

Gender and Generational Influences on the Pediatric Workforce and Practice

abstract

In response to demographic and other trends that may affect the future of the field of pediatrics, the Federation of Pediatric Organizations formed 4 working groups to participate in a year's worth of research and discussion preliminary to a Visioning Summit focusing on pediatric practice, research, and training over the next 2 decades. This article, prepared by members of the Gender and Generations Working Group, summarizes findings relevant to the 2 broad categories of demographic trends represented in the name of the group and explores the interface of these trends with advances in technology and social media and the impact this is likely to have on the field of pediatrics. Available data suggest that the trends in the proportions of men and women entering pediatrics are similar to those over the past few decades and that changes in the overall ratio of men and women will not substantially affect pediatric practice. However, although women may be as likely to succeed in academic medicine and research, fewer women than men enter research, thereby potentially decreasing the number of pediatric researchers as the proportion of women increases. Complex generational differences affect both the workforce and interactions in the workplace. Differences between the 4 generational groups comprising the pediatric workforce are likely to result in an evolution of the role of the pediatrician, particularly as it relates to aspects of work-life balance and the use of technology and social media. *Pediatrics* 2014;133:1112–1121

AUTHORS: Nancy D. Spector, MD,^a William Cull, PhD,^b Stephen R. Daniels, MD, PhD,^c Joseph Gilhooly, MD,^d Judith Hall, MD,^e Ivor Horn, MD, MPH,^f Susan G. Marshall, MD,^g Daniel J. Schumacher, MD,^h Theodore C. Sectish, MD,ⁱ and Bonita F. Stanton, MD^j

^aDepartment of Pediatrics, Drexel University College of Medicine, Philadelphia, Pennsylvania; ^bDivision of Health Services Research, American Academy of Pediatrics, Washington, District of Columbia; ^cDepartment of Pediatrics, University of Colorado School of Medicine, Denver, Colorado; ^dDepartment of Pediatrics, Oregon Health and Science University, Portland, Oregon; ^eUniversity of British Columbia and British Columbia's Children's Hospital, Vancouver, British Columbia, Canada; ^fDepartment of Pediatrics, George Washington University School of Medicine and Health Sciences, Washington, District of Columbia; ^gDepartment of Pediatrics, University of Washington School of Medicine, Seattle, Washington; ^hMED Pediatric Emergency Medicine, Boston University School of Medicine, Boston, Massachusetts; ⁱDepartment of Medicine, Boston Children's Hospital and Department of Pediatrics, Harvard Medical School, Boston, Massachusetts; and ^jDepartment of Pediatrics, School of Medicine, Wayne State University, Detroit, Michigan

KEY WORDS

gender, generations, medical home, pediatric workforce

ABBREVIATIONS

ACGME—Accreditation Council for Graduate Medical Education
FOPO—Federation of Pediatric Organizations
NIH—National Institutes of Health

Drs Cull, Daniels, Marshall, Sectish, and Stanton assumed a primary focus on the gender-related questions; Drs Stanton and Cull gathered, analyzed, and interpreted some survey data; all 5 members of the gender subgroup conducted literature reviews, assessing the work of others on related topics, and interpreted the findings of this extant literature; Drs Spector, Gilhooly, and Hall were principally responsible for generational issues and collected, analyzed, and interpreted the extant literature and surveys on this topic; Drs Horn and Schumacher were responsible for contributing sections concerning the interface of technology and social media and generations; and all authors made substantial contributions to conception and design, acquisition of data and its analysis and interpretation, drafted initial sections and participated in multiple revisions, agreed to be accountable for all aspects of the work and related questions, and approved the final manuscript as submitted.

www.pediatrics.org/cgi/doi/10.1542/peds.2013-3016

doi:10.1542/peds.2013-3016

Accepted for publication Mar 14, 2014

Address correspondence to Bonita F. Stanton, MD, School of Medicine, Wayne State University, Scott Hall, Suite 1261, 540 East Canfield Street, Detroit, MI 48201. E-mail: bstanton@med.wayne.edu

(Continued on last page)

As a specialty with a primary focus on the health and well-being of the next generation, the pediatric community is committed to considering the implications of the emerging gender and generational trends in the workforce on pediatric practice and care. The pediatric community enjoys a long history of concern for its workforce.¹ In recent decades, an important focal point for this concern has been issues related to women in pediatrics.^{2,3} Although these issues have not yet been fully resolved, substantial progress has been made over the past several years. Of note, institutions across the nation have modified policies that had previously impeded the entrance or success of women in academic medicine. Increasing numbers of women have progressed to the academic rank of professor, and a higher proportion of leadership positions in schools of medicine and in the national pediatric groups constituting the Federation of Pediatric Organizations (FPO) have been filled by women in recent years.⁴

Although these efforts and recent achievements are highly important for our profession, leaders of several pediatric organizations have become concerned about another perceived trend. They observed that since the turn of the 21st century, the percentage of female pediatric residents in programs certified by the Accreditation Council for Graduate Medical Education (ACGME), 73% in 2012, was substantially greater than the ~50% of female residents overall.⁵ This trend raised the question as to whether pediatrics was attracting fewer men to the field and, if so, whether this trend was problematic. After a period of internal discussion, one of the national organizations (the Association of Medical School Pediatric Department Chairs) conducted a survey among its membership asking whether the chairs thought that the decreasing proportion of men in pediatrics was problematic.

Overall, 36% of the 91 respondents (from among 130 members) thought that the gender trend was problematic. However, there was a significant gender divide: 13 (59%) of the 22 female chairs thought it was problematic, compared with only 20 (29%) of their 69 male colleagues (Fisher exact test, 2-tailed $P = .0203$).

Unanticipated, there was also an apparent generational difference in the perception that the gender trend was problematic. Among the 40 chairs >60 years of age, 21 (66%) of the 32 male chairs were not concerned with the decreasing proportion of men in pediatric residencies, whereas only 1 (12.5%) of the 8 female chairs shared this perspective (Fisher exact test, 2-tailed $P = .0006$). By contrast, among the 51 chairs ≤60 years old, 20 (54%) of the 37 men and 6 (43%) of the 14 women did not perceive the preponderance of women entering the field as a problem ($P = .5414$). (Data available upon request from the authors.)

This generational difference observed among pediatric chairs flagged a second demographic transition confronting the pediatric profession, indeed all of the medical profession: Currently 4 generations (rather than 2 or 3 typical in previous eras) make up the workforce. At a time in which the team approach to pediatric care is rapidly increasing, the workforce is beginning to understand that each generation holds different values and that some of these values may be in conflict.⁶ Included among these differences are alternative views on work–life balance that affect a person's sense of how much work is reasonable.

Accordingly, FPO formed a working group to provide an overview of critical issues related to gender and generation as they may affect the pediatric workforce and the practice of pediatrics. This working group is 1 of 4 that were created to prepare for a Visioning Summit on the pediatric workforce that was held in the fall of 2013.⁷ The remainder

of this article presents the findings from the Work Group on Gender and Generations. Additional information about the Visioning Summit can be found at http://www.fopo.org/Visioning_summit.html.

GENDER INFLUENCES ON THE PEDIATRIC WORKFORCE AND PRACTICE

Gender Preferences and the Field of Pediatrics

Pediatrics has a higher proportion of female doctors than any other specialty in medicine, with the majority of pediatricians (57%) being women.⁸ Data from 1996 to 2012^{9–18} reveal a consistent trend of increasing proportion of women entering pediatrics. In 2012, there were 6092 (73%) female residents on duty in ACGME-accredited pediatric residencies and 2226 (27%) male residents.⁹ Figure 1 shows that the pediatric residency trend parallels an overall increase in the number of women completing medical school. However, there does not appear to be a decrease in the proportion of men choosing to enter pediatrics (Fig 2). Pediatrics traditionally has been a specialty that women are more interested in than men (women are roughly 3 times more likely to select pediatrics than men). In fact, in recent years there may be a slight decrease in the proportion of women graduating from medical school who are entering pediatrics, whereas the proportion of men is remaining steady or slightly increasing. The percentage of men interested in pediatrics represents an important future indicator that must be monitored.

Many workforce-related differences between male and female pediatricians have been reported in the medical literature.^{19–27} For example, female residents are more likely to report that structured hours are the most important factor in their post-residency career choice.²⁰ Among all

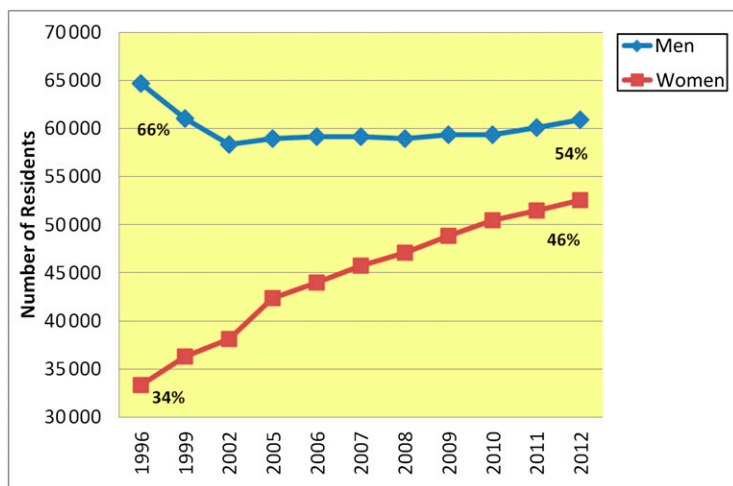


FIGURE 1
All residents in ACGME-accredited programs. Source: Data from Brotherton and Etzel.^{9–15}

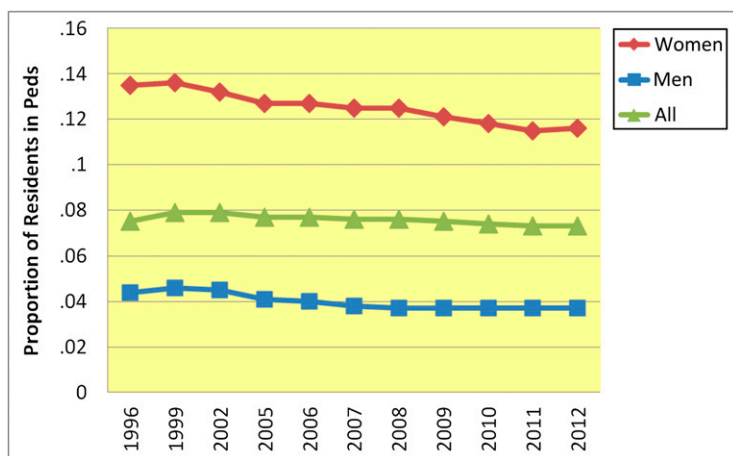


FIGURE 2
Rate of residents choosing pediatrics. Source: Data from Brotherton and Etzel.^{9–15}

pediatricians, women are much more likely to pursue and accept part-time positions.^{25–33}

The choice to pursue subspecialty training is another important workforce factor where gender differences have been found. Recently trained female subspecialists are more likely than male subspecialists to report that potential employment for their spouse is an important factor in their choice of fellowship program.²⁴ Female residents are more likely than male residents to be interested in general pediatrics rather than subspecialty care.^{20,21,31,32} This difference led to concern that the

number of residents pursuing subspecialist careers would decrease overall as the percentage of female pediatricians rose.³¹ This concern has proven to be unfounded, because for both men and women, there has been a trend over the last decade away from primary care and toward subspecialty careers.³³ Gender differences are also apparent across specific subspecialties, as women represent a larger proportion of adolescent medicine (86%) and developmental-behavioral subspecialty (82%) fellows and a smaller proportion of pediatric cardiology (53%) and pediatric critical

care (45%) fellows.³⁴ It is likely that subspecialties are altering their expectations with regard to lifestyle issues in response to changing preferences among the workforce.

Although clearly there are important gender differences between male and female pediatricians, it is much harder to gauge the similarities between them because nonsignificant findings are less likely to be highlighted in the literature. To help assess the extent of gender similarities, we conducted an analysis of 39 surveys of the American Academy of Pediatrics membership that have been conducted as part of the Periodic Survey of Fellows since 2000. These surveys have queried pediatricians about their practice characteristics and a wide variety of patient-related content areas, such as immunization practices and obesity counseling.^{28,29} To examine the overall prevalence of gender differences, a random sample of 10% of all survey questions was selected and tested for gender differences, yielding 653 variables for analysis. Only pediatricians who had completed their graduate medical education (ie, no residents or fellows) were included in the analyses, and all variables showing a gender difference were also retested while pediatrician age was controlled for (to ensure an independent gender effect). On average, 1600 pediatricians were included in each survey, with 57% providing valid responses. Overall, men and women were found to be more similar than different in how they practice pediatrics. No gender differences were found in 79% of the responses (83% after for age was controlled for).

Gender Differences for Success in Research Careers

A vast literature dating back decades addresses the relative lack of success of women compared with men in academic

science (including medicine) along multiple metrics. The Institute of Medicine report *Beyond Biases and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, from the Committee on Maximizing the Potential of Women in Academic Science and Engineering, thoughtfully examines the wide range of factors contributing to this landscape,⁵⁰ many of which have been amply documented in the field of pediatrics as well.^{2,3} As noted earlier in this article, gender equity in leadership roles over the last 5 to 10 years appears to be improving in pediatrics,⁴ but a separate and equally important issue for the profession and child health is women's achievement in research. Although the number of pediatric-specific analyses addressing this topic are limited, there are some more general reports. Pohlhaus et al³⁵ analyzed gender difference in the National Institutes of Health (NIH) award programs. In a cross-sectional analysis of funding in fiscal year 2008, they found that the success and degree of funding did not differ significantly for men and women. In programs where participation was lower for women, the disparity was related to a lower percentage of women applicants rather than a lower rate of success. However, their review of the data from a longitudinal career perspective (including evaluation of transition points, such as from a career development award to an independent [R01] research award) revealed a somewhat different picture. These analyses showed that men with previously funded NIH grants had higher application and funding rates than women at similar points in their career. On average, women had larger R01 grant awards than men, but men had more R01 awards than women at all points in their careers. Other studies have replicated this finding of lower rates of subsequent R01s among female compared with male former K-awardees.³⁶ The few studies that are pediatric-specific provide some additional insights. Jagsi

et al³⁷ reported in 2006 that the proportion of women as first and senior authors in 6 prominent medical journals had increased significantly over the past 4 decades; this increase was especially prominent in an obstetric and gynecology journal and a pediatric journal (*Journal of Pediatrics*), although men are still significantly more likely to hold these authorship positions. Gordon et al³⁸ found that among residents in the Boston Combined Residency Program in Pediatrics applying for internal grants, women compared with men received inferior scores even after the higher rates of advanced degrees among men were controlled for.

Consistent with the findings of the Institute of Medicine report on women in academic sciences,⁵⁰ Dr Sally Rockey, the NIH deputy director for extramural research, commented on these findings in her blog on April 27, 2011.³⁹ She suggested that differences that appear between men and women later in their careers may result from poorer retention of women in biomedical research as they progress through their careers. She posited that it would be important to evaluate trends in funding by gender in the future and helpful to have data that are discipline specific so trends between specialties can be compared. Increasing work hour flexibility during both research training and early faculty life may result in higher retention of the potential research workforce, potentially decreasing gender-based disparities in research success.^{3,30}

Gender Differences and the Perceptions of Patients

Rather than relying exclusively on our own profession's barometer regarding the impact of gender-based trends and differences, it is appropriate to explore whether our patients and their families perceive any differences and, if so, how they feel about them. There are few

data on these issues, but those that are available do not suggest cause for concern about the increasing proportion of women in pediatrics. Parents surveyed (who typically were mothers) tend to prefer female pediatricians. This preference probably results from differences in the manner in which female pediatricians interact with families noted in multiple studies over several decades. Women pediatricians spend more time with patients; provide more social exchange, more encouragement, and more reassurance; and are more likely to gather information directly from the children themselves.^{40–42} A study focusing on child preferences found that 38% of patients preferred a female physician, whereas 8% preferred a male physician; more than half had no gender preference. Girls compared with boys were significantly more likely to have a preference for their physician's gender (63% vs 27%, $P < .001$). Nearly all (97%) of girls preferred a female physician, whereas only half of boys (53%) preferred a male physician.⁴³ These data suggest that even if 70% of pediatricians were female, there would be sufficient male pediatricians to accommodate the preferences of boys preferring same gender.

GENERATIONAL INFLUENCES ON THE PEDIATRIC WORKFORCE AND PRACTICE

Generational Differences That Affect the Workforce

Currently 4 generations are represented in the pediatric workforce: the Silent Generation (born 1920–1940), Baby Boomers (born 1941–1960), Generation X (born 1961–1981), and Millennials (born 1981–2000). Values and characteristics attributed to the Silent Generation include “living to work,” patriotism, loyalty, respect for authority, discipline, sacrifice, hard work, delayed rewards, and adherence to rules. Baby Boomers value personal

growth and power, money, personal health and wellness, consensus building, being liked by others, and optimism. Those in Generation X are characterized as “working to live,” pragmatic, and skeptical and as valuing life–work balance, self-reliance, diversity, informality, and having fun at work. Millennials share the perspective of life–work balance with Generation Xers and value social networking, collaboration, achievement, respect for their contributions, and advocacy for the environment and global community.^{44–46} These differences, with values potentially in conflict between the different generations, have substantial implications for the workforce. Among Generation Xers and Millennials, the value placed on workplace flexibility and part-time work is generally shared by both men and women, with a blurring of traditional gender-based home and parenting responsibilities. One-third of married graduating pediatric residents are married to another physician, and most often the higher-income earner is not the pediatrician.²⁶ Regardless of gender, many pediatricians want to work fewer hours, have flexible work hours, or be part of shared practices (particularly younger pediatricians). An estimated 23% of pediatricians, both men (8%) and women (36%), are working part-time. Pediatricians are already working fewer weekly hours than they did a decade ago (43.3 hours in 2008–2012 compared with 49.6 hours in 1993–1996).^{26,27} Although fewer male than female pediatricians are looking for part-time positions, the rates of rise between men and women are exactly parallel.²⁷

An analysis of physicians in general found that two-thirds of physicians <50 years old would not be willing to work longer hours for more pay, and 80% would be pleased to work fewer hours if they could afford it. Nearly half (43%) are already working part-time.⁴⁷

However, the rate of rise of those looking for part-time work is the same for those <40 years old and those >50 years old. Partly this is because the “workaholic” (a term that emerged after the Boomers had been in the workforce for 20 years) Boomers want to wind down their careers and decrease their call burden. This desire places Boomers in direct conflict with Millennials. The workplace of the future has to be more flexible to allow physicians to ramp down and ramp up their careers or risk losing highly trained professionals permanently.⁴⁸

The younger generations are also redefining what is considered part-time work. The definition of part-time work as 24 to 25 hours per week has persisted over several decades.²⁷ This apparent increased interest in working fewer (including flexible) hours raises the concern that pediatricians desiring such an option may choose to leave the workforce completely rather than work a full-time position. To avoid this, practices must consider overcoming existing prejudices against part-time workers and make adjustments to pay, benefits, liability insurance coverage, and incentives. As practices expand the hours they are open to see patients, the value of a flexible workforce will increase and help retain pediatricians in the practice. Flexibility of hours and the possibility of weighting more heavily hours worked during less desirable shifts (in terms of salary or credit toward a full work schedule) would allow practices to expand hours and meet the desires of a changing workforce.

Generational Differences, the Use of Technology, and Their Impact on Future Pediatric Practice

In addition to the potential impact of changing workforce demographics on the practice of pediatrics, other forces may be very influential, including social

media and technology. Social media and technology are changing all aspects of medicine, including the 4 core areas of practice management, patient and family engagement, research, and medical education. As evidenced by the differences in adoption of the electronic medical record by age, these changes may differentially affect generations in the pediatric workforce.⁴⁹ There is reason to believe that the impact of technology on the profession as a whole will be significant, and there will be generational differences in its acceptance and even embracement. Members of the Silent Generation and Baby Boomers spent the majority of their lives without social media and Internet connectivity; Generation Xers and (especially) Millennials have spent most or all of their careers surrounded by social media and Internet connectivity. To the extent that the Silent Generation and Boomers use these media, they are “digital immigrants”; some Generation Xers and most Millennials are likely to be “digital natives,” reflecting lifelong immersion in the new technologies.⁵⁰ Generation X and Millennial workers are likely to expect their work environment to be outfitted with an electronic medical record and smartphones and to use social media. These tools allow them the flexibility to work at home or in the workplace and to communicate via modalities with which they have been familiar since childhood. Baby Boomer and the Silent Generation workers may be more skeptical about their importance, potentially leading to lower levels of adoption and less positive attitudes about usefulness.^{51,52}

Statistical data about technology adoption by providers and patients are constantly changing. The speed of trends in technology and innovation is not linear; it is exponential. A survey by Manhattan Research in 2013 to assess professional use by physicians in the

United States of the Internet, digital media, mobile devices, and other technology found that 72% of physicians had some type of tablet computer such as an iPad, an increase from 62% in 2012.⁵³

There are multiple emerging trends in the use of social media and technology for learning in medicine. Some of these arise from, and will probably grow secondary to, the learning preferences of digital natives. Habits of digital natives include viewing videos and pictures before reading text, attending to multiple sources of information and tasks at once, prioritizing learning that is immediate (when they want it) and fun when it can be, and electronically linking to more information and contributing to an information source when possible.⁵⁴

Generations and the Evolving Nature of Pediatric Practice

Over the last decade, technology has made it possible to be more *virtually* connected and efficient; at the same time, it has also made it possible to be more disconnected and distracted in *person*. Particularly relevant to the practice of medicine, social media, technology, and the Internet have shifted the focus of the health care “expert” from the physician to the patient. The patient-centered medical home is now a physical as well as virtual place. The impact of social media and technology on the practice of medicine has been predicted by some to be as great as or even greater than that of the introduction of antibiotics.⁵⁵ Patients and their parents will increasingly manage their own health care. Already people are turning to the Internet and doing Google searches before seeking care from a physician.⁵⁶

Millennials, who are the current and emerging parent population, are the first generation of digital native parents. One in 5 Millennials follow a health care provider online. They will look for immediate and unscheduled access to

providers through a growing number of websites (such as <http://www.zocdoc.com/mobile-apps>), and they may not feel the need to see the provider in person. Calling a practice and waiting on a phone to schedule an appointment or speak with a professional will become unacceptable. People between the ages of 18 and 25 years are twice as likely as those between 45 and 54 years to use social media for health-related information. The number of people who used their phone to look up health information almost doubled between 2010 and 2012.⁵⁶ One in 5 people of all ages in the United States have an “app” on their phone to track and monitor some aspect of their health. The “quantified self” movement, in which people use technology to track their steps, weight, blood pressure, and numerous other vital signs currently resides within the domain of the “worried well.” However, as employers and payers use these technologies as incentives to reduce health care costs, it is likely that this population will grow.⁵⁷ In pediatrics, this may lead to more effective remote monitoring by parents and providers of patients with chronic conditions such as diabetes.⁵⁸ Such innovations offer the potential to allow pediatric patients with chronic conditions more independence as they transition into adulthood.

Generational Influences on the Medical Home

The medical profession is making great strides in developing and refining the patient-centered medical home model; it appears that in the near future, the patient’s home will be the center of his or her care. As health care transitions from a fee-for-service model based on quantity to a model based on outcomes monitored and organized through accountable care organizations, it is likely that patients will present less frequently to the physician’s office and have

greater expectations of remote monitoring by the health care system. Meeting patient expectations of appropriate care in this changing environment, if not managed effectively, could require more rather than less physician time.⁵⁹ The Millennial parent population is willing to connect online. They are blogging and communicating with each other using technology. “Mom blogging” is emerging from a casual activity to a growing business industry. (See http://www.topmommyblogs.com/pages/health_fitness_diet_exercise_mom_blogs.html, for example.) Physicians will need to become a part of that community and join the discussion to provide an accurate online source of information about health, illness, and, in the case of pediatrics, child development.

Gamification provides a unique opportunity in pediatrics. The profession has long recognized the value of play as a way to provide comfort for children anxious about a procedure^{60,61} or to reduce perceived pain.⁶² Now technology has made available games to train our pediatric patients not only to understand a medical condition but to begin to self-monitor and track their health status, so that by adulthood, such self-monitoring has become a habit. Gamification and pulsed learning hold promise for increasing memory capacity^{63,64}; it will be important for pediatricians to remain informed about such new technologies because patients and their families will probably seek advice from their physicians about the utility of such innovations.

With advancing technologies, remote monitoring of health is becoming increasingly possible, and parents are primed to partner with providers in that effort. Digital native parents who would prefer to text a picture of a rash than to visit the physician’s office may be much easier for the younger physician generation to work with than the older adult for whom the latest technology is

foreign. Given the generational differences in the workforce, Silent Generation and Boomer physicians might prefer to see the patient (and the rash) in person.

Social Media, Generations, and Pediatrics

Social Media and Their Potential Impact on Academic Medicine

Social media have the potential to affect academic medicine, including research. Social media creates an opportunity to expand a physician's network and, by extension, his or her knowledge base through open dialogue and debate with a broader, more diverse group, presenting a powerful opportunity for meaningful community engagement and collaboration. Online connections become offline collaborators. Articles that are tweeted are cited more frequently.⁶⁵ New ideas are rapidly shared, such as the blog posted by a physician at FutureDocs.com titled "Twitter to Tenure: 7 Ways Social Media Advances My Career." As funding levels from the NIH make it increasingly difficult for new investigators to gain traction in establishing their research careers, social media and technology offer new and innovative ways to fund research, such as crowdfunding (see www.crowdfunding.com). Although the concept of crowdfunding to support research is tantalizing, it has not been tested in academic research endeavors and is not peer-reviewed, so its place in academic research is unknown.

Evolving Media and Their Potential Impact on Academic Education

Twitter is affecting academia in another way: It is being used to deliver educational content to medical learners through tweets that contain small bullets of information that can hyperlink to additional information and be shared with others through retweeting. This

use of Twitter for learning in medicine capitalizes on several preferences of digital natives, including receiving multiple pieces of information in close temporal relationship to one another; information that is immediate; learning that is fun, brief, and can hyperlink to additional information; and educational content that the user can contribute to by adding information and retweeting to others.

Another trend in the use of technology for learning in medicine that aligns with the preferences of digital natives is point-of-care or just-in-time teaching. Perhaps the most prevalent example of this educational innovation is the use of online videos to teach procedural skills. These videos tend to be short, and although they can be used as part of a larger curriculum, they are well positioned to be viewed in the actual working and learning environment immediately before the learner attempts a procedure, such as performing a lumbar puncture on an infant or suturing a simple laceration on a child's arm. Videos such as those used for point-of-care and just-in-time teaching can also be used in the emerging approach to learning in medicine, the so-called flipped classroom. Capitalizing on the preference among digital natives to watch didactic content online, the flipped classroom delivers content via web videos and then uses in-person time to build from this knowledge via discussion (see www.khanacademy.org). This is "flipped" because this didactic delivery traditionally has happened during scheduled lectures, with work that builds from the lectures done later, outside the classroom. Flipped learning works well for instruction during training and in continuing medical education efforts. One such example is the use of OPENPediatrics (www.openpediatrics.org), an online repository of videos and learning activities for pediatric critical care that

pediatric residents can use for foundational learning at home or on call. As a result, didactic time during the critical care rotation can be spent on cases and discussions that build from this baseline knowledge.

Technological advances make it possible for pediatricians in academic medicine to disseminate their work more quickly than in previous eras, potentially leading to a shortening of time from discovery to widespread practice. For education, novel technologies have the potential to increase and reinforce medical knowledge to improve patient care.

Generational Shifts and an Evolving Workforce

As noted earlier in this article, an increasing proportion of pediatricians want to work part-time and are working part-time. Although the rates are higher among women, they are increasing among both genders.^{26,27,66} In addition, pediatricians plan to retire at a younger age than previously, particularly women and younger pediatricians (those ≤ 35 years of age expect to retire at 58 years, those 45–54 years expect to retire at 63 years, and those > 65 years expect to retire at 71 years).⁶⁷ However, the absolute number of children continues to increase.⁶⁸ Given the preponderance of women in the pediatric workforce < 35 years old, if their stated intention to retire in their late 50s (rather than mid-60s or 70s, reflecting current practice) prevails, there will be a critical need for additional pediatricians or other care providers to serve the pediatric population. Of course, it is also possible that as these young pediatricians advance, their interest in retiring in their late 50s will not persist. Thus, the challenging question is whether we will need to train more pediatricians or whether other health care professionals will be able to fill the gap.

The generational shifts affecting the workforce have implications beyond part-time and shared job positions. The impacts emanating from a desire to work fewer hours will need to be addressed. Pediatrics must also provide better direction for those who seek reentry while supporting the needs of those ramping up and down at different stages of their careers. These circumstances require system solutions, not just attention to individual practices or individual job positions.

Also relevant to this question of “Who will do the work?” is the trajectory of a pediatrician’s “50-year career” (although given the preceding discussion, in future generations this timeline may be somewhat truncated). At least through the Baby Boomers, this career has included

- 10 years of training
- 10 years of establishing oneself in the community, in a tertiary care center, or in a university academic center
- 10 years of engaging in the profession, the community, and various institutions

- 10 years of taking on additional responsibilities such as mentoring, complex situations such as community politics and advocacy, professional association work, administration, and innovation
- 10 years of winding down, shifting gears, and pursuing one’s heart’s desire^{69,70}

Within such a framework senior pediatricians may be considered an untapped resource. As work life changes, there is the opportunity to explore new and appropriate roles for senior pediatricians. This will require flexibility and creativity on the part of the individual physician and from the broader medical system.

FINAL THOUGHTS

There are many evolving trends related to gender and generational issues in pediatrics. We have presented a potpourri of ideas and findings derived from the year-long work of the Gender and Generations Working Group as part of the FOPO Visioning Summit process. Though open to interpretation, the available data suggest several broad trends relevant to the pediatric work-

force over the next 2 decades. The trends in the proportions of men and women entering pediatrics are similar to those observed over the past few decades, and therefore it is likely that changes in the overall ratio of men and women will not substantially affect pediatric practice. However, although women may be as likely to *succeed* in academic medicine, including research, fewer women than men *enter* research, thereby potentially decreasing the number of pediatric researchers as the proportion of women in the pediatric workforce increases. The differences between the 4 generations currently in pediatrics are real and substantial and have significant implications for the workforce. To capitalize on trained pediatricians at all stages in their careers, the workplace of the future has to be more flexible with regard to work hours and roles. Differences between the 4 generational groups in the pediatric workforce are likely to result in a continuing evolution of the professional life dedicated to patient care, research, and education, particularly related to the aspects of work–life balance and use of technology and social media.

REFERENCES

1. Shrier DK, Shrier LA, Rich M, Greenberg L. Pediatricians leading the way: integrating a career and a family/personal life over the life cycle. *Pediatrics*. 2006;117(2):519–522
2. Women Chairs of the Association of Medical School Pediatric Department Chairs. Women in pediatrics: recommendations for the future. *Pediatrics*. 2007;119(5):1000–1005
3. Alexander D, Boat T, Britto M, et al; FOPO Task Force on Women in Pediatrics. Considerations for part-time training and employment for research-intensive fellows and faculty. *J Pediatrics*. 2009;154:1–3
4. Stanton B, Felice M, Marshall S, Sectish T. A change in the pediatric landscape. *J Pediatr*. 2011;158(3):347–348.e2
5. Women in Pediatrics. AAP.org. Available at: www.aap.org/en-us/about-the-aap/departments-and-divisions/department-of-education/Pages/Women-in-Peds.aspx
6. Raines C. *Connecting Generations: The Sourcebook for a New Workplace*. Menlo Park, CA: Crisp Learning, 2003
7. Sectish T. Working groups summarize the major issues forces and trends within their domains and prepare for the Visioning Summit in 2013: the future of the workforce in pediatrics. Available at: www.amspdc.org/FOPOBulletin_Jan_31_2013.cfm
8. American Medical Association. *Survey & Data Resources. Physician Characteristics and Distribution in the US. Survey & Data Resources*. Chicago, IL: American Medical Association; 2013
9. Brotherton SE, Etzel SI. Graduate medical education, 2011–2012. *JAMA*. 2012;308(21):2264–2279
10. Brotherton SE, Etzel SI. Graduate medical education, 2010–2011. *JAMA*. 2011;306(9):1015–1030
11. Brotherton SE, Etzel SI. Graduate medical education, 2009–2010. *JAMA*. 2010;304(11):1255–1270
12. Brotherton SE, Etzel SI. Graduate medical education, 2008–2009. *JAMA*. 2009;302(12):1357–1372
13. Brotherton SE, Etzel SI. Graduate medical education, 2007–2008. *JAMA*. 2008;300(10):1228–1243
14. Brotherton SE, Etzel SI. Graduate medical education, 2006–2007. *JAMA*. 2007;298(9):1081–1096
15. Brotherton SE, Etzel SI. Graduate medical education, 2005–2006. *JAMA*. 2006;296(9):1154–1169

16. Brotherton SE, Rockey PH, Etzel SI. US graduate medical education, 2004–2005: trends in primary care specialties. *JAMA*. 2005;294(9):1075–1082
17. Brotherton SE, Rockey PH, Etzel SI. US graduate medical education, 2003–2004. *JAMA*. 2004;292(9):1032–1037
18. Brotherton SE, Rockey PH, Etzel SI. US graduate medical education, 2002–2003. *JAMA*. 2003;290(9):1197–1202
19. Goodman DC; Committee on Pediatric Workforce. The pediatrician workforce: current status and future prospects. *Pediatrics*. 2005;116(1). Available at: www.pediatrics.org/cgi/content/full/116/1/e156
20. Freed GL, Dunham KM, Jones MD Jr, McGuinness GA, Althouse L; Research Advisory Committee of the American Board of Pediatrics. General pediatrics resident perspectives on training decisions and career choice. *Pediatrics*. 2009;123(suppl 1):S26–S30
21. Frintner MP, Mulvey HJ, Pletcher BA, Olson LM. Pediatric resident debt and career intentions. *Pediatrics*. 2013;131(2):312–318
22. Freed GL, Dunham KM, Switalski KE, Jones MD Jr, McGuinness GA; Research Advisory Committee of the American Board of Pediatrics. Recently trained general pediatricians: perspectives on residency training and scope of practice. *Pediatrics*. 2009;123(suppl 1):S38–S43
23. Freed GL, Dunham KM, Switalski KE, Jones MD Jr, McGuinness GA; Research Advisory Committee of the American Board of Pediatrics. Pediatric fellows: perspectives on training and future scope of practice. *Pediatrics*. 2009;123(suppl 1):S31–S37
24. Freed GL, Dunham KM, Switalski KE, Jones MD Jr, McGuinness GA; Research Advisory Committee of the American Board of Pediatrics. Recently trained pediatric subspecialists: perspectives on training and scope of practice. *Pediatrics*. 2009;123(suppl 1):S44–S49
25. Fix AL, Kaelber DC, Melgar TA, Chamberlain J, Cull W, Robbins BW. Graduating med-peds residents' interest in part-time employment. *Acad Pediatr*. 2011;11(5):369–374
26. Cull WL, Caspary GL, Olson LM. Many pediatric residents seek and obtain part-time positions. *Pediatrics*. 2008;121(2):276–281
27. Cull WL, O'Connor KG, Olson LM. Part-time work among pediatricians expands. *Pediatrics*. 2010;125(1):152–157
28. AAP periodic survey. Available at: www.aap.org/en-us/professional-resources/Research/pediatrician-surveys/Pages/Periodic-Survey-of-Fellows.aspx
29. Cull WL, O'Connor KG, Sharp S, Tang SF. Response rates and response bias for 50 surveys of pediatricians. *Health Serv Res*. 2005;40(1):213–226
30. Committee on Maximizing the Potential of Women in Academic Science and Engineering; Committee on Science, Engineering, and Public Policy; National Academy of Sciences; National Academy of Engineering; Institute of Medicine. *Beyond Biases and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*. Washington, DC: The National Academies; 2007
31. Pan RJ, Cull WL, Brotherton SE. Pediatric residents' career intentions: data from the leading edge of the pediatrician workforce. *Pediatrics*. 2002;109(2):182–188
32. Harris MC, Marx J, Gallagher PR, Ludwig S. General vs subspecialty pediatrics: factors leading to residents' career decisions over a 12-year period. *Arch Pediatr Adolesc Med*. 2005;159(3):212–216
33. AAP graduating resident survey. Available at: www.aap.org/en-us/professional-resources/Research/pediatrician-surveys/Documents/Graduating_Residents_Survey_Trend_Data-Practice_Goals_by_Gender.pdf. Accessed February 19, 2014
34. American Board of Pediatrics. 2012 workforce data. Available at: <https://www.abp.org/ABPWebStatic/#murl%3D%2FABPWebStatic%2FaboutPed.html%26sur%3D%2Fabpwebsite%2Fstats%2Fwrkstatintro.htm>. Accessed February 20, 2014
35. Pohlhaus JR, Jiang H, Wagner RM, Schaffer WT, Pinn VW. Sex differences in application, success, and funding rates for NIH extramural programs. *Acad Med*. 2011;86(6):759–767
36. Jagsi R, Motomura AR, Griffith KA, Rangarajan S, Ubel PA. Sex differences in attainment of independent funding by career development awardees. *Ann Intern Med*. 2009;151(11):804–811
37. Jagsi R, Guancial EA, Worobey CC, et al. The “gender gap” in authorship of academic medical literature—a 35-year perspective. *N Engl J Med*. 2006;355(3):281–287
38. Gordon MB, Osganian SK, Emans SJ, Lovejoy FH Jr. Gender differences in research grant applications for pediatric residents. *Pediatrics*. 2009;124(2). Available at: www.pediatrics.org/cgi/content/full/124/2/e355
39. Rockey S. More on women in research careers. 2011. Available at: <http://nexus.od.nih.gov/all/2011/04/27/more-on-women-in-research-careers/>
40. Bernzweig J, Takayama JI, Phibbs C, Lewis C, Pantell RH. Gender differences in physician–patient communication. Evidence from pediatric visits. *Arch Pediatr Adolesc Med*. 1997;151(6):586–591
41. Roter DL, Hall JA, Aoki Y. Physician gender effects in medical communication: a meta-analytic review. *JAMA*. 2002;288(6):756–764
42. Roter DL, Hall JA. Physician gender and patient-centered communication: a critical review of empirical research. *Annu Rev Public Health*. 2004;25:497–519
43. Turow JA, Sterling RC. The role and impact of gender and age on children's preferences for pediatricians. *Ambul Pediatr*. 2004;4(4):340–343
44. Keeter S, Taylor P. The Millennials. The Pew Research Center Numbers, Facts and Trends Shaping Your World. Dec 10, 2009. Available at: www.pewresearch.org/2009/12/10/the-millennials/
45. Mitchell S. *American Generations: Who They Are, How They Live, What They Think*. Ithaca, NY: New Strategists Publications; 2002
46. Kalar T. Motivation in a multigenerational radiologic science workplace. *Radiol Manage*. 2008;30(4):47–51
47. Grover A. Physician workforce issues. AAMC. Available at: http://michigan.gov/documents/healthcareworkforcecenter/WayneStatePresentationGROVER_192782_7.pdf
48. Hewlett SA. *Off-Ramps and On-Ramps: Keeping Talented Women on the Road to Success*. Watertown, MA: Harvard Business Press; 2007
49. Jamoom E, Beatty P, Bercovitz A, et al. *Physician Adoption of Electronic Health Record Systems: United States, 2011*. *NCHS Data Brief, no 98*. Hyattsville, MD: National Center for Health Statistics; 2012
50. Prensky M. Digital natives, digital immigrants. *On the Horizon*. 2001;9(5):1–6
51. McGowan BS, Wasko M, Vartabedian BS, Miller RS, Freiherr DD, Abdolrasulnia M. Understanding the factors that influence the adoption and meaningful use of social media by physicians to share medical information. *J Med Internet Res*. 2012;14(5):e117
52. Rothe P, Lindholm AL, Hyvönen A, Nenonen S. Work environment preferences – does age make a difference? *Facilities*. 2012;30(1–2):78–95
53. Comstock J. Manhattan: 72 percent of physicians have tablets. *Mobile Health News*. April 18, 2013. Available at: <http://mobihealthnews.com/21733/manhattan-72-percent-of-physicians-have-tablets/>
54. O'Donnell J. Definition of digital natives. About.com Guide. Available at: <http://tweenparenting.about.com/od/tweenculture/g/DigitalNative.htm>. Accessed June 9, 2013
55. Topol E. *The Creative Destruction of Medicine: How the Digital Revolution Will Create*

- Better Health Care*. New York, NY: Basic Books; 2012
56. Fox S, Duggan M. Tracking for health. January 28, 2013. Available at: <http://pewinternet.org/Reports/2013/Health-online.aspx>
 57. Kreckley PH, Coughlin SH, Stanley EL. *Deloitte 2013 Survey of U.S. Physicians: Physician Perspectives About Health Care Reform and the Future of the Medical Profession*. New York, NY: Deloitte Development LLC; 2013
 58. Pena V, Watson AJ, Kvedar JC, Grant RW. Mobile phone technology for children with type 1 and type 2 diabetes: a parent survey. *J Diabetes Sci Tech*. 2009;3(6):1481–1489
 59. Chhabra K. Tag Archives: Patient Centered Medicine. Project Millennial: A generation challenging the current face of health care: Redefining what it means to be against the status quo. 2013. Available at: <http://projectmillennial.org/tag/patient-centered-medicine/>
 60. Mohr DC, Burns MN, Schueller SM, Clarke G, Klinkman M. Behavioral intervention technologies: evidence review and recommendations for future research in mental health. *Gen Hosp Psychiatry*. 2013;35(4):332–338
 61. Gold JI, Kim SH, Kant AJ, Joseph MH, Rizzo AS. Effectiveness of virtual reality for pediatric pain distraction during I.V. placement. *Cyberpsychol Behav*. 2006;9(2):207–212
 62. Miller K, Rodger S, Bucolo S, Greer R, Kimble RM. Multi-modal distraction. Using technology to combat pain in young children with burn injuries. *Burns*. 2010;36(5):647–658
 63. Kerfoot BP, Baker H. An online spaced-education game for global continuing medical education: a randomized trial. *Ann Surg*. 2012;256(1):33–38
 64. Kerfoot BP, Baker H, Pangaro L, et al. An online spaced-education game to teach and assess medical students: a multi-institutional prospective trial. *Acad Med*. 2012;87(10):1443–1449
 65. Eysenbach G. Can tweets predict citations? Metrics of social impact based on Twitter and correlation with traditional metrics of scientific impact. *J Med Internet Res*. 2011;13(4):e123
 66. Olson L, O'Connor K, Meline A, Cull W. Trends in hours worked in general pediatrics 1993 to 2010: age, gender and practice type. Elk Grove Village, IL: American Academy of Pediatrics. Available at: www.aap.org/en-us/professional-resources/Research/research-findings/Pages/Trends-in-Hours-Worked-in-General-Pediatrics-1993-to-2010-Age-Gender-and-Practice-Type.aspx
 67. Merline AC, Cull WL, Mulvey HJ, Katcher AL. Patterns of work and retirement among pediatricians aged > or = 50 years. *Pediatrics*. 2010;125(1):158–164
 68. Federal Interagency Forum on Child and Family Statistics. 2013. America's children: key national indicators of well-being, 2013. Washington, DC: US Government Printing Office; 2013. Available at: www.childstats.gov/pdf/ac2013/ac_13.pdf
 69. Hall JG. Trajectory of an academic career: the coming of age of academic pediatricians. *JAMA Pediatr*. 2013;167(2):108–109
 70. Hall JG. The challenge of developing career pathways for senior academic pediatricians. *Pediatr Res*. 2005;57(6):914–919

(Continued from first page)

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2014 by the American Academy of Pediatrics

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: Supported by the Federation of Pediatric Organizations.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

Gender and Generational Influences on the Pediatric Workforce and Practice
Nancy D. Spector, William Cull, Stephen R. Daniels, Joseph Gilhooly, Judith Hall,
Ivor Horn, Susan G. Marshall, Daniel J. Schumacher, Theodore C. Sectish and Bonita
F. Stanton

Pediatrics 2014;133;1112

DOI: 10.1542/peds.2013-3016 originally published online May 12, 2014;

Updated Information & Services	including high resolution figures, can be found at: http://pediatrics.aappublications.org/content/133/6/1112
References	This article cites 48 articles, 13 of which you can access for free at: http://pediatrics.aappublications.org/content/133/6/1112#BIBL
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.aappublications.org/site/misc/Permissions.xhtml
Reprints	Information about ordering reprints can be found online: http://www.aappublications.org/site/misc/reprints.xhtml

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Gender and Generational Influences on the Pediatric Workforce and Practice

Nancy D. Spector, William Cull, Stephen R. Daniels, Joseph Gilhooly, Judith Hall,
Ivor Horn, Susan G. Marshall, Daniel J. Schumacher, Theodore C. Sectish and Bonita
F. Stanton

Pediatrics 2014;133;1112

DOI: 10.1542/peds.2013-3016 originally published online May 12, 2014;

The online version of this article, along with updated information and services, is
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/133/6/1112>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2014 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

