401.8	1,338.2	-63.6	-0.5
Electric power generation, transmission, and distribution	404.7	345.7	-59.0	-1.6
Computer and peripheral equipment manufacturing	182.8	124.7	-58.1	-3.8
Basic chemical manufacturing	152.1	99.9	-52.2	-4.1
Pulp, paper, and paperboard mills	126.1	81.9	-44.2	-4.2
Machine shops, turned product; and screw, nut, and bolt manufacturing	360.1	319.5	-40.6	-1.2
Animal production	860.6	823.9	-36.7	-0.4
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	149.5	112.8	-36.7	-2.8
Plastics product manufacturing	589.0	555.2	-33.8	-0.6
Textile furnishings mills	75.4	41.9	-33.5	-5.7
FASTEST GROWTH				
Management, scientific, and technical consulting services	1,008.9	1,844.1	835.2	6.2
Other educational services	578.9	894.9	316.0	4.5
Individual and family services	1,108.6	1,638.8	530.2	4.0
Home health care services	958.0	1,399.4	441.4	3.9
Specialized design services	143.1	208.7	65.6	3.8
Data processing, hosting, related services, and other information services	395.2	574.1	178.9	3.8
Computer systems design and related services	1,450.3	2,106.7	656.4	3.8
Lessors of nonfinancial intangible assets (except copyright works)	28.2	37.9	9.7	3.0
Offices of health practitioners	3,713.3	4,978.6	1,265.3	3.0
Personal care services	621.6	819.1	197.5	2.8

Industry	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
Outpatient, laboratory, and other ambulatory care services	989.5	1,297.9	308.4	2.8
Facilities support services	132.7	173.6	40.9	2.7
Software publishers	263.7	342.8	79.1	2.7
Independent artists, writers, and performers	50.4	64.8	14.4	2.5
Local government passenger transit	268.6	342.6	74.0	2.5
Elementary and secondary schools	854.9	1,089.7	234.8	2.5
Scientific research and development services	621.7	778.9	157.2	2.3
Waste management and remediation services	360.2	451.0	90.8	2.3
Other miscellaneous manufacturing	321.0	399.4	78.4	2.2
Community and vocational rehabilitation services	540.9	672.0	131.1	2.2
MOST RAPIDLY DECLINING				
Cut and sew apparel manufacturing	155.2	66.7	-88.5	-8.1
Apparel knitting mills	26.2	12.5	-13.7	-7.1
Textile and fabric finishing and fabric coating mills	48.3	23.5	-24.8	-7.0
Fabric mills	65.4	35.0	-30.4	-6.1
Audio and video equipment manufacturing	27.0	14.6	-12.4	-6.0
Apparel accessories and other apparel manufacturing	17.0	9.2	-7.8	-6.0
Fiber, yarn, and thread mills	37.4	20.7	-16.7	-5.7
Textile furnishings mills	75.4	41.9	-33.5	-5.7
Railroad rolling stock manufacturing	28.4	17.5	-10.9	-4.7
Footwear manufacturing	15.8	10.0	-5.8	-4.5
Pulp, paper, and paperboard mills	126.1	81.9	-44.2	-4.2
Basic chemical manufacturing	152.1	99.9	-52.2	-4.1
Semiconductor and other electronic component manufacturing	432.4	286.8	-145.6	-4.0
Computer and peripheral equipment manufacturing	182.8	124.7	-58.1	-3.8
Other textile product mills	72.2	49.4	-22.8	3.0

Industry	Employment 2008	Employment 2018	Change 2008-2018	Average annual rate of change 2008-2018
Federal enterprises except the Postal Service and electric utilities	63.5	44.9	-18.6	-3.4
Leather and hide tanning and finishing, and other leather and allied product manufacturing	17.8	13.0	-4.8	-3.1
Cutlery and hand tool manufacturing	49.1	35.9	-13.2	-3.1
Manufacturing and reproducing magnetic and optical media	34.9	26.0	-8.9	-2.9
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	149.5	112.8	-36.7	-2.8

Source: Woods (2009)

As seen in Table A2 on the following page, many of the occupations projected to grow the fastest in the economy also are concentrated in the health care industry. For example, over the period 2008-18, total employment of home health aides is projected to increase by 50%, medical assistants by 34%, physical therapist assistants by 33%, and physician assistants by 39%. These high growth occupations run the gamut from home health aides and physical therapist aides to biomedical engineers and medical scientists. The table also shows that preparation for most of these careers will require advanced training beyond a high school degree. This postsecondary training and education will require that access be given to individuals who are D/HH, and that appropriate accommodations be made to permit these individuals to successfully complete the training.

Rapid growth also is expected for workers in occupations concentrated outside the inpatient hospital sector, such as pharmacy technicians and personal and home care aides. Because of cost pressures, many health care facilities will adjust their staffing patterns to reduce labor costs. Where patient care demands and regulations allow, health care facilities will substitute lower paid providers and will cross-train their workforces. Many facilities have cut the number of middle managers, while simultaneously creating new managerial positions as the facilities diversify. Traditional inpatient hospital positions no longer are the only option for many future health care workers; persons seeking a career in the field must be willing to work in various employment settings. As shown in Table A1 on p. 89, hospitals will be the slowest growing segment within the health care industry because of efforts to control hospital costs and the increasing use of outpatient clinics and other alternative care sites.

Demand for dental care will rise due to greater retention of natural teeth by middle-aged and older persons, greater awareness of the importance of dental care, and an increased ability to pay for services. Dentists will use support personnel, such as dental hygienists and assistants, to help meet their increased workloads.

Occupations with the most replacement openings usually are large, with high turnover stemming from low pay and status, poor benefits, low training requirements, and a high propor-

tion of young and part-time workers. Nursing aides, orderlies and attendants, and home health aides are among the occupations adding the most new jobs in this industry between 2008 and 2018, overall about 592,200. In contrast, occupations with relatively few replacement openings, such as physicians and surgeons, are characterized by high pay and status, lengthy training requirements, and a high proportion of full-time workers.

Another occupation that is expected to have many openings is registered nurses. The median age of registered nurses is increasing, and not enough younger workers are replacing them. As a result, employers in some parts of the country are reporting difficulties in attracting and retaining nurses. Health care workers at all levels of education and training will continue to be in demand. In many cases, it may be easier for jobseekers with health-specific training to obtain jobs and advance in their careers. Specialized clinical training is a requirement for many jobs in health care and is an asset even for many administrative jobs that do not specifically require it.

Table A2 Employment Projections by Occupation: 2008 to 2018

[*In thousands (16.0 represents 16,000), except percent and rank. Estimates based on the Current Employment Statistics Program; the Occupational Employment Statistics Survey; and the Current Population Survey. See source for methodological assumptions. Occupations based on the 2000 Standard Occupational Classification system*]

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
FASTEST GROWING					
Biomedical engineers	16.0	27.6	11.6	72.0	Bachelor's degree
Network systems and data communications analyst	292.0	447.8	155.8	53.4	Bachelor's degree
Home health aides	921.7	1,382.6	460.9	50.0	Short-term on-the-job training
Personal and home care aides	817.2	1,193.0	375.8	46.0	Short-term on-the-job training
Financial examiners	27.0	38.1	11.1	41.2	Bachelor's degree
Medical scientists, except epidemiologists	109.4	153.6	44.2	40.4	Doctoral degree
Physician assistants	74.8	103.9	29.2	39.0	Master's degree
Skin care specialists	38.8	53.5	14.7	37.9	Postsecondary vocational award

[15] An occupation is placed into 1 of 11 categories that best describes the postsecondary education or training needed by most workers to become fully qualified in that occupation. For more information about the categories, see Measure of Education and Training on the Internet at http://www.bls.gov/emp/ep_education_tech.htm.

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
Biochemists and biophysicists	23.2	31.9	8.7	37.4	Doctoral degree
Athletic trainers	16.3	22.4	6.0	37.0	Bachelor's degree
Physical therapist aides	46.1	62.8	16.7	36.3	Short-term on-the-job training
Dental hygienists	174.1	237.0	62.9	36.1	Associate degree
Veterinary technologists and technicians	79.6	108.1	28.5	35.8	Associate degree
Dental assistants	295.3	400.9	105.6	35.8	Moderate-term on-the-job training
Computer software engineers, applications	514.8	689.9	175.1	34.0	Bachelor's degree
Medical assistants	483.6	647.5	163.9	33.9	Moderate-term on-the-job training
Physical therapist assistants	63.8	85.0	21.2	33.3	Associate degree
Veterinarians	59.7	79.4	19.7	33.0	First professional degree
Self-enrichment education teachers	253.6	334.9	81.3	32.0	Work experience in a related occupation
Compliance officers, except agriculture, construction, health and safety, and transportation	260.2	341.0	80.8	31.1	Long-term on-the-job training
Occupational therapist aides	7.8	10.2	2.4	30.7	Short-term on-the-job training
Environmental engineers	54.3	70.9	16.6	30.6	Bachelor's degree
Pharmacy technicians	326.3	426.0	99.8	30.6	Moderate-term on-the-job training
Computer software engineers, systems software	394.8	515.0	120.2	30.4	Bachelor's degree
Survey researchers	23.4	30.5	7.1	30.4	Bachelor's degree
Physical therapists	185.5	241.7	56.2	30.3	Master's degree
Personal financial advisors	208.4	271.2	62.8	30.1	Bachelor's degree
Environmental engineering technicians	21.2	27.5	6.4	30.1	Associate degree

[15] An occupation is placed into 1 of 11 categories that best describes the postsecondary education or training needed by most workers to become fully qualified in that occupation. For more information about the categories, see Measure of Education and Training on the Internet at http://www.bls.gov/emp/ep_education_tech.htm.

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
Occupational therapist assistants	26.6	34.6	7.9	29.8	Associate degree
Fitness trainers and aerobics instructors	261.1	337.9	76.8	29.4	Postsecondary vocational award
LARGEST JOB GROWTH					
Registered nurses	2,618.7	3,200.2	581.5	22.2	Associate degree
Home health aides	921.7	1,382.6	460.9	50.0	Short-term on-the-job training
Customer service representatives	2,252.4	2,651.9	399.5	17.7	Moderate-term on-the-job training
Combined food preparation and serving workers, including fast food	2,701.7	3,096.0	394.3	14.6	Short-term on-the-job training
Personal and home care aides	817.2	1,193.0	375.8	46.0	Short-term on-the-job training
Retail salespersons	4,489.2	4,863.9	374.7	8.4	Short-term on-the-job training
Office clerks, general	3,024.4	3,383.1	358.7	11.9	Short-term on-the-job training
Accountants and auditors	1,290.6	1,570.0	279.4	21.7	Bachelor's degree
Nursing aides, orderlies, and attendants	1,469.8	1,745.8	276.0	18.8	Postsecondary vocational award
Postsecondary teachers	1,699.2	1,956.1	256.9	15.1	Doctoral degree
Construction laborers	1,248.7	1,504.6	255.9	20.5	Moderate-term on-the-job training
Elementary school teachers, except special education	1,549.5	1,793.7	244.2	15.8	Bachelor's degree
Truck drivers, heavy and tractor-trailer	1,798.4	2,031.3	232.9	13.0	Short-term on-the-job training
Landscaping and grounds keeping workers	1,205.8	1,422.9	217.1	18.0	Short-term on-the-job training
Bookkeeping, accounting, and auditing clerks	2,063.8	2,276.2	212.4	10.3	Moderate-term on-the-job training
Executive secretaries and administrative assistants	1,594.4	1,798.8	204.4	12.8	Work experience in a related occupation
Management analysts	746.9	925.2	178.3	23.9	Bachelor's or higher degree, plus work experience

[15] An occupation is placed into 1 of 11 categories that best describes the postsecondary education or training needed by most workers to become fully qualified in that occupation. For more information about the categories, see Measure of Education and Training on the Internet at http://www.bls.gov/emp/ep_education_tech.htm.

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
Computer software engineers, applications	514.8	689.9	175.1	34.0	Bachelor's degree
Receptionists and information clerks	1,139.2	1,312.1	172.9	15.2	Short-term on-the-job training
Carpenters	1,284.9	1,450.3	165.4	12.9	Long-term on-the-job training
Medical assistants	483.6	647.5	163.9	33.9	Moderate-term on-the-job training
First-line supervisors/managers of office and administrative support workers	1,457.2	1,617.5	160.3	11.0	Work experience in a related occupation
Network systems and data communications analysts	292.0	447.8	155.8	53.4	Bachelor's degree
Licensed practical and licensed vocational nurses	753.6	909.2	155.6	20.7	Postsecondary vocational award
LARGEST JOB DECLINE					
Farmers and ranchers	985.9	906.7	–79.2	–8.0	Long-term on-the-job training
Sewing machine operators	212.4	140.9	–71.5	–33.7	Moderate-term on- the-job training
Order clerks	245.7	181.5	–64.2	–26.1	Short-term on-the-job training
Postal service mail sorters, processors, and processing machine operators	179.9	125.3	–54.5	–30.3	Short-term on-the-job training
File clerks	212.2	162.6	–49.6	–23.4	Short-term on-the-job training
Shipping, receiving, and traffic clerks	750.5	701.2	–49.3	–6.6	Short-term on-the-job training
Telemarketers	341.6	303.8	–37.8	–11.1	Short-term on-the-job training
Office and administrative support workers, all other	306.7	271.0	–35.7	–11.6	Short-term on-the-job training
First-line supervisors/managers of production and operating workers	681.2	645.5	–35.7	–5.2	Work experience in a related occupation
Packers and packagers, hand	758.8	724.8	–34.0	–4.5	Short-term on-the-job training
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	236.8	203.5	–33.3	–14.1	Moderate-term on-the-job training
Electrical and electronic equipment assemblers	213.3	182.0	–31.3	–14.7	Short-term on-the-job training

[15] An occupation is placed into 1 of 11 categories that best describes the postsecondary education or training needed by most workers to become fully qualified in that occupation. For more information about the categories, see Measure of Education and Training on the Internet at http://www.bls.gov/emp/ep_education_tech.htm.

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
Machine feeders and off bearers	140.6	109.5	–31.2	–22.2	Short-term on-the-job training
Door-to-door sales workers, news and street vendors, and related workers	181.6	154.7	–26.9	–14.8	Short-term on-the-job training
Information and record clerks, all other	226.9	200.1	–26.7	–11.8	Short-term on-the-job training
Paper goods machine setters, operators, and tenders	103.3	81.0	–22.2	–21.5	Moderate-term on-the-job training
Computer operators	110.0	89.5	–20.5	–18.6	Moderate-term on-the-job training

Occupation	Employment		Change 2008-2018		Most significant source of postsecondary education or train-
	2008	2018	Number	Percent	
Machinists	421.5	402.2	–19.3	–4.6	Long-term on-the-job training
Laborers and freight, stock, and material movers, hand	2,317.3	2,298.6	–18.7	–0.8	Short-term on-the-job training
Miscellaneous agricultural workers	807.0	788.8	–18.2	–2.3	Short-term on-the-job training
Data entry keyers	284.3	266.9	–17.4	–6.1	Moderate-term on-the-job training
Switchboard operators, including answering service	155.2	138.3	–16.9	–10.9	Short-term on-the-job training
Inspectors, testers, sorters, samplers, and weightier	464.7	447.8	–16.9	–3.6	Moderate-term on-the-job training

Health Care Job Earnings

Average earnings of non-supervisory workers in most health care segments are higher than the average for all private industry, with hospital workers earning considerably more than the average and those employed in nursing and residential care facilities and home health care services earning less. Average earnings often are higher in hospitals because the percentage of jobs requiring higher levels of education and training is greater than in other segments.

As in most industries, professionals and managers working in health care typically earn more than other workers in the industry. Wages in individual health care occupations vary as widely as the duties, level of education and training, and amount of responsibility required by the occupation. Earnings vary not only by type of establishment and occupation, but also by size; salaries tend to be higher in larger hospitals and group practices. Geographic location also can affect earnings.

Appendix III: Pipelines to Health Care Training Careers: A Literature Review

Literature from the last decade of the 20th century (Barnett, 2002; Harmer, 1999; Sadler, 2001; Scheier, 2009; Sinai Health System & Advocate Health Care, 2004; Steinberg, Barnett, Meador, Wiggins, & Zazove, 2006) describes significant language and cultural barriers faced by patients who are D/HH when seeking health care advice and when interacting with health providers. Often, sign language interpreters are not trained to understand and interpret in the medical area. Even highly trained medical interpreters may not be able to bridge the communication gap when working in the medical area. As a result, many of the studies cited above recommend special training so that health care professionals can have direct communication with their D/HH clients. Steinberg, et al., (2006) conclude that D/HH people who use ASL experience barriers similar to other linguistic minority groups: infrequent contact with health care providers who know their language and culture and the frequent necessity of using interpreters. Where deaf and signing health care professionals are available, deaf patients prefer direct communication over interpreted encounters with non-deaf medical providers.

Speaking in an advocacy role, the National Association of the Deaf has stressed the need for direct communication in the delivery of mental health services.

> The purpose of this position statement is to acknowledge and emphasize the importance and need for direct communication, sensitivity to cultural affiliation, and sensitivity to the psychosocial impact of hearing loss in the delivery of mental health, mental retardation, and substance abuse services to people who are deaf, hard of hearing, late deafened, and deaf-blind in every state throughout the country (National Association of the Deaf, 2003).

This rationale is not unlike that made for seeking to get more underrepresented minorities into the health care professions:

… increasing the number of minority health practitioners in these underserved communities must play a major role in reducing health disparities and addressing issues of health care access for at-risk populations (Smith, Nsiah-Kumi, Jones, & Pamies, 2009, p. 836).

The Deaf Wellness Center (DWC) at the University of Rochester Medical Center (http://www.urmc.rochester.edu/deaf-wellness-center/) is one of the country's leading training and research and development sites that focuses on mental health, sign language interpreting, and public health issues affecting people who are D/HH. Germane to this report is the fact that this center also provides training to students in the University's medical school concerning the needs of persons who are D/HH. The DWC faculty also teaches medical students, psychiatry residents, sign language interpreters, and many other types of professionals and staff. Faculty members travel throughout the U.S. and Europe, teaching and sharing research findings.

While there is considerable literature available describing and evaluating "pipeline" programs to encourage minority and disadvantaged youth to enter the health care professions (U.S. Department of Health and Human Services, 2006; Smith, Nsiah-Kumi, Jones, & Pamies, 2009; U.S. Department of Health and Human Services, 2009), virtually no literature is available on such programs for individuals who are D/HH. The few training programs designed specifically for D/HH individuals reside in just three institutions: Gallaudet University, the National Technical Institute for the Deaf at Rochester Institute of Technology, and the Southwest Collegiate Institute for the Deaf at Howard College. Yet none of these can be considered health care training "pipeline" programs, which typically include career development with emphasis on mathematics and science instruction at the high school level, mentoring and internship programs at the postsecondary level, and special consideration for admission and support at the postgraduate level. The following is a review of some of the programs that serve as model pipelines to health care careers for minority students.

Preparation for Postsecondary Health Care Majors

A considerable number of model pipeline programs focus on early intervention (during secondary school) to attract youth from disadvantaged backgrounds to enter the health care field.

Ventures in Education (Bediako, McDermott, Bleich, & Colliver, 1996) was established by the Josiah H. Macy, Jr. Foundation to improve the academic achievement of minority and economically disadvantaged students, particularly in science and mathematics. One specific objective was to increase the number of students who enter schools of the health professions, in particular schools of medicine. This enrichment program incorporated a challenging academic curriculum, educational enrichment in general health science, and tutoring to increase success in professions. An evaluation of the program indicated that prior to the implementation of the Ventures project, no students at the five participating high schools took the Medical College Admission Tests (MCATs), applied, were accepted, or matriculated into medical school. After five years of this enrichment program, these numbers increased, resulting in 72 students matriculating into medical school.

Gon (2003) describes a health services career pathway for promoting education standards, health, and health care professions recruitment to address a health care worker shortage in Hawaii. Recruitment began at the secondary level using the Health Services Career Pathway model. Partnerships with postsecondary institutions and industry served to recruit students and reinforce their career choices in health care. Several medical institutions provide assistance through "support forgiveness" or "loan forgiveness" to pay for academic program costs in exchange for agreements to work in personnel shortage areas. Activities to provide secondary students interaction with health care professionals through mentorships, internships, and service learning are described as important components of the program.

In 2008, the New York Department of Health awarded Gateway, situated within The City College of The City University of New York (http://www.gateway.cuny.edu/ Gateway_Site/ home.html) a three-year grant to create a program that would address the underrepresentation of minority and low-income students in medical school. Partnering with long-time allies at New York University Medical School and the State University of New York (SUNY)

Downstate Medical Center, and with the new Hofstra/North Shore/ LIJ School of Medicine, the Gateway Medical Pipeline is a five-year program that creates a bridge between high school and college. Students enter in the summer following their sophomore year in high school and attend summer programs through their junior year in college. In its first year, Gateway has accepted more than 60 students from its network of schools, who attend seminars on science and health-related topics, design research projects in teams, work with medical mentors, and visit labs, clinics, and museums during the summer. Each student receives a $500 stipend as part of a summer pipeline apprenticeship. The program, initiated in 2008, is the latest in Gateway's long history of bridging the gap in medical and health-related education for disadvantaged students. The new Gateway Medical Pipeline is building on this tradition by recognizing that the critical need for support begins in high school and continues into college. By providing students, teachers, and parents with essential support services, Gateway has achieved a distinguished track record, including:

- 97% of the 3,000 graduates of the Gateway program attended college;
- 80% of Gateway students graduated college within five years (versus 30% graduation rate nationally);
- Of the 85% of its graduates that Gateway has tracked, 10% attend medical school, 30 times the national rate for a ninth-grade cohort.

The University of California, San Francisco, Fresno (UCSF Fresno) sponsors The Doctors Academy (http://www.fresno.ucsf.edu/latinocenter/dr-academy.html), a high school program designed to improve minority students' success in pursuing medicine and other health professions. The Academy includes summer school enrichment programs; rigorous accelerated classes with an emphasis on math, science, and writing; weekly tutorial support from current UCSF Fresno pre-med students; Saturday academies and workshops; special counseling and support services; parent empowerment workshops; medical or health practitioner mentors; clinical placement in medical, science or health settings; special consideration for scholarship at UCSF Fresno; and consideration for early admission to the UCSF School of Medicine and UCSF School of Pharmacy.

COPE Health Solutions (http://www.copehealthsolutions.org/clinical-internships) even describes a community-based approach through its Health Professions Pipeline program. COPE provides a pre-health internship designed to offer high school students between the ages of 16-18 with exposure to health careers under the guidance of a mentor in a clinical setting. A hands-on clinical internship allows aspiring health care professionals, age 18 and over, to experience direct patient contact. Interns rotate among different clinical and administrative departments in a health care setting while working alongside health care professionals as members of the patient care team. In addition, they offer nurses and allied health students scholarship assistance with training.

Postsecondary Programs

The Biology Undergraduate Scholars Program (BUSP) at the University of California, Davis (http://www.busp.ucdavis.edu/) is an intensive enrichment program for undergraduates who have a strong interest in life science fields. BUSP, sponsored by the College of Biologi- cal Sciences, enriches the undergraduate experience by providing exciting and challenging opportunities to learn about and participate in the biological sciences. BUSP students enroll in a specially designed, rigorous academic program during their first two years of college, are funded to work in a biology research laboratory during the sophomore year, and meet regularly with skilled advisers who offer academic guidance and personal support. An evaluation of the BUSP program (Barlow & Villarejo, 2004) found that participants were more likely than control students to successfully complete general Chemistry, Calculus, and Biology, and to earn higher grades in Calculus and Chemistry. BUSP students were significantly more likely to graduate with a degree in Biology.

In 1988, The Robert Wood Johnson Foundation established the Minority Medical Education Program (MMEP) (http://www.rwjf.org/pr/product.jsp?id=14475) to increase the number of highly qualified medical school applicants from minority groups that were underrepresented in medicine, primarily African-Americans, Hispanics, and Native Americans. In 2003, the program changed its name to the Summer Medical Education Program, reflecting the inclusion of students representing a wide range of economic, cultural, racial, and ethnic diversity.

The Summer Medical and Dental Education Program (SMDEP) (http://www.smdep.org/) builds on the lessons learned from earlier programs (Cantor, Bergeisen, & Baker, 1998). It expanded to include pre-dental students who face challenges similar to those of pre-medical students, and it focuses on students in the first two years of college because the experience of previous programs indicated that this is when students derive the most benefit. Twelve sites nationwide provide scholars with academic enrichment in the basic sciences and math, clinical experiences, career development activities, learning and study skills seminars, and a financial planning workshop.

The Health Connection Opportunity Program (HCOP) at San Diego State University (http://www.sci.sdsu.edu/hcop/archives/old2/index.htm) is a collaborative program awarded to the University of California, San Diego School of Medicine that now offers academic workshops and advising support to underrepresented students interested in health careers. HCOP services include academic advising, career and professional school exploration opportunities, MCAT and other standardized test preparation, academic workshops, internship/research opportunities, and financial aid advising.

An evaluation of HCOP (Lewis, 1996) showed that participants had higher pass rates for the math and writing entry-level competency tests compared to other SDSU students. Mentoring journals (that mentors kept, recording interactions with protégés) indicated that students' feelings of confidence and success correlated to a higher GPA. The GPA of minority pre-health students steadily increased after the advent of HCOP on campus and continued to increase over the five years analyzed. Underrepresented minority applicants to health professions schools doubled over the five years post-HCOP when compared with five years pre-HCOP, during which acceptance rates remained virtually the same.

The Premedical Honors College (PHC) (http://portal.utpa.edu/utpa_main/daa_ home/cose_home/biology_home/biology_jp/jp_pmh) is an eight-year, high school-through-medical school pathway created through a collaboration between The University of Texas-Pan American (UTPA) and the Baylor College of Medicine (BCM) to increase the number of physicians in medically underserved areas of Texas. PHC students attend UTPA for their undergraduate education and receive conditional acceptance to BCM upon acceptance into the program. Scholarship assistance is available (undergraduate and medical school). Those who fulfill all PHC requirements and BCM prerequisites are accepted into BCM upon graduation from UTPA. An evaluation of PHC (Thomson, Ferry, King, Martinez-Wedig, & Michael, 2003) showed that the odds of medical school matriculation were seven times higher for PHC students than for non-PHC students. Additionally, PHC appears to have influenced the culture of UTPA, increasing the health-related interests generally.

Appendix IV: Summary of Task Force Focus Groups and Interviews

To get firsthand information about the milieu in which D/HH individuals navigate in order to pursue education and training in health sciences, the Task Force conducted interviews and four focus group sessions with individuals representing the following groups: D/HH persons employed in the health care industry; educators and D/HH students training for employment in the health care industry; persons who function as gatekeepers to admission to training programs, employment, and certification; and professionals involved in providing access services and technology. Comments made by participants apropos to the topic addressed are interspersed throughout this summary.

The focus group sessions were recorded using CART[16], with interpreters voicing for individuals who used sign language and no voice. The individual interviews were conducted using a variety of telecommunication media, including email, instant messenger, and video technology, and were summarized by the team leader.

Students and Educators

The panel of students were asked to talk about how they chose their profession; what hurdles they faced in pursuing degrees in health care and how they resolved them; accommodations made to assist them; difficulties faced and if those difficulties caused them to change focus while in the process; technologies they have used; and any suggestions they had for improving access for D/HH people in their chosen fields.

Barriers/Hurdles Faced

The first barrier cited was attitudes of both deaf and hearing people about their capabilities, i.e., perceiving them as not being up to the task or not qualified to function in the environment.

> *As a pre-med student, one of my current barriers is the attitude of my peers and professors. By attitude, I don't mean that they look down upon me or think that I'm less, but their expectations of me are different than those of my peers… The professor said, 'Well, how will you get into medical school?' I thought, 'I'll get into medical school just as they did: Study hard, work hard, I'll put forth the effort.' We're here for a reason. These are preparatory courses for all of us. 'But you're deaf,' the professor said. 'Well I know; what's new? There are deaf doctors out there in the world. Upwards of 30. I don't know. But they're out there!' The professor was taken aback by that. It was a very awkward moment.*

[16] Communication Access Realtime Translation (CART) – The instantaneous translation of the spoken language into text and displayed in various forms. English text is produced with less than a two-second delay. For example, a CART writer sits next to a student in a classroom and listens to the professor, transcribing all that is heard, and the English text is displayed on the computer screen so the student can read along.

They also are viewed as a possible safety risk.

> *I volunteered in Pediatrics, which went perfectly well, and when I rotated to the Emergency Room, I had asked the Emergency Department if there was anything they needed because I was going to be on the front line in the Emergency Department..... They said, 'No, you're deaf. Really, there's absolutely nothing you can do for us. You are a safety hazard; you put us at risk by being here.' … I said, 'I understand that, but I want to work with you. Let's collaborate and figure this out.' They would not go there with me, not even if a deaf person was a patient in the ER.*

During their early years, many D/HH students were advised--either directly or indirectly--to choose an "easier" field of study. Impatience about the extra time it sometimes requires to work with a deaf person was another factor. Assumptions about what it is like to work with a deaf health care professional that prevents that individual from addressing and establishing workable strategies also was mentioned. Perceptions about the costs of accommodating D/HH individuals working in health care-related fields were mentioned in all of the focus groups. Moreover, D/HH students felt further constrained by the limited number of internships/residencies available to them.

> *It's more of a barrier when we place students in their internship position external to Gallaudet, whether they are in social service agencies or other agencies that we're preparing them for.*

Other factors included concerns about not having interpreters available in spontaneous learning situations and the sense of isolation felt by D/HH students and professionals.

Other commonly cited hurdles had to do with operational impediments, some perceived, others built-in. After being accepted into a nursing program, one interviewee recalled the reaction when she attended a meeting with nursing school staff to discuss accommodations.

> *I asked for a meeting -- an in-service type meeting, had the interpreter with me, and everyone at that meeting was shocked. Why are we having this meeting, what's going on? They were dumbfounded. They had no idea how their program was going to handle accommodating my communication within the program as a D/HH student.*

One dilemma for D/HH professionals is that because some of them may use their voices effectively, hearing co-workers forget that these D/HH professionals cannot necessarily hear them, especially if the hearing person turns their head away or obstructs the view of their mouth when communicating. Licensure exams present unique problems because often the language construction of the questions is difficult or the exam contains phrases confusing to a deaf individual. In that respect, bias is created.

These problems are not always overcome simply by using an interpreter. Similarly, organizations create job descriptions or have procedures that assume certain physical requirements that preclude a deaf person from handling the job. A common example is use of the phone as the reason to limit deaf persons' participation in the profession.

> *I couldn't find full-time employment because all my phone interviews said that I needed to answer the phone to do my job and they focused in my interviews on my deafness as opposed to my practice with deaf patients and my psychology skills, and also the nursing aspect, as well. So I think these are big barriers we face -- that because I couldn't use the phone, therefore they assumed I couldn't do the job.*

In terms of meeting technical standards, one panelist noted that: *"…the institution doesn't determine how one will meet these technical standards; the responsibility for that is on the part of the trainee. It seems like they* [educational institution] *did that without giving that candidate an opportunity to demonstrate."*

Specific to health care environments, HIPAA (the patient privacy law) often has been interpreted as limiting an interpreter's participation. Computer security systems often limit use of email in health care environments. Many situations arise that are not covered by ADA rules, so the decision to provide access support sometimes comes down to whether or not employers think they can cover the perceived costs. Availability of qualified interpreters and lack of skilled mentors are other barriers to participation. Getting equal access to professional development training is problematic.

Strategies Recommended and Utilized to Meet Educational and Career Goals

D/HH students and health care workers on the panel were asked what they thought a young deaf person needed to achieve success in the health care arena. The most prominent qualities described were early love of math and science; belief in one's self and abilities; persistence in finding a means to navigate the educational system toward career goals; assertiveness; interest in helping people and giving back to underserved populations; love of reading; and a desire to continually improve one's skills.

Background Supports

The personal attributes conducive to educational and career success described by the panel participants are essential elements for any individual. D/HH individuals are no different in this regard. However, in order to succeed, they also need some additional supports. Panelists indicated that they primarily need help with *advocacy*. They benefitted from strong parental

support, influence, and mentoring, including being exposed to lots of things; supportive school counselors or teachers assisting them in pursuing goals; mentoring, including deaf and hard-of-hearing role models; educational environments with strong IEP programs; and more visual versus verbal input.

At the secondary level, panelists emphasized the importance of having hands-on experience to support career goals; job sampling – direct experiences to inform career interests; job shadowing experiences; opportunities to volunteer and experience work in a medical setting; and more informed VR support.

At the postsecondary level, panelists suggested having captioning for distance learning courses; an "ADA Kit" for college students on how to request interpreters and make things accessible; and consistent support for real-time captioning or C-Print™[17] versus only notetakers to ensure quality and completeness of the recorded classroom or lab sessions.

In terms of career decision-making, panelists recommended that D/HH students select areas where there is a real need, so as to improve their opportunities. They urged students to seek out the informed ADA offices at educational institutions if problems arose.

Improve Climate/Environment in Which D/HH Individuals Are Educated and Work

D/HH individuals preparing to enter the workforce should take an entry level position so that they can get enough on-the-job knowledge to pass any licensing exams, improving their chances of moving up the ladder in their careers. Ultimately, D/HH people need a way to "connect" with working professionals to help them navigate the career ladder system.

Underpinning these recommendations is the theme of persistence: don't give up and keep looking for technological and other ways to solve communication barriers that may arise in the work environment.

Specific Interventions

Panelists' recommendations included establishing science and social science magnet/talented and gifted programs for deaf high school students; contacting licensing boards to ensure that there is "deaf expert" input when writing up qualifying exams; allowing D/HH people to explain their needs so that decisions are made with informed input; developing guides for deaf students interested in applying for medical school; providing a mentor/support group to help review and coach for licensing exams; and having MCAT prep courses designed for deaf applicants.

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[17] C-Print™ is a speech-to-text system developed at the National Technical Institute for the Deaf (NTID), a college of Rochester Institute of Technology (RIT), as a communication access service option for some deaf and hard-of-hearing students in educational environments. C-Print™ is successfully being used to provide communication access to individuals who are deaf or hard-of-hearing in many programs around the country. In addition to educational environments, the system can be used in meetings and workshops and with individuals with other disabilities.

Needs

Panelists also suggested that Congress and the Department of Health and Human Services be informed of the needs of D/HH professionals; develop a dissemination strategy for findings regarding deaf health care workers; create awareness among the general public about social networks they can access to learn about D/HH students' needs or how to work with them; and have available literature that showcases deaf medical professionals.

Why D/HH Health Care Professionals?

There was no shortage of reasons expressed by participants as to why D/HH individuals need to be employed in the health care professions. They pointed out the value of minorities as opportunities to fill the need for underserved populations.

> *I think virtually every institution in this country is willing, and will provide support for, that exceptional student. Exceptional people always have gotten through the system. But you're not talking about just exceptional students…you're talking about a diversity program and enlarging the numbers. If you're going to do that, you have to have support services in place.*

Deaf doctors see their patients as appreciating them.

> *…The patients were able to communicate with me comfortably and clearly and I gave them the correct medicine and they got better. You know, sometimes it's beneficial to have a deaf doctor there because communication is more direct.*

> *I think that the more the health care workers are like the people they serve, the better job they can do serving them.*

> *I think having deaf professionals in the field can have a very strong impact on deaf patients receiving care in an equal manner and having open communication. There are cracks in the health care system. Sometimes there are misdiagnoses. Doctors aren't able to figure out what's wrong with a person because the deaf patients can't express themselves to their doctors properly, so it's difficult.*

People know that seeing a deaf health care worker means that the person is qualified, i.e., if they made it that far then you know they are capable; deaf health care workers appear to be better "listeners" - they look at the patient more in order to make sure they understand what the patient is saying, which in turn creates more patient confidence and cooperation.

Gatekeepers

Gatekeepers in this instance are persons who control access to educational opportunities in the health care professions. In order to investigate in what ways D/HH individuals encounter obstacles in getting into health careers, Task Force members interviewed eight individuals, including a dean of a pharmacy school, associate dean of a medical school, associate dean for student affairs at a medical school, senior associate dean for admissions and student affairs, vocational rehabilitation counselor, hospital chief and interim associate dean of clinical affairs, corporate vice president of organizational development and training, and an MD and retired dean of student affairs.

Concerns re: Accommodations and Communication

Concerns employers had with regard to admitting and employing D/HH individuals largely revolved around accommodations they would need to provide, lack of guidance and assistance on how to support D/HH applicants in the most cost effective and successful way, vague guidelines and laws, lack of awareness about accommodations, communication barriers with hearing co-workers and hearing clients, difficulty of handling last-minute accommodation requests, financial burdens of providing accommodations, concern about employees ending up in dead-end positions with little promotion opportunity, and the relatively small pool of applicants.

Questions for the Task Force

Gatekeepers posed a number of challenging questions to the Task Force.

How to:

- Raise low expectations and achievement among D/HH students, especially at an early age;
- Provide an easy-to-access manual on arranging educational accommodations for D/HH students and workers entering health careers and majors;
- Encourage greater dialogue between gatekeepers and deaf individuals to more effectively use accommodations and reduce anxiety;
- Develop a more equitable system in which accommodation costs are spread more evenly (i.e. creation of a federal funding source for employment and school accommodations);
- Better disseminate information on accommodation types, costs and benefits;
- Demonstrate how effective communication strategies can be achieved with as little negative effect as possible for patients and learning environments;

- Keep D/HH individuals more involved and engaged in the workplace (and educational system) as well as work or school-sponsored social events;
- Develop effective communication strategies, including use of technology, both for the present and the future.

Access and Technology in the Health Care Fields

A group of health care interpreting and technology experts were invited to discuss emerging applications and solutions to assist interpreters in health care settings. The individuals included two professional interpreters (one from NTID and another from the University of Rochester), the director of RIT's Center for Student Innovation, the associate director of NTID's Center on Access and Technology, and the external liaison and project manager from St. Catherine University in Minnesota. Discussion highlights included emphasis on the following:

Access: Interpreting and Training Needs

All interviewees indicated that there is a shortage of qualified specialty interpreters, which is compounded by a lack of formal training opportunities for health care specialization. The interpreter roles and functions in deaf professional/deaf interpreter relationships are complex. Interpreting for a D/HH health care professional differs from interpreting for D/HH patients because there is "doctor-speak" vs. "patient-speak"--i.e., doctors break things down when they talk with patients. When doctors talk to each other, they expect to be able to use the same lexicon, unique jargon, with additional shared experience knowledge that comes with the collegial team; the work is more intense, the content more advanced, the discourse more technical, and the interactions more complex. The ability to interrupt to ask for clarification doesn't always present itself; there is no "off-time"; one is on the move all the time; and interpreting environmental noises and incidental information both are crucial. The interpreter needs to be knowledgeable regarding the hierarchy of staff; expectations of professionals in various roles; power and status; race and ethnicity; goals of the health care team; how to be a team player; how to shadow working interpreters and hearing health care professionals; how to understand the demands of the specific work environments; laws such as HIPAA; medical decision making/interviewing; scrub techniques; and do's and don'ts of the operating room. In addition, basic courses of study are needed in the areas of diseases, pathology, anatomy and physiology, psychology, biology, and medications.

Other areas in which health care interpreters need training in order to be effective are health care systems, i.e., protocols and procedures; U.S. and non-Western approaches in health care; and hospice, community health, behavioral health, and 12-step programs. Interpreters in health care settings additionally need to have experience in using case conferencing/supervision methodologies in order to examine the decision-making and effectiveness of their work.

D/HH health care students and practitioners must negotiate difficult learning situations. Least accessible situations for them (without interpreters or other effective auxiliary aids and services) are laboratories, grand rounds, operating rooms, and patient rounds, because they involve informal conversations with colleagues, office chit chat, lunch conversations giving reports between shifts, noisy environments, incidental learning such as conversations while walking in a group, operating room codes, and impromptu things one cannot prepare for, all while prioritizing information that is coming all at once. Interpreters need to know how to handle these difficult situations.

Additional curriculum development in health care interpreting can provide qualified interpreters to meet the growing need for specialty interpreters in areas such as medicine and then have the interpreters not hired by the institution, but by the profession when needed—i.e., have a pool of interpreters ready to relocate temporarily to serve the need wherever it occurs or to serve as VRI interpreters when appropriate.

Access: Costs

Many of the panelists interviewed indicated that they experienced budgetary issues associated with providing interpreters for D/HH health care students and professionals, and budgetary concerns regarding funding for training and paying interpreters. As one person suggested:

With regard to interpreters and how to pay for that provision of services, why not have a national pool with appropriations set by Congress where everyone pays into the funding pool?... And again, I think trainee-specific versus institution-specific.

Access: Technology

A variety of technologies were mentioned by focus group members. Use of these varied depending on individual circumstances and preferences. Discussion consisted of both currently used and future technologies being researched.

Panelists elaborated on existing technologies believed to best meet the needs of D/HH persons employed in the health care industry. Some were described as '"low-technology" solutions such as pagers, computers, and the Internet (SMS texting, emails & video). Others included visual relays such as VP, Videoconferencing, VRS, and VRI. Speech-to-text technologies mentioned included closed captioning, CART, and C-Print™ that provide access in the classroom, along with assigned textbooks/readings made available on captioned CDs and DVDs. Use of the iPad, Kindle, or similar device is seen as being useful for assigned reading material. Health care-specific technologies such as the visual electronic stethoscope require training for appropriate use.

Future technological improvements that will benefit D/HH persons training for careers in health care include improved hearing aid/cochlear implant technology and algorithms to work with stethoscopes; improved stethoscope and blood pressure devices; video classroom capture with auto-captioning at low cost; high-powered mobile devices; voice recognition ap-

plications on smartphones; handheld CARTs; text-to-voice & voice-to-text, and voice-to-sign & sign-to-voice handheld technology; wireless VRI with 4G (for mobile phones), and faster wireless bandwidth; VRS on mobile devices; smartphone with built-in camera; interpreter mobility using portable hologram interpreters; advanced telemedicine technology; and visual access to information and communication.

Other suggested actions to improve the success of D/HH students and professionals in health care fields included use of see-through face masks; increasing the number of interpreters trained in medical terminology; a cross-training of interpreters and captionists so medical knowledge can carry over; centralized funding for access services; remote delivery of high quality services; all kinds of video technology to meet the needs of D/HH people; training of all health care professionals to achieve the best communication strategies in the workplace; increased use of email among colleagues/supervisors; audiology training for those D/HH students in medical school who benefit from auditory aids; and visual adaptations of medical equipment that currently uses high frequency sounds for alerts. When using robotics for surgery, panelists suggested that Internet-based communication be more accessible for D/HH people and that health care companies routinely use universal design when developing new products.

Medical schools need to understand that access solutions are available to professionals working in health care. Personnel also need to be educated about ADA laws so that medical schools are accessible to deaf and hard-of-hearing students. Some good resources include the Association of Medical Professionals with Hearing Losses (http://www.amphl.org/) and United Kingdom Health Professionals with Hearing Losses (http://hphl.org.uk). Ultimately, what is needed is a national campaign to educate the public about deaf and hard-of-hearing individuals and the contributions they can make to the health care arena.

Summary of Discussions and Interviews

A common thread running through these discussions with D/HH students, educators, health care professionals, interpreters, and information technology specialists is the issue of access to information, opportunity, training, and practice. The experiences of these individuals, both hearing as well as D/HH, provide rationale and guidelines for increasing opportunities for D/HH individuals to contribute to the health care professions. While it is a testimony to their intelligence and perseverance that many of the D/HH interviewees surmounted numerous roadblocks on their way to entering the health care field, the goal of this Task Force is to investigate how this pathway to health care careers can be cleared of obstacles for future D/HH individuals.

Appendix V: Charge to Task Force on Health Care Careers for Deaf and Hard-of-Hearing Community

Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community

Task Force Charge

Issued June 4, 2010

Our country has just completed a successful effort to broaden and reform our national health care system.

One of the major challenges now facing us in fulfilling the demands of this recently passed legislation is the critical shortage of health care specialists at all levels of training to care for the citizens of our nation.

This challenge coincides with another, much lesser known serious challenge; the limited opportunities for qualified deaf and hard-of-hearing individuals in this country to pursue careers in health care. Factors underlying this problem include:

- Limited educational opportunities,
- Widely held perceptions among the general population that health care careers are not appropriate for deaf and hard-of-hearing individuals, and
- An insufficient number of deaf and hard-of-hearing health care professionals currently "at the table as insiders" to advocate for the needs and promise of people with hearing loss.

In response to this challenge, the following institutions have formed a *Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community:*

1. The National Technical Institute for the Deaf at Rochester Institute of Technology
2. Gallaudet University
3. The National Center on Deaf Health Research at the University of Rochester Medical Center
4. Rochester General Health System.

The Task Force, fueled by this unique partnership, represents an historic initiative, one national in scope. Its overall aim is to expand opportunities for deaf and hard-of-hearing individuals within health care professions through increased accessibility strategies and options, the coordination and development of educational programs, and enabling policy.

The Task Force will address the following three major Guiding Questions over its 18-month timeline:

1. What can be done immediately and in the short term to expand opportunities for deaf and hard-of-hearing individuals within health care professions? As part of this consideration, what are existing accessibility strategies and options for ensuring communication support and information access both for deaf and hard-of-hearing individuals training to become members of a wide variety of health care professions and for those already in the health care professions?

BECAUSE OF THE SHORT-TERM NATURE OF THIS GUIDING QUESTION, THE TASK FORCE WILL REPORT ON THIS ISSUE BY JUNE 30, 2011.

2. What new educational curricula and training programs and new articulation agreements among existing curricula and training programs are needed for expanding opportunities for deaf and hard-of-hearing individuals within health care professions?

    a) Within this longer time frame, and with regard to ensuring communication support and information access both for deaf and hard-of-hearing individuals training to become members of the health care professions and for those already in the health care professions, what are emerging accessibility strategies and options?

    b) For both deaf and hard-of-hearing individuals training to become members of the health care professions and for those already in the health care professions, what are effective and efficient strategies and options for ensuring supportive and productive "learning and professional development environments"?

3. What national governmental policies and both private and public funding sources are needed to support expanded opportunities for deaf and hard-of-hearing individuals within health care professions? What are fruitful areas for national and international programs of applied research, technological innovation, and policy studies regarding health care and deafness, with broader implications for disability groups in general?

An *Interim Report* regarding Guiding Question #1, and a culminating *Final Report* detailing recommendations in response to all three Guiding Questions will be the products of the Task Force, and represent fulfillment of the Task Force Charge. The *Interim Report* is due by June 2011; the *Final Report* is due by the end of March 2012.

Appendix VI: Summary of Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report

The Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community was established in June 2010 to address the disparities D/HH individuals experience in preparing for and entering health care careers. (See Appendix V, p. 112 for a copy of the Task Force Charge.)

The Task Force held five meetings during 2010-11, at Gallaudet and at NTID, before producing its *Interim Report*. These meetings focused on reviewing educational and occupational demographics of the D/HH population as related to health care fields and collecting, collating, and summarizing information from three focus groups, 49 individual interviews, and significant commentaries from various constituencies regarding access to health care professions.

Among the critical issues that emerged were barriers to career awareness information and communication in educational and workplace settings, needed accommodations (including access technologies), instructional and professional development strategies supportive of visual learners, assumptions and practices of gatekeepers (people responsible for admission to education and employment), the need for robust academic skills among D/HH students, effective "academic pipelines" leading to health care careers, and issues related to existing assessment and standards-setting practices that restrict program admission and professional credentialing opportunities for D/HH individuals throughout health care fields.

In June 2011, the Task Force's first set of recommendations was published in *Building Pathways to Health Care Careers for the Deaf and Hard-of-Hearing Community: Interim Report* (Task Force on Health Care Careers for the Deaf and Hard-of-Hearing Community, 2011; http://www.rit.edu/ntid/hccd/system/files/Task%20Force%20June%20Interim%20Report%206%2030%202011.pdf). This report described short-term recommendations that could be undertaken by the founding institutions through re-allocation of existing institutional funds within a 12-month period, either in collaboration with each other, by working with national partners as appropriate, or by working alone. Recommendations were organized within the following categories:

1. Maximizing Information Dissemination
2. Enhancing Educational Curricula and Training Programs
3. Creating Employer Awareness
4. Promoting Accessibility and Technological Solutions
5. Investigating External Funding, Cultivating Governmental Relations, and Creating Programs of Sponsored Research/Policy Development.

These recommendations, summarized on the following pages, represent a critical intermediate step in fulfilling the Task Force's charge of increasing the numbers and successes of D/HH individuals in health care careers. They also set the foundation for the more comprehensive recommendations outlined in Chapters 2 to 4 of the *Final Report*.

I. Maximizing Information Dissemination

Findings:

A repeatedly cited challenge toward increasing the numbers of D/HH individuals in health care fields was the paucity of information readily available to D/HH students, their parents, educators, academic advisors, vocational rehabilitation personnel, educational institutions, licensing boards, professional testing services, and employers in the health care industry. As a result, D/HH students typically are not aware of the requirements or of the range of career possibilities in health care fields. Health care industry employers also are not aware of technological and access issues, as well as solutions available to meet D/HH students' needs in health care careers.

Recommendations:

The Task Force recommended that the founding institutions, in collaboration with other key organizations and national partners, establish and maintain a comprehensive website and create a public relations campaign regarding health care careers for D/HH students aimed at students, parents, educators, and other professionals working with D/HH individuals, gatekeepers in educational institutions, and health care employers. This site will provide information about health care fields, including available mentoring/shadowing opportunities; success stories of D/HH health care professionals; accessibility services and technologies specific to health care settings; and career awareness opportunities for middle, high school, and college students. The public relations campaign will reach audiences through "traditional" products, such as conferences, brochures, public service announcements, etc. Additionally, the Task Force recommends developing and disseminating print and video/DVD materials for younger D/HH students to explain various careers in health care; developing a network list of health professionals willing to provide mentoring experiences; and establishing a "Speaker's Bureau" at Gallaudet University and RIT/NTID to showcase successful D/HH individuals in health care fields.

Action plans:

RIT/NTID will assume central leadership in creating, developing, and maintaining the recommended website, with ongoing support and contributions from Gallaudet, NCDHR, and RGHS. This website should become public by October 2012. Gallaudet has agreed to lead the public relations campaign, in collaboration with RIT/NTID and with assistance from RGHS, the Laurent Clerc National Deaf Education Center at Gallaudet, and other regional and national organizations. It is expected that this public relations campaign will be launched by October 2012. Gallaudet will work with the Laurent Clerc Center to develop materials appropriate for middle and high school D/HH students and will develop a video/

DVD/Webinar focusing on optimal access and accommodation strategies. All four institutions will partner in developing a network list of health care professionals for mentoring and publicity purposes. Gallaudet and RIT/NTID, collaborating with RGHS and NCDHR, will sponsor a Speaker's Bureau, and will collaborate with key organizations, including the new Postsecondary Education Center for Individuals Who are Deaf (located at California State University, Northridge) to disseminate materials. Gallaudet and RIT/NTID will take the lead in forging liaisons with testing companies and local, state, regional, and national certification and licensing agencies to ensure the validity of "high stakes" assessment measures for D/HH individuals as these measures are critical for entry into training programs and employment.

II. Enhancing Educational Curricula and Training Programs

Findings:

Academic programs that prepare individuals for careers in health care are rigorous and require a high degree of skill in English, mathematics, and science. D/HH students in particular have significant difficulties gaining access to challenging educational environments (Walter, 2010). Overall, college graduation rates for D/HH individuals tend to be lower than the 50% national average (Kuh, Kinzie, Schuh, & Whitt, 2010). The need for improved rigor in educational curricula is clear.

While there is considerable literature available that describes and evaluates "pipeline" programs to encourage minority and disadvantaged youth to enter health care professions (U.S. Department of Health and Human Services, 2006; Smith, Nsiah-Kumi, Jones, & Pamies, 2009; U.S. Department of Health and Human Services, 2009), virtually no literature is available on such programs for individuals who are D/HH.

"Pipeline" programs targeted toward minority students indicate that positive outcomes are possible for underrepresented groups in gaining entrance to and graduating from health care training programs. It could thus be inferred that such programming could be viable both in the short term and long term for individuals who are D/HH.

Recommendations:

The Task Force recommends that the founding institutions lead a coordinated plan of pre-college, college, and post-college enrichment and training programs that assist D/HH individuals in preparing for and obtaining employment in health care professions. This includes incorporating information and activities pertinent to health care fields within programs currently available at RIT/NTID, Gallaudet, UR, and RGHS, for pre-college, college, and graduate-level students who are D/HH. These institutions also should consider creating inter-institutional and intra-institutional degree programs in health care careers. One suggested feasibility analysis describes a jointly sponsored Consortium Center of Excellence in

Health Care Education resulting in various exit points for D/HH students. Ultimately, these efforts could lead to increased numbers of D/HH students entering health-related fields.

Action plans:

Relative to pre-college programs, RIT/NTID will begin incorporating health care careers awareness as part of its "Explore Your Future" program for high school students in summer 2012; will collaborate with RIT Outreach initiatives for middle/high school students beginning in 2012; will sponsor a National Health Care Careers Summer Academy by summer 2013; and will offer dual credit courses to high school students wishing to pursue health care careers beginning in 2013. With RIT/NTID and Gallaudet support, NCDHR will pursue expanding UR's Science and Technology Entry Program to incorporate pre-college D/HH students. Gallaudet will partner with its Regional Centers to provide outreach programs related to health care careers. RGHS will explore opportunities to incorporate D/HH students into its Youth Apprenticeship and New Visions programs, both aimed at high school students wishing to enter health care careers.

For D/HH students already in college, all four institutions will identify job shadowing, mentoring, and internship opportunities for D/HH health care majors. Both RIT/NTID and Gallaudet will have clearly established health care careers mentors and advisers and will establish a Health Care Careers Scholars Program for students in health care majors. NTID will partner with RIT's new College of Health Sciences and Technology (CHST) to assure a "deaf friendly" environment for qualified D/HH students. Both Gallaudet and RIT/NTID will collaborate with URMC to increase the numbers of D/HH students in URMC's Summer Research Fellowship Program. The initial cohort of recruited students is planned for summer 2012.

Relative to programs of study in health-related fields, RIT/NTID will explore the development of an AOS degree in a high growth health care area, a transfer AS or AAS degree that would link to a related BS degree program in RIT's College of Health Sciences and Technology (CHST) and a joint AS or AAS degree with Monroe Community College (MCC) in health care fields. Gallaudet is preparing a formal pre-medicine course of study and the infusion of a social work practice in medical settings in its undergraduate and graduate programs in Social Work. RIT/NTID, Gallaudet, and NCDHR will discuss the feasibility of a Consortium Center of Excellence in Health Care Education. Gallaudet has begun to explore joint degree programs with other institutions in the Consortium of the Washington Metropolitan Area and will expand these discussions to include joint degree programs leading to careers in medicine and allied health fields.

Relative to post-college opportunities, RIT/NTID will assume leadership (in collaboration with NCDHR; CHST; RGHS; the University of California, San Diego (UCSD); and Gallaudet) for identifying mentoring opportunities for new D/HH college graduates; will collaborate with UR in expanding the Deaf Health Pathway Program; and will work with the Association of Medical Professionals with Hearing Losses organization, the Institute on Health Science Outreach Center at RIT, and other regional/national partners to assist D/HH college graduates seeking jobs in health care fields. Several of Gallaudet's undergraduate and graduate programs will identify internships and post-baccalaureate opportunities for D/HH

students in medical and allied medical settings. Gallaudet will continue to place graduate students from its Social Work, Audiology, and Clinical Psychology programs in medical settings. Gallaudet also will begin efforts to establish a doctoral program in Cognitive Neuroscience in 2014.

III. Creating Employer Awareness

Findings:

Health care organizations, health industry employers, and gatekeepers (people or organizations who provide guidance and/or enable access to career fields) often do not know the value that successful D/HH health care professionals can bring to an organization. These individuals must be educated about the D/HH community, the skills and training available within this potential pool of employees, how access services and technological innovation can benefit their organization while lowering traditional communication barriers, and the overall benefits of having this diverse group of individuals in the health care workplace.

While both Gallaudet and RIT/NTID have career centers for students and provide employer training to support cooperative work experiences and student placement, more outreach, training, and resources must be available to employers interested in hiring D/HH people for positions in the wider spectrum of health care.

Recommendations:

The Task Force encourages the founding institutions to adapt existing national employer training programs to address health care organizations' ability to support the ongoing professional learning, advancement, and therefore, success, of D/HH employees. Existing resources should be allocated so that such modified programs are available to a broad spectrum of current and identifiable prospective organizations that employ or could employ D/HH health care workers in the future (this includes cooperative positions, internships, and potential entry-level positions). The Task Force also asked that potential partners within the corporate sector of the health and wellness industry be encouraged to develop employment opportunities for the increased number of D/HH individuals who will be trained for the health care industry.

Action plans:

RIT/NTID will assume central leadership in working with the other founding institutions to sponsor one national training pilot for health care employers. Gallaudet will provide consultation and independent assessment services. NCDHR will support the consolidation of available health care career training information, which focuses on the needs of D/HH patients and D/HH providers, so that this information can be shared nationally. This includes provid-

ing information on procedures for acquiring American Sign Language (ASL) interpreter support for projects funded by the U.S. Department of Health and Human Services and other federal agencies. RIT/NTID, in collaboration with Gallaudet and other national partners, will develop a list of potential partners and employers who could be tapped as D/HH students enter the health care career "pipeline."

IV. Promoting Accessibility and Technological Solutions

Findings:

In order for D/HH persons to enter the "pipeline" to educational programs and achieve ongoing career success, they must be able to access information and instructional processes required to achieve desired goals. While existing federal legislation requires the provision of access services where needed to support full participation of D/HH individuals, Task Force focus groups and interviews reveal significant access concerns that hinder the success of D/HH individuals in health care fields. These challenges include the cost and quality of access services as well as awareness of the variety of access technologies and services available.

The scope and associated costs of access services include not only the classroom, but any off-site learning situations essential to health care-related professions, such as internships in medical care environments, job-related activities, and teamwork on collaborative projects that take place outside the classroom. Unfortunately, many institutions hesitate to admit D/HH students into professional programs or employ D/HH individuals because of the financial burden they incur in providing access services.

Another challenge is the limited availability of quality access services, particularly access technologies such as amplified or visual stethoscopes or specialized sign language interpreters. RIT/NTID's recently established certificate program in Health Care Interpreting focuses primarily on deaf patients within the health care system; it does not currently address the complex interpreting skill sets needed for interpreting for D/HH students in health care education.

Many schools and employers are not aware of access services and/or technologies. They need current information about these services and technologies, as well as emerging technologies, both of which could remove barriers to communication and work responsibilities. Many D/HH professionals in the field describe how assertive they needed to be on a daily basis in order to achieve the access needed to do their jobs.

Recommendations:

The Task Force recommends that the partnering institutions support the identification and development of "best practices" with respect to specialized interpreting for D/HH individuals in health care fields and the increasing array of available technological applications. This includes working with national organizations and partners in promoting awareness of com-

munication access services and technological innovations as well as creating opportunities to provide technical assistance and consulting in best practices for individuals and organizations seeking information about access services in the context of health care preparation and employment.

Action plans:

RIT/NTID, working closely with Gallaudet, will assume central responsibility for supporting the development and delivery of an online curriculum for specialized interpreters working with D/HH students and professionals in health care settings; identifying shadowing opportunities for interpreters in health care settings; developing a Web-based program for delivering supervision for health care interpreters; sharing information about the Certificate in Health Care Interpreting with other interpreting programs across the country; developing guidelines/policies on hiring specialized interpreters; collaborating with the Rehabilitation Services Administration (RSA); connecting the Registry of Interpreters for the Deaf (RID) with spoken language interpreting organizations; and publicizing/supporting the ASL STEM (Science, Technology, Engineering, and Mathematics) Forum. RGHS will collaborate with the other founding institutions to provide interpreting opportunities for students in medical interpreting programs.

RIT/NTID, in consultation with Gallaudet, will take the lead in working with national organizations and partners to promote awareness of technological innovation in delivering access services. It also will set up a health care access and communication consulting service that will house a technology lab where common assistive devices can be tested. Gallaudet will provide support and expertise from its Rehabilitation Engineering Research Center and will allocate resources from Gallaudet's Technology Services to support prototype development and testing. NCDHR and RGHS will provide testing and evaluation sites and will contribute technical expertise.

V. Investigating External Funding, Cultivating Governmental Relations, and Creating Programs of Sponsored Research/Policy Development

Findings:

Many Task Force recommendations require funding and policy support from state and federal governments. In addition, a rigorous and comprehensive research program will be critical in terms of gauging the effectiveness of interventions spearheaded by the partnering institutions and informing future policy development. While reallocation of existing resources and small pilot funds may be sources of funding for short-term solutions, the founding institutions must investigate federal and private funding opportunities to support both research and training programs in support of long-term goals.

Recommendations:

The Task Force recommends that the Governmental Relations Specialists at each of the four founding institutions collaboratively initiate and maintain contact with relevant local, state, and federal agencies, as well as private foundations and individual donors, to inform them about the Task Force goals and recommendations. Where appropriate, the institutions should ensure that the language of "eligibility criteria" for specific funding opportunities relevant to Task Force recommendations is inclusive of D/HH individuals and the institutions that serve them or that additional funding opportunities be established that are inclusive of D/HH individuals. Representatives of the founding institutions also need to explore how legislators might help with resources to expand upon those short-term recommendations having the most promise. The Task Force also recommends that the founding institutions create an ongoing inter-institutional model for supporting a Sponsored Research/Policy Development Committee characterized by strong collaboration and central leadership. Finally, in coordinated fashion, Development officers at the partnering institutions should explore pilot funding from private foundations and individual donors for select short-term recommendations.

Action plans:

All partners will initiate and maintain contact with funding sources to determine qualifications for specific funding opportunities in implementing Task Force recommendations and will share their findings with the other founding institutions to seek partnerships in grant proposal preparation. Gallaudet will advocate for changes in agency interpretations of definitions as appropriate and/or seek additional legislative authorizations, in collaboration with the founding institutions.

All partners will be part of the Sponsored Research/Policy Development Committee, which will serve as a collaborative "resource hub" during the proposal development phase, when the possibility of bringing to bear areas of complementary expertise among the founding institutions can be explored, and during the phase of analysis regarding the findings of completed research projects in drawing out policy implications. Gallaudet will be the primary leader for research and resulting policy development regarding instructional and curricular innovation related to health care preparation and professional development. RIT/NTID will be the primary leader for technological advancements providing access services related to health care preparation and professional development and for employment outcomes and career trajectories related to health care careers.

Finally, Development officers at the four founding institutions will begin ongoing collaboration/coordination regarding private funding sources to support the short-term recommendations.

These short-term recommendations and action plans represent important steps that will begin the process of significantly increasing the numbers of D/HH individuals entering this growing segment of the workforce.

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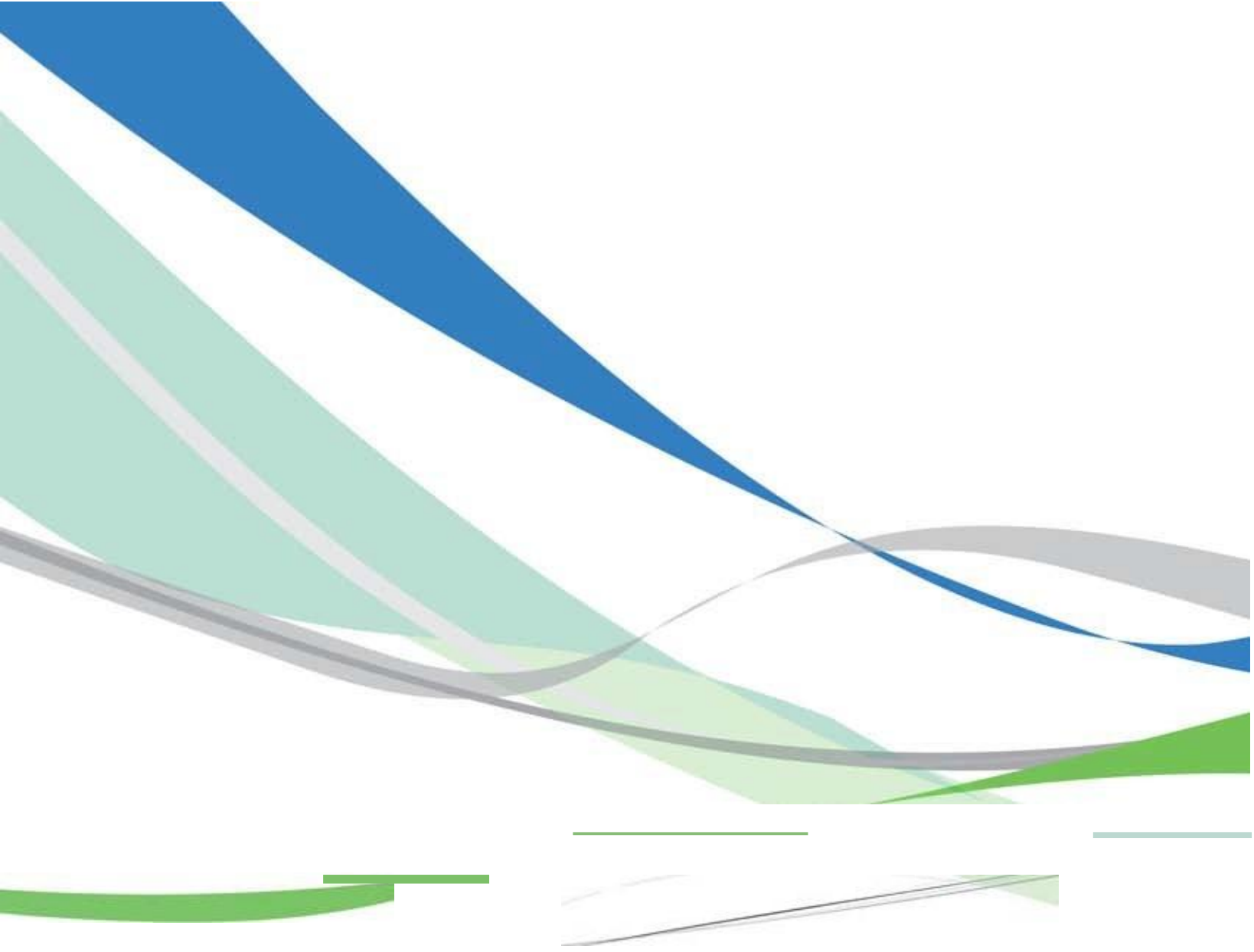

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