

# Workers & Workplaces

## Call for Papers

### *Enough Workers? Doing What? Explorations of Workers & Workplaces*

*Chair: Kristine M. Gebbie, Dr.P.H., R.N.*

Monday, June 24 ● 9:45 a.m. – 11:15 a.m.

#### ● **The Effect of Nurse practitioners and Physician assistants on Primary care physicians referral practices**

Kyusuk Chung, Ph.D., Ross Mullner, Ph.D., Duck-Hye Yang, Ph.D.

**Presented by:** Kyusuk Chung, Ph.D., University Professor, Health Administration Program, Governors State University, College of Health Professions, University Park, IL 60466; Tel: (708) 534-4047; Fax: (708) 534-8041; E-mail: k-chung@govst.edu

**Research Objective:** To examine the impact of nurse practitioners (NPs) and physician assistants (PAs) on primary care physicians (PCPs) practices.

**Study Design:** Cross-sectional analysis using multivariate statistical methods (loglinear and weighted regression).

**Population Studied:** Data for this paper are from the Robert Wood Johnson Foundation sponsored Community Tracking Study (CTS) Physician Survey for 1996-1999. This national survey included 16,384 qualifying primary care physicians, representative of direct patient care PCPs in the United States.

**Principal Findings:** PCPs who have NPs/PAs in their practices are likely to spend more time with patients ( $p < 0.01$ ), especially those patients with complex conditions. These practices also have fewer referrals to specialists ( $p < 0.01$ ) than do PCPs who do not have NPs/PAs in the practices. These two variables (time with patients and the complexity of conditions) explained 23% of the variation in the decrease in the number of referrals to specialists ( $p < 0.05$  and  $p < 0.01$  respectively). Managed care related variables (increase in practice size, the percentage of patients for whom PCPs role as gatekeeper, and the percentage of revenue from capitated/prepaid contracts) were important determinants of whether PCPs had NPs/PAs in their practices, but not important determinants of PCPs' referral behavior.

**Conclusions:** These findings indicate that NPs/PAs contribute to collaborative physician practice by giving PCPs more time to concentrate on more complex cases and thus reduce the number of referrals to specialists.

**Implications for Policy, Delivery or Practice:** Medical education must address these newly evolving roles for PCPs/NPs/PAs. In addition, evaluating the performance of collaborative PCPs/NPs/PAs practice requires an integrated view of the roles that PCPs/NPs/PAs play.

**Primary Funding Source:** GSU Research Fund

#### ● **Competencies for Health Care Workers in Public Health**

Chris Day, M.P.H., Ron Bialek, M.P.P., Diane Downing, R.N., M.S.N.

**Presented by:** Chris Day, M.P.H., Analyst, , Public Health Foundation, 1220 L. Street, N.W., Suite 350, Washington, DC 20005; Tel: (202) 898-5600 ext. 3017; Fax: (202) 898-5609; E-mail: cday@phf.org

**Research Objective:** Develop a consensus set of core competencies for public health professionals including the more than 55,000

physicians and nurses estimated to be part of the public health workforce, in addition to the other healthcare professionals contributing to public health.

**Study Design:** Forty-five sets of general and discipline-specific public health competencies developed over the past decade by various concentrations within the field of public health such as preventive medicine, nursing, leadership and management, health education and environmental health served as a baseline for the project. First, these were cross-walked with each other for the purpose of pulling out common elements and competencies. Second, these competencies were cross-walked with the 10 Essential Public Health Services to ensure that they all would lead to the development of skills and competence necessary for delivery of services to communities. Third, experts in the area of public health competencies were consulted for the purpose of refining a list of competencies for public comment. This resulted in establishing a list of 68 competencies that were grouped under eight categories (domains). Fourth, an extensive public comment period over a six-month period was used to further refine and validate the competencies. Public hearings, meetings with national organizations, email discussions, and a website were used for obtaining comments. The list was finalized after considering the public comments and additional review by experts and members of the Council on Linkages Between Academia and Public Health Practice, an organization charged with improving the relevance of public health education to the demands of public health in the practice sector. Subsequently, the final list was distributed to public health agencies and organizations throughout the United States. Through meetings, the Council on Linkages website, mailings, email and phone calls, agencies, organizations and states were identified as utilizing the final list of core competencies for workforce development initiatives.

**Population Studied:** Public health professionals in academia and public health practice.

**Principal Findings:** Public health professionals saw this effort as much needed. Over 1,000 reviewers submitted written and oral comments from web site ([www.TrainingFinder.org/competencies](http://www.TrainingFinder.org/competencies)), public hearings and meetings, focus groups, and email. Many respondents (N~700) were experienced public health professionals with 11 or more years of experience. By occupation, most of the respondents were administrators or managers (N~290), however there was also a significant response rate from nurses (N~272) and physicians (N~102). Most respondents worked in an academic setting or in a state or local government. Geographically, every state was represented. Participants did not indicate that any of the competencies in the draft list needed to be removed. Responses also indicated that many competency domains were more relevant to higher level or supervisory and management staff, however no competencies were seen as irrelevant to any level of job category. The Wisconsin Department of Health and Family Service's Division of Public Health demonstrated the most broad-based approach by incorporating language into Wisconsin's State Health Plan for 2010 recommending the utilization of workforce competencies to ensure a diverse, adequate, and competent workforce to support both local and statewide public health systems. Other identified themes for competencies integration initiatives included: 1) statewide quality assurance/quality improvement planning effort, primarily focused on public health nursing; 2) job description and performance evaluation development; 3) workforce gap analyses and needs assessments; 4) development of training curriculum for front-line public health and healthcare workers; 5) the development of online competency-based training courses for public health workers.

**Conclusions:** The use of focus groups, town hall meetings, presentations at national conferences, and the Internet was an effective way to solicit comments from a wide spectrum of people. Based on the number of respondents, this means of public comment created an "appetite" and "readiness" for the final product. Even before the competencies were finalized, education and training programs began using them for needs assessments and curriculum development. This effort was, in a sense, validated by numerous

national, state, and local agencies and organizations delivering the 10 Essential Public Health Services including the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA), which are utilizing the core competencies in unique ways to advance and strengthen workforce development efforts.

**Implications for Policy, Delivery or Practice:** The final list of core competencies for public health professionals will guide public health workforce development efforts. These competencies will ultimately help guide curriculum and content development of public health education and training programs for public health professionals and front-line healthcare workers. They may also be used by those in the practice setting as a standard by which staff are hired and evaluated, and may serve as a foundation for further discussions about credentialing of the public health workforce. This activity is aligned with other national efforts related to workforce development.

**Primary Funding Source:** HRSA

### ● **The Magnitude and Consequences of Work-Related Violence:**

#### **The Minnesota Nurses Study**

Susan Gerberich, Ph.D., Patricia McGovern, Ph.D., M.P.H., Patricia McGovern, Ph.D., Tim Church, Ph.D., Helen Hansen, Ph.D., Nancy Nachreiner, M.P.H., R.N., Mindy Geisser, M.S.

**Presented by:** Patricia McGovern, Ph.D., M.P.H., Associate Professor, Division of Environmental and Occupational Health, University of Minnesota School of Public Health, Mayo Bldg, MMC 807, 420 Delaware St. SE, Minneapolis, MN 55455; Tel: (612) 625-7429; Fax: (612) 626-4837; E-mail: pmcg@umn.edu

**Research Objective:** Identify the incidence and outcomes of work-related violence among nurses.

**Study Design:** In this retrospective cohort study, work-related violence was defined as the intentional use of physical force or emotional abuse that resulted in physical or non-physical violence (including, threat, sexual harassment and verbal abuse). A mailed survey addressed work history, demographics, violence, and factors associated with violence, e.g., environmental and event characteristics, health and work consequences. Logistic regression analyses were conducted to estimate odds ratios for potential risk factors and confounders; re-weighting adjusted for unknown eligibility and non-response

**Population Studied:** 57,388 Registered Nurses (RNs) and 21,740 Licensed Practical Nurses (LPNs) licensed in Minnesota as of October 1, 1998; a random sample of 6,300 nurses working in Minnesota was selected.

**Principal Findings:** The estimated response rate was 78%. The average nurse was female, and 46 years old. The adjusted physical assault rate per 100 person years was 16 for LPNs and 12 for RNs. Regression results revealed the odds ratios for a physical assault decreased with age (0.985/year) and increased for: men (1.5); work at a long term care (2.4) or rehabilitation facility (1.8) compared with an inpatient hospital; assignment to an emergency (2.1) or psychiatric department (1.9) compared with medical/surgical; and care of geriatric patients (2.0) compared with adults. Injuries included bruises/contusions (34%), temporary discolorations/slap marks (22%) and lacerations/scratches (18%). Emotional outcomes included frustration (47%), anger (33%), and fear/stress (26%); 8% reported persistent problems. Over 5% of nurses reported work restrictions and 2% quit or transferred voluntarily.

The non-physical violence rate (including threat, harassment and verbal abuse) per 100 persons per year was 39.7 for LPNs and 38.5 for RNs. Regression results revealed the odds ratios for non-physical violence decreased with age (0.98/year) and increased for: work at a rehabilitation (3.5) or long term care facility (1.4) compared with inpatient hospital; assignment to a psychiatric (3.4), emergency (2.7) or intensive care (1.4) department compared with medical/surgical; and care of geriatric patients (1.2) compared with adults. Emotional outcomes included frustration (61%), anger (60%), and fear/ stress

(40%), irritability (27%), sadness (21%) and fatigue (20%); 13% of nurses reported persistent problems. Work restrictions resulted for nearly 9% of the nurses and 9% quit or transferred voluntarily.

**Conclusions:** The incidence of non-physical violence (including threat, harassment and verbal abuse) was nearly three times greater than physical violence. Common risk factors were environmental (e.g., primary work in a long term care or rehabilitation facility; assignment to an emergency or psychiatric department; caring for geriatric patients). Emotional sequelae were important repercussions for physical and non-physical violence, and surprisingly, more common for non-physical violence.

**Implications for Policy, Delivery or Practice:** Voluntary guidelines to prevent work-related violence among health workers have been available through the Occupational Safety and Health Administration since 1996; yet, these nurses reported significant violence. Given the nursing shortage, health care administrators would benefit by working collaboratively with nursing staff, occupational health and safety professionals, and supervisors to identify high-risk environments and associated prevention and control measures to enhance working conditions.

**Primary Funding Source:** The National Institute for Occupational Safety and Health

### ● **Relative Demand for Physicians by Specialty in New York State, 1998-2001**

Joseph Nolan, M.S., Edward Salsberg, MPA, Edward Salsberg, M.P.A., Gaetano J. Forte, B.A.

**Presented by:** Edward Salsberg, MPA, Executive Director, Center for Health Workforce Studies, School of Public Health, University at Albany, State University of New York, 1 University Place, Suite 200, Rensselaer, NY 12144; Tel: (518)402-0250; Fax: (518)402-0252; E-mail: ess02@health.state.ny.us

**Research Objective:** To assess demand for physicians by specialty using an annual survey of residents completing training.

**Study Design:** An annual survey of all physicians completing a residency or fellowship training program in New York State between 1998 and 2001. The survey is conducted in collaboration with the teaching hospitals in the state. The questionnaire, completed by each individual resident, collects extensive information on their demographic and educational background, their post-training plans and their perceptions of the job market for new physicians. Over 3,000 residents completed the survey in 1998 (66% response rate); 3,400 completed the survey in 1999 (73% response rate); 2,800 completed the survey in 2000 (65% response rate); and 2,800 completed the survey in 2001 (65% response rate).

**Population Studied:** All residents and fellows completing a residency training program in New York State in 1998, 1999, 2000, and 2001.

**Principal Findings:** Despite the rich supply of physicians in New York State, demand for new physicians is high. In 2001, only 5% of survey respondents with permanent citizenship status had not received any job offers prior to graduation. In addition, while 30% of respondents reported some difficulty finding a satisfactory practice position, only 18% of these attributed their difficulty to an overall lack of jobs. However, there were significant differences in respondents' job market assessments for different specialties even when controlling for a respondent's location of medical education (USMGs vs. IMGs). Based on a variety of indicators, the demand for residents completing training in primary care specialties (including Family Practice, General Internal Medicine, General Pediatrics, and Combined Internal Medicine & Pediatrics) was less than the demand for non-primary care specialists. For example, the income of primary care physicians was well below specialist incomes and the difference grew over time. Demand was particularly high for some specialties, like dermatology, gastroenterology, anesthesiology, and radiology.

**Conclusions:** Despite predictions that the nation was going to face a surplus of physicians by the end of the twentieth century, the demand

for physicians, even in a state with one of the highest physician to population ratios in the nation, was high between 1998 and 2001. In fact, job opportunities in the state for new physicians in most specialties improved over the period. Although New York has a high ratio of non-primary care specialists to primary care physicians, the demand for non-primary care physicians exceeds that for primary care specialties.

**Implications for Policy, Delivery or Practice:** National policies designed to discourage additional medical school capacity, to reduce physician supply and to increase the ratio of primary care to non-primary care physicians appear to run counter to the current marketplace dynamics. The apparent low demand for primary care physicians may reflect lower need than expected or the need to revise reimbursement policies for primary care services.

**Primary Funding Source:** HRSA

● **Regional Patterns of the Supply and Demand for Pharmacists**

Surrey Walton, Ph.D., Judith A. Cooksey, M.D., M.P.H., Katherine K. Knapp, Ph.D., James M. Cultice, B.S.

**Presented by:** Surrey Walton, Ph.D., Assistant Professor, Pharmacy Administration, University of Illinois Chicago, 833 S. Wood Street Rm. 241, Chicago, IL 60612-7231; Tel: (312) 413-2775; Fax: (312) 996-0868; E-mail: Walton@uic.edu

**Research Objective:** Recent research has identified a shortage in the labor market for pharmacists. Moreover, there is evidence that the degree of the shortage differs across states and regions in the US. The purpose of this paper is to examine available data to assess state and regional differences in the labor market of pharmacists.

Specifically, we examine variation in new pharmacist graduates and employed pharmacists relative to population, and excess demand for pharmacists across regions in the US.

**Study Design:** The study describes a baseline active pharmacist count (1991), cumulative counts of new graduates in the 1990s, employed pharmacists in 1998, and excess demand for pharmacists across regions in the US. Patterns in new graduates were compared with regional data on employed pharmacists and excess demand.

**Population Studied:** The total number of licensed pharmacists in 1991 were examined using data collected by the Pharmacy Manpower Project (PMP) through state licensure surveys. New graduates were examined using data from the American Association of Colleges of Pharmacy. Pharmacist employment was examined using Bureau of Labor Statistics data (National Industry Occupation Employment Matrix). Total population numbers are Census counts or constant exponential extrapolations. Excess demand was examined using original survey data of employers of pharmacists collected for the PMP.

**Principal Findings:** The 1991 ratio of active licensed pharmacists to 100,000 population was 68 for the US and among regions: Northeast (73), Midwest (71), South (70), and West (57). The annual average number of graduates per 1,000,000 population over the ten years, 1990-1999, was 28 for the US and Northeast (38), Midwest (32), South (26), and West (18). The 1998 employed pharmacists per 100,000 (1998) was 68 for the US varying from Northeast (71), Midwest (80), South (67), and West (57). Finally, excess demand, with 5 being the highest, has varied nationally from 4.11 to 4.43 over the past two years, and has been highest in the West and lowest in the Northeast.

**Conclusions:** There is considerable regional variation in the supply of pharmacists across regions, with greater variations among states (data not shown). The West had the lowest number of pharmacists in 1991, the lowest production of new graduates relative to the population during the 1990s, and was associated with the highest level of excess demand. Given the current shortage of pharmacists, it is important to understand differences as well as dynamics in supply and demand across states and regions in the US. Further research is necessary to better estimate migration and the response of supply to changes in demand.

**Implications for Policy, Delivery or Practice:** State and regional policies for pharmacist education and labor.

**Primary Funding Source:** HRSA, Illinois Regional Health Workforce Center

## Invited Papers

### *Work Environments Matter: Nurse, Physician & Patient Satisfaction*

*Chair: Linda Aiken, Ph.D., R.N.*

Tuesday, June 25 ● 9:30 a.m. – 11:00 a.m.

● **Panelists:** Adalsteinn Brown, Lawton Robert Burns, Ph.D., M.B.A., Sean Clarke, Ph.D., Kevin Grumbach, M.D. (*no abstracts provided*)

## Related Posters

### *Poster Session C*

Tuesday, June 25 ● 8:00 a.m. – 9:15 a.m.

● **Development of a Scale for Assessing Research-based Practice in B.S.N.**

Kathleen Barta, EdD, RN, Alison Levene, MLS, M.S., George Denny, Ph.D.

**Presented by:** Kathleen Barta, EdD, RN, Associate Professor, Nursing, University of Arkansas, 217 Ozark Hall, Fayetteville, AR 72701; Tel: 501-575-5871; Fax: 501-575-3218; E-mail: kbarta@uark.edu

**Research Objective:** The purpose of the study was to develop a scale for assessing the level of research-based practice in nursing.

**Study Design:** The study involved interviews with graduates of BSN programs who had been in practice less than two years. The main focus of the interviews was to identify challenging situations and impediments in practice when skills related to the researcher role are most needed (Bandura, 1997). Information from the interviews was used in the development of statements for the scale.

**Population Studied:** The target population of baccalaureate nurses had graduated in the last two years. The sample included responses from 59 graduates of three different B.S.N. programs

**Principal Findings:** The instrument contained 31 statements scored using a seven-point Likert-type scale. Factor analysis of the items resulted in four principal components that the researchers labeled as: keeps current with research in nursing practice, has comfort in using research, uses information sources, and exercises research leadership in the workplace. The total instrument had a Cronbach's coefficient alpha of .89.

**Conclusions:** A valid and reliable measure of research-based practice in BSN graduates was developed.

**Implications for Policy, Delivery or Practice:** The instrument would be useful for program evaluation to track the changes in graduates as they begin their practice in various settings.

**Primary Funding Source:** Foundations, University of Arkansas

## ● Occupational Stress, Strain and Coping for Healthcare

### Workers Across Four Diverse Settings

Karen Cox, R.N., Ph.D. ©, Susan R. Santos, R.N., Ph.D., Susan Teasley, R.N., Cathy Carroll, Ph.D., Stephen D. Simon, Ph.D.

**Presented by:** Karen Cox, R.N., Ph.D. ©, Vice President Patient Care Services, Patient Care Services, Children's Mercy Hospitals and Clinics, 2401 Gillham Road, Kansas City, MO 64108; Tel: (816) 234-3872; Fax: (816) 346-1333; E-mail: kcox@cmh.edu

**Research Objective:** The purpose of this study was to describe stress, strain and coping for inpatient care providers across four diverse healthcare settings. The long-range goal is to create a framework to test interventions across settings to improve the work environment for staff.

**Study Design:** This study used a mixed-methods approach. The Occupational Stress Inventory (OSI-R), that measures the three domains of occupational adjustment (stress, strain and coping) is 140-item Likert scale instrument. Subsumed within the instrument are 14 subscales. The OSI-R data were analyzed and the most problematic subscales identified. Focus groups were used to provide context and clarification for the OSI-R results and were conducted until data saturation was obtained.

**Population Studied:** Direct caregivers were sampled across four diverse inpatient types to include urban, rural, suburban and a tertiary pediatric settings.

**Principal Findings:** Sample size: 664 RNs and 354 Allied Health workers

Focus groups held: 25 with 100 participants

Principal findings:

- 1) The top three stress subscales identified by nurses were: physical environment, responsibility and role overload.
- 2) Baby Boomer nurses have significantly worse stress, strain and coping scores than other age cohorts.
- 3) There is congruence between nurses and allied health staff as to key sources of stress.
- 4) Focus group themes revealed congruence across settings - they are: worker "speed-up" due to increased unit activity, decreased manager support and increased emphasis on "customer service" when resources are being reduced.

**Conclusions:** This study mirrors the larger reports by Dr. Linda Aiken and colleagues on issues nurse believe interfere with the provision of care. This study adds an additional layer of analysis by identifying and clarifying the most problematic roles associated with the work context of the healthcare employee. These results will lead to interventions that can be empirically tested in future research.

**Implications for Policy, Delivery or Practice:** Leaders lean heavily on research to find "best practices" in healthcare administration. Policy makers must insist on data driven research that continues to monitor both subtle and large-scale changes for workers. The healthcare industry continues to struggle with fiscal constraints brought on by multiple influences. It is therefore imperative to develop and sustain programs that meet measurable outcomes in the areas of human services research and worker health.

**Primary Funding Source:** RWJF

## ● Characteristics of Internationally-Educated Nurses in the United States Workforce

Catherine R. Davis, PhD, RN, Richard Freeman, Ph.D.

**Presented by:** Catherine R. Davis, PhD, RN, Director of Research and Evaluation, Research and Evaluation, Commission on Graduates of Foreign Nursing Schools, 3600 Market Street, Suite 400, Philadelphia, PA 19104; Tel: (215) 222-8454; Fax: (215) 622-0425; E-mail: crdavis@cgfns.org

**Research Objective:** Identify qualitative and quantitative data on internationally-educated nurses in the US workforce that can be used by healthcare providers in workforce planning. Identify transitional

challenges for international nurses seeking employment in the US workforce.

**Study Design:** A 76 question telephone survey, based on the National Sample Survey of Registered Nurses conducted every four years by the Division of Nursing of the US Department of Health and Human Services, was constructed to identify the characteristics of foreign nurse graduates employed in US healthcare settings. The questionnaire was developed to identify international nurse graduate demographics as well as patterns in migration, residence, education, licensure and employment. The results were then compared to the findings of the National Sample Survey for Registered Nurses.

**Population Studied:** Graduates of international nursing programs who sat for the US licensure examination, the NCLEX-RN, between 1997 and 1999. The survey included 461 US licensed nurses and 328 nurses who had not achieved US licensure.

**Principal Findings:** Analysis of data finds that the majority of international nurses were educated in the Philippines and Canada, primarily in baccalaureate and diploma programs. They worked for some time in their home countries before emigrating and continue to hold licensure in their home countries. In the United States, international nurses worked predominantly in hospital settings as staff nurses in adult health nursing and critical care. Most spoke at least one language other than English, with 15% using a second language in their nursing practice. The overwhelming majority indicated that they were moderately or extremely satisfied working as nurses in the United States. Immigration, licensure and employment issues were the most frequently identified challenges when transitioning to nursing practice in a host country. When the data was compared to the findings of the National Sample Survey, international nurses were younger than, more culturally diverse, and more likely to hold a baccalaureate degree in nursing than their US-born counterparts.

**Conclusions:** The analysis suggests that internationally educated nurses play a vital role in the US healthcare system. They are in the forefront of patient care and are well positioned to provide culturally competent care to a diverse US population. Assimilation into the US workforce presented both challenges and opportunities for the international nurse graduate. The outcomes of this study raised the need for further research on the international nursing population in the United States from the perspective of the nurse, the employer, other healthcare personnel, and most importantly, the patient.

**Implications for Policy, Delivery or Practice:** Nurse staffing and assimilation of international nurse graduates into the US healthcare system.

**Primary Funding Source:** Commission on Graduates of Foreign Nursing Schools

## ● Understanding the Supply and Demand of MPH Health Educators

Leonard Finocchio, Dr.P.H., Mary Beth Love, Ph.D., Emma Sanchez, M.P.H.

**Presented by:** Leonard Finocchio, Dr.P.H., Principal Policy Associate, Children Now, 1212 Broadway, Oakland, CA 94612; Tel: 510.763.2444 x 136; E-mail: lfinocchio@childrennow.org

**Research Objective:** To estimate the supply and demand of MPH health educators in the San Francisco Bay Area and to extrapolate figures to estimate national figures.

**Study Design:** Time series panel survey of employers between 1995 and 1999 in the San Francisco Bay Area. Respondents were surveyed regarding MPH health educators on staff, hiring projections and importance of selected competencies.

**Population Studied:** Representative sample of employers of MPH health educators included hospitals, HMOs, national health associations, educational institutions, county health departments and community-based organizations.

**Principal Findings:** Extrapolating from local results, we estimate that there were four MPH health educators per 100,000 persons, or

12,000 employed nationally in 1999. The majority worked in local health departments and community-based organizations. Hiring in the late 1990s was largely replacement, although employers anticipated hiring increases between 2000 and 2004. Employers reported that overall educational preparation was adequate, although preparation in specific competencies, such as bilingual competence, was lacking.

**Conclusions:** These analyses suggest a favorable labor market for MPH health educators in the immediate future.

**Implications for Policy, Delivery or Practice:** Accredited graduate health education programs could modestly increase enrollment capacity, while making specific curricular and internship modifications.

**Primary Funding Source:** San Francisco State University

### ● Incomes of New Physicians Entering Clinical Practice by Specialty, 2000-2001

Paul Wing, DEngin, Gaetano Forte, B.A., Joseph Nolan, M.S., Edward Salsberg, M.P.A., Mark Beaulieu, B.S., Gaetano J. Forte, B.A.

**Presented by:** Gaetano Forte, B.A., Program Research Specialist III, Center for Health Workforce Studies, School of Public Health, University at Albany, State University of New York, 1 University Place, Suite 200, Rensselaer, NY 12144; Tel: (518)402-0250; Fax: (518)402-0252; E-mail: gjf01@health.state.ny.us

**Research Objective:** To estimate the first-year incomes of new physicians by specialty, controlling for other factors significant in describing variations in starting income.

**Study Design:** An annual survey of all physicians completing a residency or fellowship training program in New York State between 2000 and 2001. The survey is conducted in collaboration with the teaching hospitals in the state. The questionnaire, completed by each individual resident, collects extensive information on their demographic and educational background, their post-training plans and their perceptions of the job market for new physicians. Over 2,800 residents and fellows completed the survey in 2000 (65% response rate), and more than 2,800 completed the survey in 2001 (65% response rate). A general linear model was used to estimate total income levels for a number of specialties reported by survey respondents adjusted for possible effects of several factors significant in describing variation in starting income.

**Population Studied:** All residents and fellows completing a residency training program in New York State who reported having confirmed practice plans upon completion of their training in 2000 and 2001.

**Principal Findings:** The total starting incomes (base salary plus incentives) of over 2,330 physicians entering clinical practice after residency training varied by as much as two to one across the specialties considered. The income of primary care physicians was well below specialist incomes. Starting incomes were particularly high for some specialties, like radiology, orthopedic surgery, emergency medicine, and anesthesiology. Total starting incomes varied significantly by specialty, citizenship status, gender, and number of hours spent in patient care per week.

**Conclusions:** There are a number of important factors that affect starting incomes of physicians. The findings of this study suggest that specialty is one of the most influential factors affecting starting incomes.

**Implications for Policy, Delivery or Practice:** National policies designed to reduce physician supply and to increase the ratio of primary care to non-primary care physicians appear to run counter to the current marketplace dynamics. While certainly reflective of the unequal reimbursement for primary and non-primary care services, the disparity in incomes between primary care and non-primary care physicians suggests that demand for primary care physicians is lower than that for non-primary care physicians. Understanding the complex relationship between physician demand, income, and incentives to enter particular specialties is critical in developing

policies that are most likely to ensure that appropriate care is available to those who need it.

**Primary Funding Source:** HRSA

### ● Spirituality Among Exemplary Compassionate Clinicians Working in Hospitals

David Graber, M.P.H., Ph.D., Maralynne Mitcham, Ph.D., Albert Keller, B.D., S.T.M.

**Presented by:** David Graber, M.P.H., Ph.D., Associate Professor, Health Administration and Policy, Medical University of South Carolina, 19 Hagood Avenue; Suite 408 - Harborview Tower, Charleston, SC 29412; Tel: (843) 792-9218; Fax: (843) 792-3327; E-mail: graberd@musc.edu

**Research Objective:** To compare the personal spirituality of clinicians identified as exemplary in caring and compassion to a national sample of Americans.

**Study Design:** Clinicians at two Charleston hospitals were identified by administrative and clinical managers as being exemplary in caring and compassion. 24 were interviewed and completed two spirituality scales developed by a Fetzer Foundation/NIA Task Group.

The two scales are "Daily Spiritual Experiences" and "Meaning." These scales were administered to a sub-sample of individuals as part of the 1998 General Social Survey (GSS). Scale results were compared between the clinician group and the GSS subsample. Methods included the Chi-Square Test for Trend and the Mann-Whitney Test.

**Population Studied:** 24 clinicians working in Charleston hospitals. Clinicians included nurses, physicians, therapists, and other health care practitioners. Comparison group consisted of individuals completing two spirituality scales on the 1998 General Social Survey (n=1,445).

**Principal Findings:** Our analysis identified several important differences between the GSS participants and the 24 clinicians identified as being exemplary in caring and compassion. However, both the clinicians and a considerable proportion of the national sample indicated that spirituality is highly important in their lives. Findings provide useful information on: how individuals find meaning and fulfillment in life, their expressed feelings of connection with God or a higher power, the degree of strength or comfort they find in their religion or spirituality, and other important dimensions of spirituality.

**Conclusions:** Caring and compassionate clinicians in our sample find great personal meaning and fulfillment in their work. Typically, they feel considerable closeness to God and a higher power. Virtually all of the clinicians indicated that they enjoy their work in spite of considerable job demands. In fact, their spirituality or religion helps them to cope with difficulties and stresses in their work.

**Implications for Policy, Delivery or Practice:** This study affirmed that spirituality, which has been largely unexamined in health care research, provides meaning and is a critical motivating factor among the most caring health care clinicians. Study results from the interviews and scales identified several common traits or perspectives among the caring clinicians. Results will serve as the foundation for continuing education programs in health care facilities that seek to provide compassionate care.

**Primary Funding Source:** Foundations, Fetzer Foundation

### ● An Analysis of the Health and Productivity Cost Burden of Physical and Mental Health Conditions Affecting Six Large Corporations in 1999

Kevin Hawkins, Ph.D., Ron Goetzel, Ph.D., Ron Ozminkowski, Ph.D.

**Presented by:** Kevin Hawkins, Ph.D., Senior Economist, Outcomes Research & Econometrics, The MEDSTAT Group, 777 E Eisenhower Pkwy, Ann Arbor, MI 48108; Tel: (734) 913-3145; Fax: (734) 913-3200; E-mail: kevin.hawkins@medstat.com

**Research Objective:** To estimate the most costly health and disease conditions affecting medical, absenteeism, short term disability, and workers' compensation expenditures.

**Study Design:** The MEDSTAT Episode Grouping software product was used to classify and organize inpatient, outpatient, and pharmaceutical claims temporally, so they were all connected to the treatment of any given health condition. Absence and short term disability claims also associated with that particular clinical episode were then combined. Because a large portion of workers' compensation data were either missing or missing diagnosis codes, health related episodes of care involving these claims were analyzed separately. The most costly physical and mental health conditions were then ranked by their overall combined medical, pharmacy, absence and short term disability expenditures.

**Population Studied:** The MEDSTAT Group's Health and Productivity Management Database, composed of medical, pharmacy, short term disability, absence, and workers compensation claims for 340,000 employees and their dependants over a 3 year period was utilized.

**Principal Findings:** Across all physical health conditions, employers paid an average of \$1,848 per eligible employee for group health, 53% of total, \$399 per employee for short term disability, 11% of total, and \$1,254 per employee in absence, 36% of total. When considering per eligible payments for mental health conditions, \$68, 39% of total HPM payments, was paid through group health benefits, \$28, 16% of total, was paid through short term disability programs, and \$80, 45% of total, was as a result of employee absence from work.

**Conclusions:** An analysis of the cost burden of physical and mental health conditions affecting American businesses revealed that about half of all expenditures are attributable to the company's group health experience, while the balance is due to costs associated with worker absence and short term disability associated with a specific disease or condition.

**Implications for Policy, Delivery or Practice:** The results imply that corporate health and productivity management interventions should be evaluated in terms of their impact on both medical and productivity related outcomes.

**Primary Funding Source:** Foundations, Eli Lilly and Company

### ● Factors Affecting Cognitive Function in Acute Care Nurses Working 12 Hour Shifts

Margaret Hodge, EdD

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**Research Objective:** Twelve hour work shifts are increasingly common in health care and preferred by many nurses despite the aging of the nursing workforce. The primary purpose of this pilot study was to systematically investigate whether significant changes in cognitive function occurred while working a 12-hour shift. Specifically the study examined the effect that shift duration, age, fatigue and total number of hours worked had on nurse's reaction times and accuracy?

**Study Design:** Repeated measures of fatigue and cognitive function were obtained within the first hour, after seven to eight hours, and at the end of the first and last days of a series of work shifts. Data was also collected on the number of consecutive days worked, amount of overtime, and quality of the previous night's sleep. Measures of cognitive function included: Simple Reaction Time, Accuracy and Reaction time for Digit Vigilance, Choice Reaction Time and Accuracy, Spatial Memory Reaction Time and Accuracy, as well as Logical Reasoning Reaction Time and Accuracy.

**Population Studied:** A convenience sample of thirty, full-time acute care nurses, working 12-hour shifts for their primary employer were recruited. There were no exclusion criteria.

**Principal Findings:** Results of this study were mixed. Participants demonstrated no significant differences for either time of day or day of week, in a measure of simple reaction time. Although in nurses over 45 years of age, there was an increase in simple reaction time as sleep disturbances increased. No differences were found in nurses less than 45 years of age. Digit Vigilance, a measure of attention, decreased significantly ( $p < .05$ ) throughout the 12 hour shift. Significant inverse relationships between speed of spatial working memory and age, fatigue, and general sleep disturbances were found. For spatial working memory reaction time, participants scored significantly better on Day 1 than on Day 2 ( $p < .05$ ) with an average 8% decrease in reaction time by the 2nd day. Conversely, in a measure of logical reasoning, participants demonstrated significantly faster reaction times in the evening with the fastest scores noted at the end of Day 2. Although over time, reaction times improved for logical reasoning, accuracy decreased as fatigue levels increased ( $p < .05$ ).

**Conclusions:** Increasing age and fatigue are significantly associated with decreased reaction times and accuracy, particularly for attention and memory. These very preliminary findings indicate a need to assess and compare the impact of age and fatigue over time in a larger sample and with other shift patterns.

**Implications for Policy, Delivery or Practice:** Quality of care and work scheduling.

### ● Measuring Clinical Nursing Expertise for Outcomes Research Eileen Lake, PhD, RN, MPP

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**Research Objective:** To develop a valid, reliable survey measure of clinical nursing expertise that can be used in hospital outcomes studies to show that nursing expertise is important to the quality of care and patient outcomes and to identify work environments that cultivate nurses' expertise.

**Study Design:** A multi-item instrument comprising 35 nursing roles or functions was developed from Benner's From Novice to Expert (1984). For each item, respondents reported their level of ability using a five-point scale. Sample items were "Establishing trust and good communication with patients and families," "Creating and implementing wound care strategies that foster healing and comfort," and "Setting priorities to effectively coordinate and meet multiple patient needs and requests." Based on a pretest by 95 staff nurses, item wording and sequence were refined based on pretest data analyses. The instrument was tested for reliability and validity in a purposive sample of 83 staff nurses. The three sources of assessment of clinical nursing expertise were the nurse respondents themselves ( $n = 62$ , 75% response rate), a clinical director and advanced practice nurse responsible for the nurse's clinical area, and three nurse colleagues that each nurse respondent identified as "knowing my nursing practice well" ( $n = 128$  different colleagues who conducted 186 different survey assessments, 72% response rate). A scale created from all 35 items was assessed for internal consistency using Cronbach's alpha. The scale's construct validity was evaluated using the clinical director's and colleagues' views of the respondent's expertise. Concurrent validity was evaluated using seven indicators of clinical advancement and professional activity.

**Population Studied:** Sixty-two staff nurses from all clinical areas and levels of care in a teaching hospital provided self-assessments of clinical expertise. In addition, for each staff nurse in the study a clinical director and advanced practice nurse in their clinical area rated the nurse's level of expertise and from one to three of their nurse colleagues provided detailed assessments.

**Principal Findings:** The multi-item instrument was highly reliable ( $\alpha = .97$ ). The instrument's hypothetical range of 1 (beginning level of expertise) to 5 (highest level of expertise) suggests that the mean score of 4.1 for this sample corresponds to a "proficient" level of expertise. Construct and concurrent validity of the expertise instrument were supported by strong (ranging from .69 to .81) and statistically significant correlations between the nurse's scale score and the director's and peers' assessments, as well as other validity indicators.

**Conclusions:** The new survey measure shows promise for use in research on clinical expertise and its association with the quality of patient care and patient outcomes.

**Implications for Policy, Delivery or Practice:** A growing body of literature shows that nurse staffing levels are important to patient outcomes. The focus on numbers of nurses, however, can obscure what may be a key component of the nurse staffing dimension that has yet to be factored into outcomes research: clinical nursing expertise. Expertise may be the single, most powerful influence on the technical quality of nurses' clinical interventions. Moreover, expertise is critical to nurses' non-clinical functions, such as coordination within a therapeutic team of providers. This new survey measure provides the basis for including nursing expertise in studies linking hospital nursing organization to patient outcomes.

**Primary Funding Source:** Government, NINR

### ● A Simulation Model of Nursing and Physician Workforce Projections

Mary Logan, Ph.D.

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**Research Objective:** Although several national nursing workforce models exist, such as the Bureau of Health Professions Nursing Supply Model, and many specific details are known about hospitals, physicians, nurses, and financial management of the system, an systems-based overview of the relationships between these variables is needed. The goal of this model was to simulate health care work force dynamics in order to provide a better understanding of the relationships between the physician and nursing work forces and the current health care industry, and to simulate the impact of the introduction of managed care.

**Study Design:** In this study, an aggregated simulation model of national health care was developed and calibrated with data from the year 1992. The model connected 5 sectors: patients, nurses, physicians, hospitals, and the insurance industry. The model simulated the growth of physician and nurse work forces since 1970, identified factors affecting their growth, and projected workforce supply through 2017. Computer simulations were made in order to examine the introduction of managed care, and to consider alternative policy options for the future. A conceptual framework using the ecological theories of pulsation, self-organization, and competition were used to support this study. The model was calibrated with 1992 data and was implemented using the computer software program Stella. The model was then used to explore different scenarios, including the introduction of capitation in the form of payment by number of patients rather than by treatments, epidemics, and policies for physician growth reduction.

**Population Studied:** The model was calibrated to 1970-1992 data from multiple sources at a national scale.

**Principal Findings:** A baseline simulation generated supply curves that matched observed data within 1.2% for nurses and 2.3% for physicians. Hospitals' resources trended downward, while all other main variables continued a pattern of growth. The most prominent result of capitation over the long term was the growth of insurance capital and profits. The positioning of the insurance industry relative to incoming resources allowed it to siphon profits, but also created

vulnerability to multiple factors. Capitation did not affect physician and nursing supply as long as federal subsidies were not altered, and did not affect treatment rates substantially until most of the system was shifted from fee-for-service to a capitated payment mechanism. Nor did capitation create the expected decrease in rates of health care inflation that were expected.

**Conclusions:** In this model, fluctuations in national unemployment levels appeared to affect nursing workforce supply less than relative nursing wage fluctuations did. The intrusion of additional foreign medical graduates and the longevity of physicians' training and careers contributed to the relative overgrowth of physician supply. The insurance industry benefited the most from capitation in this model, while hospitals benefit the least. Hospital resources in general were found to decline the most of entities in this model. Managed care capitation did not control health care inflation as was expected.

**Implications for Policy, Delivery or Practice:** The model suggests many strategies for policy changes to stabilize growth and to reform the market.

### ● A prospective investigation of the impact of smoking bans on tobacco cessation and relapse

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**Research Objective:** To determine the long-term impact of workplace smoking bans on employee smoking behavior. Main outcome variables are the post-ban quit ratio and relapse rate.

**Study Design:** The design of this natural experiment is a prospective cohort study. This is a national longitudinal study in which employees in workplaces with a total smoking ban and a community comparison group were followed to identify changes in smoking behavior. Between group comparisons were conducted using the Cochran-Mantel-Haenszel statistic for general association, stratified Cox proportional hazards models, and the CMH analysis of variance statistic based on ranks. McNemar's test and the sign test were used to test for changes over time within each group.

**Population Studied:** Over three years we studied a total of 1,033 current or former smokers (intervention group) employed in smoke-free hospitals and 816 current or former smokers (comparison group) employed in non-smoke-free workplaces. We randomly selected both hospitals and employees from 12 strata based on hospital size and state tobacco regulations, and sampled employees in the same communities.

**Principal Findings:** Differences in the post-ban quit ratio were observed between intervention and comparison groups ( $P < 0.02$ ). For employees whose bans were implemented at least seven years prior to survey, the post-ban quit ratio was estimated at 0.256, compared with 0.142 for employees in non-smoke-free workplaces ( $P = 0.02$ ). After controlling for a variety of factors, time to quit smoking was shorter for the hospital employees ( $P < 0.001$ ), with an overall relative risk of quitting of 2.3. Contrary to expectations, relapse rates were similar between the groups.

**Conclusions:** Employees in workplaces with smoking bans have higher rates of smoking cessation than employees where smoking is permitted, but relapse is similar between these two groups of employees. Compared with employees of workplaces where smoking was allowed, more employees of hospitals with smoking bans quit smoking. Time to quit smoking was shorter for hospital employees as well. Relapse rates were similar between the two groups. While smoking bans are designed to protect non-smokers from the ill effects of smoking these policies have additional health benefits.

**Implications for Policy, Delivery or Practice:** The results of this investigation have international applicability for policy makers, clinicians, employers and employees. Workplace smoking bans provide another opportunity to encourage smoking cessation and should be considered in the arsenal of strategies to reduce and prevent smoking among adults. Countries should review smoking policies in workplaces in light of their own smoking patterns and efforts to deal with ETS.

**Primary Funding Source:** RWJF

● **Productivity Incentives and the Non-Physician Clinical Workforce**

Glen Mays, Ph.D., M.P.H.

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**Research Objective:** The confluence of rising practice expenses and growing staffing shortages has led medical care providers to consider a variety of strategies for improving operational efficiency. One strategy has been the expanded use of non-physician clinicians, and another has been the adoption of clinical compensation systems tied to productivity. This paper examines how productivity incentives influence the labor supply responses, productivity, and earnings of a key segment of the non-physician clinical workforce: physician assistants (PAs).

**Study Design:** This analysis uses generalized estimating equations to model the effects of productivity incentives on patient encounters, hours worked, and earnings by a national panel of PAs, while controlling for characteristics of the practice settings and labor markets in which PAs work. Instrumental variables methods are used to control for the endogenous selection of PAs into settings that offer productivity incentives. The models use data from the American Academy of Physician Assistants' Physician Assistant Census, an annual census survey of licensed PAs in the US, linked with county-level data from the Area Resource File.

**Population Studied:** Licensed PAs employed full time by physician practices and medical groups in 1997, 1998, and 1999. Observations from 8,714 individuals and 14,428 person-years were used.

**Principal Findings:** PAs with higher levels of formal clinical education and more years of clinical experience were more likely to receive productivity incentives. After controlling for this selection, productivity incentives were associated with an 18% increase in patient encounters, a 10% increase in hours worked, and a 12% increase in earnings per hour. Productivity incentives did not appear to affect patient encounters per hour after controlling for the selection of PAs into jobs with productivity incentives.

**Conclusions:** Results suggest that productivity incentives encourage clinicians to increase clinical output by working longer hours, rather than by seeing more patients per hour. Furthermore, findings are consistent with the hypothesis that productivity incentives attract clinicians with higher skill levels and more efficient practice patterns.

**Implications for Policy, Delivery or Practice:** Medical care organizations may find it possible to expand clinical capacity by introducing productivity incentives for non-physician clinicians. Because these expansions are likely to be achieved through increases in clinician work hours, providers and policymakers should not overlook the possibility that such incentives could have adverse effects on job satisfaction, workforce retention, and quality of care.

**Primary Funding Source:** UNC-Chapel Hill School of Public Health

● **Assessing the Efficacy of a Nursing Assistant Workforce Improvement Intervention in Long-term Care Settings**

Thomas R. Konrad, Ph.D., Jennifer Craft Morgan, MA

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**Research Objective:** The WIN A STEP UP project's goal was to launch and evaluate an intervention aimed at improving retention and job satisfaction for the nursing assistants enrolled as participants. This pilot intervention offered training in nursing skills and psychosocial issues and compensation for training and the successful completion of retention contracts. This paper evaluates the intervention using both qualitative and quantitative methods.

**Study Design:** Data were collected from the nursing assistant workforce of eight participating and twenty-one matched comparison long-term care organizations. Non-participating nursing assistants (N=190) at participating and comparison sites were matched to participants (N=77) using propensity scores. Propensity scores were calculated as predicted probabilities from a logistic regression model using baseline measures of working conditions, extrinsic rewards, region and organizational type to predict selection into participation. Measures of job satisfaction, career commitment and actual turnover were collected from both participants and matched controls before and after the intervention (N=199). In addition, participants were asked to subjectively evaluate the efficacy of the intervention. T-tests, chi-square analyses and correlations were used to assess before-after changes as appropriate.

**Population Studied:** Nursing assistants working in long-term care organizations in North Carolina, specifically enrolled participants (N=77) and matched controls (N=190).

**Principal Findings:** Our analyses indicate that the intervention was a success. Success was defined in terms of four outcomes: increased career commitment, increased job satisfaction, turnover and nursing assistants' subjective evaluations of the intervention project. Approximately 75% of participants reported that participation in the project increased their chances of remaining as an employee in their organization. In open response data, participants report feeling that the program increased their skills, renewed old skills, and increased their confidence. After the training, they felt more competent and more dedicated to the job. In quantitative analyses, results of bivariate analyses indicated that both matched LTC organizations and matched nursing assistants were similar at baseline. In before-after analyses, participants were more likely to increase in job satisfaction whereas matched controls were more likely to decrease in job satisfaction over the period. In nursing homes (17 of the 29 target facilities), this association between participation and increases in job satisfaction was statistically significant. Results for career commitment follow the same pattern. In terms of turnover, fewer participants quit their jobs than matched controls (15% vs. 20%), however, this difference was not statistically significant.

**Conclusions:** The intervention strategies employed, under the auspices of the WIN A STEP UP program, were successful. Trends in overall data suggest that interventions linking training and compensation may work in all LTC settings. The lack of statistical significance, in some cases, may be due to the small sample size of enrolled participants. These findings are strengthened by qualitative data that suggested the intervention was an unmitigated success across setting.

**Implications for Policy, Delivery or Practice:** Workforce initiatives involving training linked to compensation may be useful in stabilizing the workforce.

**Primary Funding Source:** NRSA Pre-Doctoral Fellowship and Kate B. Reynolds Charitable Trust

● **Physicians Working Part-Time: Implications for the Workforce and the Workplace**

Holly Mulvey, M.A., Phyllis R. Kopriva, B.A., William L. Cull, Ph.D.

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**Research Objective:** To collect multi-specialty, gender-specific data pertaining to part-time employment and to compare the experiences of pediatrics with other specialties.

**Study Design:** As part of the new AMA Patient Care Physician Survey, information was collected pertaining to part-time employment, direct patient care hours, and physician demographics. A total of 8100 non-federal, patient care physicians from all physician specialties were sampled from the AMA Masterfile and surveyed. Following an initial mailing, a reminder letter, and a second mailing, 1593 responses (20%) have been received to this point.

**Population Studied:** Responses from pediatricians, which represent approximately 10% of respondents, were compared to those of respondents in all other specialties. The pediatrician group included general pediatricians and pediatric subspecialists. Overall, the gender of the respondents was 64% male and 36% female.

**Principal Findings:** Pediatricians were more likely than nonpediatricians to report that they have or are currently working part time (28% versus 21%,  $p = .042$ ). This finding is associated with a high percentage of pediatricians who are female (45%) and with the greater likelihood that female rather than male physicians work part-time (28% versus 19%,  $p < .001$ ). No difference was apparent between pediatricians and nonpediatricians in the number of hours thought to generally define part-time work in their specialty ( $p = .153$ ). Across all specialties, those working part-time provided 20 direct patient care hours fewer on average than those working full-time (mean hours/week: 28 versus 48,  $p < .001$ ). No differences were apparent between the direct patient care hours provided by men and women within the full-time ( $p = .113$ ) or part-time ( $p = .611$ ) groupings.

**Conclusions:** Women physicians are more likely than their male counterparts to work part-time. This is of particular importance to specialties such as pediatrics that have higher percentages of female physicians. For all specialties, if part-time status is controlled for, there are no significant differences in patient care hours worked between male and female physicians.

**Implications for Policy, Delivery or Practice:** Over the past several decades, the number of women entering the physician workforce, especially but not exclusively in pediatrics, has been significant. Issues such as the availability of part-time employment, the feasibility of job sharing, benefits, and the impact on practice are especially important for specialties well represented by females. For these specialties, researchers, policy makers, and employers may need to re-examine the forecasted supply of physicians relative to possible increased demand and changing employment preferences.

**Primary Funding Source:** American Medical Association and The Future of Pediatric Education II Project

● **Cross-Border Utilization of Health Care on the U.S.-Mexico Border**

Michael Parchman, M.D., M.P.H.

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**Research Objective:** Rapid industrialization and population growth stimulated by NAFTA has placed enormous strains upon the already-limited health services delivery systems along the US-Mexico border. A combination of factors creates extraordinary access to care problems along the border: poverty, lack of insurance, lack of bilingual providers and culturally insensitive health care systems. Current measures of access to care and adequate workforce supply are confounded by the proximity of Mexico and cross-border seeking of health care by residents on the border. Any studies of health professional workforce issues on the U.S.-Mexico border will be incomplete without an understanding of the dynamic health-seeking behaviors of the population living on the border. Estimates of demand, current supplies and future needs will be inaccurate if this phenomenon is not taken into account. The purpose of this study was to evaluate where low-income residents in the largest city on the US-Mexico border sought care, and what demographic characteristics were associated with seeking care in either the U.S. or Mexico. Specifically we hypothesize that those without health insurance and those with Spanish language preference are

1. More likely to seek care primary care from physicians in Mexico
2. More likely to obtain prescription and non-prescription medication in Mexico.
3. More likely to seek specialty care in Mexico

**Study Design:** A cross-sectional survey.

**Population Studied:** The survey was administered to a sample of individuals, age 18 and over who resided in El Paso, Texas. The individuals were selected from six different sites in El Paso, along the border with Mexico. Three of the sites were public, outdoor spaces, and three were community centers in established, predominately Mexican-American neighborhoods. Geographically, the sites chosen extended from the downtown plaza of El Paso, eastward along the Rio Grande to the suburb of Socorro, Texas. All surveys were administered in Spanish by one bilingual (English-Spanish) observer.

**Principal Findings:** A total of 77 surveys were completed. The key findings of this survey were: 1) Among those who had ever seen a primary care physician, 49.4% reported that they had seen a primary care physician in Juarez, Mexico at least once; and 2) Among those who had ever seen a specialist physician, 23.7% reported that they had seen a specialist in Mexico at least once. Patients with health insurance were 2.42 more likely to report that they had ever seen a primary care physician in Juarez compared to those without insurance. (95% C.I.=1.56, 3.74) Those whose language preference was only or mostly Spanish were 1.54 times more likely to report ever seeing a primary care physician in Juarez, compared to those who were bilingual or English only. (95% C.I.=1.14, 2.08)

Two-thirds reported that they had purchased medication at a pharmacy in Mexico, and of those, 82.7% reported that they had purchased prescription medication without a prescription. Patients without insurance were 1.78 times more likely to report that they had filled a prescription for medication in Juarez. (95% C.I.=1.07, 2.96) Language preference was not related to where patients had filled a prescription for a medication. Patients without health insurance were 1.69 times more likely to report that they had purchased a prescription medication in Juarez without a prescription. (95% C.I.=1.11, 2.56) Those who spoke only or mostly Spanish were 1.50 times more likely to report purchasing a prescription medication without a prescription.

**Conclusions:** All of the counties in Texas on the U.S.-Mexico border are designated as either whole-county or partial-county primary care shortage areas. However, these shortage area designations are partially based on provider to population ratios. The results of this study suggest that for those without health insurance, and for those whose language preference is Spanish, that pharmacists, and primary care providers in Mexico "fill-in" for the observed primary care provider shortage along the border. However, because the study only asked residents on the U.S. side of the border about their health-care seeking behaviors, it is possible that true demand for health care services is much higher than expected as a result of residents on the Mexico side of the border seeking care in the U.S. This study did not

ask about preferences concerning where border residents would like to receive their health care, and thus does not represent a true measure of demand for care. The study was also limited by its isolated geographic location, and its focus on low-income residents. **Implications for Policy, Delivery or Practice:** The results of this study may have important implications for health care workforce planning. In order to improve our understanding of this issue, more studies are needed on cross-border health care seeking behavior and preferences among residents on both sides of the border. The results of such a study will inform future health professional workforce studies concerning the demand for health care services along the U.S.-Mexico border.

### ● **Work Status Issues in Primary Care and Occupational Medicine Practice: Result of a Physician Survey**

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**Research Objective:** Prior investigations of how primary care physicians (PCP's) address work status of their patients have focused on disability claims, and have not addressed the larger scope of work-related issues that arise in primary care practice. This study was conducted to evaluate the extent of these practices and opportunities for improvement.

**Study Design:** Mailed survey of 423 actively practicing PCP's and 40 occupational medicine physicians (OMDs) selected from the database of the Massachusetts Board of Registration in Medicine. Response rate was 43% for PCP's and 70% for OMP's.

**Population Studied:** Occupational and primary care physicians in Massachusetts.

**Principal Findings:** On average, PCP's were asked to provide some information on work ability in 9% of all visits, primarily in non-work-related conditions. Decisions about work status were largely based on patient input and clinical observations. Direct communication with employers was rare, although this was a recognized need. Facilitating safe return to work and protecting patient confidentiality were endorsed by 93% and 82% of PCP's as important roles; only 6% stated that PCP's should not have a role in these issues. However, a quarter of PCP's believed that they had little influence over disability outcomes, a viewpoint not shared by OMP's. PCP's endorsed a number of patient-related, information and workplace barriers to effectively supporting return to work; OMP's also endorsed the workplace factors, but had significantly less concern about the patient-related and information factors.

**Conclusions:** Results suggest that disability issues are common and appropriate aspects of primary care practice. Difference between PCP's and OMP's responses may reflect differences in patient mix, conditions, and employer affiliation, as well as training and experience.

**Implications for Policy, Delivery or Practice:** Recommendations for improvement include PCP education, improved systems for communication with employers, and more access to alternative duty assignments.

**Primary Funding Source:** CDC, NIOSH

### ● **Assessing the Nurse Workforce in New Hampshire**

Michele Solloway, Ph.D., Shawn LaFrance, M.H.A., Kathy Bizarro, M.H.A.

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**Research Objective:** Conduct a comprehensive statewide assessment of the characteristics, working conditions, attitudes and experiences, compensation and demand for RNs and LPNs in New Hampshire **Study Design:** A stratified random mail survey of 2000 RNs/LPNs was conducted in the fall of 2001. A companion survey was sent to 500 nurses whose licenses had lapsed. A survey of hospital HR personnel was conducted to assess vacancies, turnover rates, recruitment and retention. (Data for these two surveys is being analyzed now.)

**Population Studied:** RNs and LPNs in New Hampshire.

**Principal Findings:** Nurses currently practicing in New Hampshire are, on average, 44.5 years old and have been practicing for 19 years. Nurses new to the profession represent only a small proportion of the workforce, while one-third have worked 25 years or more. Most were female RNs, with less than a Bachelor's degree, who worked full-time and earned less than \$40,000. Only about half received benefits; health insurance, flex-time, retirement and paid vacation were considered most important in terms of continuing nursing. More than one-third maintain licenses in other states, with the vast majority being in neighboring states. The majority reported that their education had prepared them for the workplace; nursing met their expectations; and they would recommend nursing as a career choice. Almost half had received professional recognition within the last year but reported getting more acknowledgement for the quality of their work from patients and co-workers. Most felt valued at work, but only about half were satisfied with their jobs. Paperwork, staff shortages, lack of respect and low pay were the most significant sources of stress and dissatisfaction. Nurses in long-term care facilities and nurses ages 40-49 reported significantly worse working conditions, lower salaries, and more job dissatisfaction. Trust between respondents and administrators, physicians, other nurses and paraprofessionals was generally split equally between being high and moderate but were significantly worse for nurses in long-term care facilities. These nurses were also significantly older, had worked longer and were closer to retirement. Regardless of practice setting or age, the three most important issues for continuing nursing were salary, helping patients, and the ability to make decisions regarding patient care. Least important were promotion opportunities, the working environment and flexibility to move among different nursing roles. Significant vacancy and turnover rates are reported by many hospitals in the state. Recruitment of new nurses has been difficult.

**Conclusions:** Nursing shortages in New Hampshire are significant and a major source of stress for provider organizations and nurses. Many have options to work in other states where salaries are higher. Working conditions, salaries, job satisfaction and professional recognition are worse in long-term care facilities compared to other settings. Salary is important but other factors, such as respect, flex-time, practice autonomy and shared clinical decision-making power may be more crucial in developing the nursing workforce.

**Implications for Policy, Delivery or Practice:** Nurse staffing, recruitment and retention policies and programs. State health care workforce policy.

**Primary Funding Source:** Foundations, NH DHHS, Community Grants Program

## ● The Effect of Hospital Mergers on Employment

Joanne Spetz, Ph.D., Jean Ann Seago, R.N., Ph.D., Shannon Mitchell, M.P.H., Ph.D.

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**Research Objective:** Many hospital mergers and system affiliations are opposed by community members and labor unions. One reason for this opposition is the belief that mergers are associated with reductions in employment. This study examines the effect of hospital mergers and system affiliations on staffing of nursing, management, and administrative personnel.

**Study Design:** A 12-year panel of data on hospitals in California is examined. Multivariate fixed-effects regressions are used to estimate the effect of mergers on employment of RNs, LVNs, aides, management/supervision personnel, and administration/clerical personnel, controlling for other hospital and market characteristics.

**Population Studied:** All non-Federal, non-Kaiser acute-care hospitals in California.

**Principal Findings:** Hospital mergers and system affiliations are associated with reduced staffing of RNs and increased staffing of aides, controlling for patient days. Conversely, hospitals that leave systems have higher staffing of RNs after the "spin-off". There is mixed evidence of reductions in administration/clerical personnel after merger.

**Conclusions:** Mergers are associated with reduced staffing of some types of personnel, and increased staffing of others. In general, the employment changes associated with mergers would decrease costs for the hospital.

**Implications for Policy, Delivery or Practice:** Mergers and system affiliations of hospitals may reduce employment for some groups of workers, particularly RNs and administration/clerical personnel. It is not surprising that these groups often oppose mergers. It is not clear if these changes in employment have detrimental (or beneficial) effects on patient care.

**Primary Funding Source:** Foundations, Public Policy Institute of California

## ● Data From Professional Society Placement Services as a Measure of the Employment Market for Health Professionals

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**Research Objective:** Extreme fluctuations in projections of surplus or shortage of health professionals make it especially important to know accurately the actual situation. However, surveys, the standard source of information, are so expensive they typically are undertaken only in crisis situations. We sought to ascertain whether data from a professional society placement service, a virtually cost-free information source, are valid and accurate measures of the employment market.

**Study Design:** We correlated three annual measures from the American College of Radiology's Professional Bureau placement service--(1) job listings, (2) jobseekers, and (3) job listings per jobseeker--with presumptively valid measures of the employment market. We used logarithmic data to measure elasticity--the percentage change in a placement service measure associated with each 1% change in the employment market.

**Population Studied:** Separately, diagnostic radiologists and radiation oncologists, with placement service data annually for 1990-2000 and comparison data for portions of this period.

**Principal Findings:** For diagnostic radiology, annual total jobs available, as ascertained by surveys, correlated 0.97 ( $p < 0.01$ ) with the ratio of radiologists' median income to all-physician median income (measured by other surveys), showing both of these presumptively valid measures of the employment market measure the same aspect of the market. The correlation of job listings, which measure demand, with total jobs, also a measure of demand, was 0.84 ( $p = 0.04$ ). The correlation with total jobs of (i) jobseekers, a measure of supply, and (ii) listings per jobseeker, which involves both supply and demand, was substantial, but less, 0.58 ( $p = 0.23$ ) and 0.76 ( $p = 0.08$ ), respectively. Correlation of the three placement service measures with relative income, which presumably depends upon both supply and demand, was 0.80 to 0.88 ( $p < 0.05$  for each measure). Listings changed approximately 1.9% and listings per jobseeker changed approximately 2.7% for each 1% change in total jobs. Graphed, all measures showed a softening of the job market in the first half of the decade with recovery in the second half.

For radiation oncology, placement service listings per job seeker correlated 0.895 ( $p = 0.04$ ) with a survey-derived index of training program directors' perceptions of the job market.

**Conclusions:** For diagnostic radiology, the significance levels of the correlations and the pattern of findings--namely, stronger correlations among measures of the same aspect of the employment market--indicate the placement service's data are valid and reasonably accurate measures of the employment market. They are sensitive indicators; they multiply underlying trends by a factor of 2 to 3, for reasons we explain. Radiation oncology provides an independent test of the placement service measures, albeit a test very limited in statistical power by the very few years for which comparison data are available. This test also indicates placement service data are good measures of the employment market.

**Implications for Policy, Delivery or Practice:** Those concerned about shortage or surplus of health professionals can accurately and validly track changes in the situation at negligible cost by using data from professional associations' placement services, thereby avoiding (i) the cost of surveys, which is usually unaffordable, and (ii) the lure of projections, which tend to be very volatile and not prove true.

**Primary Funding Source:** Foundations

## ● An Analysis of Hours Worked by Dentists: the Impact of Gender and Other Factors

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**Research Objective:** To describe the workforce participation of dentists between 1979 and 1999 and examine differences for men and women dentists. In addition, to assess the multivariate relationships of gender and other factors on hours worked by dentists.

**Study Design:** We conducted a retrospective analysis of national cross-sectional surveys from 1979 to 1999. We described overall workforce participation of dentists and differences in participation across men and women dentists in terms of reported weekly hours, part time status defined as less than 32 hours per week, and overtime status defined as more than 42 hours per week. We used multivariate regression and logistic regression to examine the impact of gender, age, marital status, having children, living in a metropolitan area, and survey year on average hours worked and part-time and overtime status. We also examined differences across men and women dentists in the impact of the independent variables on our measures of workforce participation.

**Population Studied:** Working Dentists were identified from a large (50,000 households per year) annual national Current Population Survey (CPS), Outgoing Rotations, from 1979-1999. Individuals self-reported their occupation as dentists from a detailed list of

occupational titles. Our total sample consisted of 4,209 men and 354 women dentists. Presence of children was only available in the years 1984-1993, where there was a sample of 2189 men and 159 women.

**Principal Findings:** Dentists overall in the sample worked an average of 40 hours, and hours declined slightly over time. The percentage of women was 2.7% in the 1979 sample and reached 14.9% in the 1999 sample. Women in the sample were younger than men (38 versus 45 years). Multivariate regression analyses found that controlling for other factors, Women dentists worked on average 4.8 fewer hours per week than men (p-value < .05). In the logistic regression models, gender was a significant predictor of working part time (women > men), and working over time (women < men). Age is another variable with statistical significance across the models. Younger dentists were less likely to work part time, and more likely to work overtime. Gender and age remained significant in models that included the presence of children. Regression analyses run separately for men and women showed effect differences across gender in that women with children worked substantially fewer hours and were more likely to work part time, while men with children had an increased likelihood of working overtime.

**Conclusions:** Our analysis suggests that the ongoing increase in the number of women dentists should be considered in dental workforce projections because gender has a significant relationship with hours worked. In addition, women's labor participation was impacted differently by marital status and presence of children. The survey is limited in that it does not contain other important practice information such as setting, patient populations, specialty, productivity, and earnings. Further study is warranted to examine other aspects of labor participation by women dentists.

**Implications for Policy, Delivery or Practice:** Workforce policy for Dentists.

**Primary Funding Source:** HRSA, Illinois Regional Health Workforce Center

### ● The Determinants of Physician Earnings

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**Research Objective:** To examine the effects of environmental challenges, perceived care management effectiveness, practice autonomy, compensation, and practice complexity are physicians' earnings.

**Study Design:** Cross-sectional analysis using data from 1996-1997 Community Tracking Study, a physician telephone survey conducted by the Gallup Organization. Data were mostly collected from physicians practicing in 60 randomly selected communities, allowing analyses to be conducted at both the national and community level.

**Population Studied:** A nationally representative sample of 12,385 direct patient care physicians in the United States. The survey response rate was 65%.

**Principal Findings:** Multivariate analyses demonstrate that environment challenges in terms of managed care turbulence positively influence the physicians' incomes (p<.05). Physicians practicing in an effective managerial environment, such as using clinical data and practice profiles for practice, are more likely to earn higher incomes than those others (p<.05). The findings also show that physicians with more practice autonomy are more likely than others to have higher incomes (p<.05). In a financial perspective, the findings indicate that physicians practicing under compensation or incentive plans are more likely than others to have better incomes (p<.05). The findings indicate that physicians practicing in more complex setting in terms of group practice are more likely to earn higher incomes than those in solo practice (p<.05). Over of all, the

explanatory power of the model is moderate (Adjusted R2 = 28.95) and significant at p<0.01.

**Conclusions:** The study concludes that environmental challenges, perceived care management effectiveness, practice autonomy, compensation and practice complexity influence physicians' earnings.

**Implications for Policy, Delivery or Practice:** The present study helps to identify important factors affecting physicians' incomes. From a practice perspective, probably the most useful conclusion to be drawn from this study is that physicians participating in managed care, having clinical autonomy and practicing group practices have earned more than their counterparts. From a policy point of view, physicians contracting higher Medicare managed care rather than Medicaid managed care are more likely to have higher incomes.