

4-4-2009

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## Repository Citation

Cashman, Suzanne B.; Savageau, Judith A.; Ferguson, Warren J.; and Lasser, Daniel H., "Community dimensions and HPSA practice location: 30 years of family medicine training" (2009). *Family Medicine and Community Health Publications and Presentations*. Paper 125.

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# Community dimensions and HPSA practice location: 30 years of family medicine training

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Citation: Fam Med. 2009 Apr;41(4):255-61.

## Community Dimensions and HPSA Practice Location: 30 Years of Family Medicine Training

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**Background and Objectives:** *Our objective was to assess practicing family physicians' confidence and participation in a range of community-related activities. Additionally, we assessed the strength of the relationship between the physicians' reported medical school and residency training in community-related activities and their current community activities, as well as whether they were practicing in an underserved location. **Methods:** All 347 graduates of the University of Massachusetts Family Medicine Residency were surveyed about practice location and type, involvement and training in community work, confidence in community-related skills, and sociodemographic characteristics. Analyses were conducted by residency graduation decade (1976–1985, 1986–1995, and 1996–2005). **Results:** Earlier graduates (1976–1985) were significantly more likely to engage in an array of community-related activities, but recent graduates (1996–2005) were more likely to report having been trained in these skills. There was a significant positive association between practice in an underserved area and confidence in issues related to sociocultural aspects of care. While recent graduates were more likely to locate both initial and current practices in a Health Professions Shortage Area (HPSA), 20.6% of all graduates reported an initial practice in a HPSA. **Conclusions:** While family physician involvement in community-related activities increases with years out of residency, a higher proportion of recent graduates report having learned community-related skills while in medical school. Physician relocation tends to be away from HPSA toward non-HPSA sites.*

(Fam Med 2009;41(4):255-61.)

In 1996, the Institute of Medicine revised the definition of primary care to include “the community context of medical practice.” Shortly after, as a way to move beyond the general sentiment that community should factor into a physician’s work, Pathman et al<sup>1</sup> identified and defined four distinct categories of activities (sociocultural aspects of patient care, use of community health resources, community-oriented primary care, and community participation and assimilation) through which physicians engage with communities. This framed much of the last decade’s discussion about and exploration into physicians’ community involvement.<sup>2-6</sup>

Recently, the concept of community has been raised by the Future of Family Medicine Project.<sup>7</sup> With the spe-

cialty’s founders feeling strongly that family physicians should be the doctors for their communities,<sup>8</sup> the specialty of family medicine has committed to instruction in numerous community-related skills meant to complement clinical training. Clinical training and practice, however, have changed over time. There have been notable declines in the proportion of family physicians engaged in delivering babies, providing intensive care and general hospital medicine, and performing certain procedures.<sup>9</sup> Unknown is whether these changes have been accompanied by changes in family physicians’ level and type of community involvement.

To our knowledge, no studies have explored family physicians’ community-related activities longitudinally. Thus, we surveyed 30 years of graduates from one family medicine residency to assess confidence in and participation in a range of community-related activities. Additionally, we explored strength of relationships between reported medical school and residency training in community-related activities and current community involvement, as well as whether they were practicing in an underserved location.

## Methods

### *Subjects and Setting*

We used a departmental database to identify all physicians who had graduated from the University of Massachusetts Family Medicine Residency since its inception; the first class completed training in 1975. Founders designed the residency as a university-based program with strong emphasis on community-based training experiences. Consequently, while inpatient training occurred in the city of Worcester, three community-based training sites, each with 12 residents, provided an ambulatory continuity practice experience.

Since its beginning, the residency has used the Family Medicine Residency Review Committee (RRC) to guide the content of a community medicine experience. Taught during dedicated block time in the intern year, while its themes and content have not changed significantly over time, its structure and organizational approaches have varied. For the residency's first 2 decades, community medicine training was centralized and residents experienced it largely as a tutorial. One resident at a time worked with the faculty member for 3 weeks to learn the range of community resources and agencies available to provide patient services. In addition, residents had a 2-week orientation to their ambulatory health center site. In 1995, the program decentralized the rotation, merging the community medicine block with site orientation for a 2-week experience in community medicine. Each ambulatory training site fashioned a group experience that featured local health and human service agencies. Across all 3 decades, residents have participated consistently in community medicine workshops that have featured RRC-required topical issues.

### *Instrument*

To construct an instrument to elicit information about graduates' community involvement and level of confidence in community activities, as well as practice settings and aspects of medical training, we revised the questionnaire used in Pathman's study of physicians' community dimensions of practice.<sup>1</sup> We condensed the questions from that study to a four-sided 16-question booklet. In adapting the instrument, we selected three of that study's topical categories and sample response lists. One category, participation in community activities, required a yes/no response. A second category, confidence in 15 community-relevant abilities, used a 5-point Likert scale. Finally, training content, defined as none, moderate, or extensive, used a 3-point Likert scale. In most instances, we used questions verbatim.

Regarding the activities question, we asked respondents to reply relative to their "current or most recent practice" rather than the earlier study's "in the past 2 years." We included verbatim two of that instrument's questions about respondents' level of community inter-

est and involvement during medical school training and contact with community-active physicians during medical school and residency (both using a 5-point Likert scale). Also included in our survey were questions related to sociodemographic characteristics and whether the respondent had additional training since completing residency or had a National Health Service Corps scholarship or other loan repayment obligation.

### *Procedures*

We pilot tested a draft version of the survey instrument with six residency graduates; based on those results, we made minor edits for clarity. A survey packet including a cover letter from the department chair, a questionnaire with a stamped return addressed envelope, and two new \$1 bills was mailed to each graduate. Guided by Dillman's Total Design Method,<sup>10</sup> approximately 2 weeks after the initial mailing, each graduate received a postcard reminder/thank you. Full survey packets were mailed to graduates who had not yet responded at 2- and 3-week intervals thereafter. This was followed several weeks later by a final e-mail reminder from the residency director.

To determine if a respondent's initial or current practice was in a federally designated Health Professions Shortage Area (HPSA), we asked about the graduates' types of practice. In addition to a direct response indicating a defined HPSA site, if practice type was characterized as a community or federally qualified health center, Indian Health Service, or migrant and/or a homeless population, it was deemed to be in a shortage area. All of the above-described study methods were approved by the University of Massachusetts' Institutional Review Board.

### *Data Analysis*

Data were analyzed using SPSS/PC statistical software (V14.0 SPSS, Inc, Chicago, 2006). We used univariate statistics to describe the study population, their practice settings and types, as well as their reported level of comfort with selected community-related activities and involvement in activities related to community aspects of care. To examine differences among cohorts of graduates related to HPSA practice locations and reported involvement in community-related activities, we divided respondents by decade of graduation (1976–1985, 1986–1995, and 1996–2005) and used chi-square tests to assess significance at the .05 level.

Factor analysis was performed on results of reported levels of confidence in 15 community-relevant activities and used to assess the four dimensions of community involvement Pathman described. We used linear regression to evaluate the association between each of the four community dimension factors and independent variables that included demographics, practice in an underserved community, and respondents' reported

level of interest in community involvement. One-way ANOVA was used to test for differences among the four community dimensions of practice and selected sociodemographic variables as well as variables related to education and training exposure, interest in community, and practice characteristics.

## Results

### Respondents

A total of 350 graduates were identified but only 347 survey packets were mailed, since three graduates were known to have died. Twenty-one surveys were returned marked “undeliverable,” with current addresses unidentifiable.

Among the 326 graduates who received a survey packet, 262 returned completed questionnaires, for a response rate of 80.4% (75.5% of all surveys originally mailed). Respondents were evenly split between males and females (50.6% and 49.4%, respectively). Their mean age was 44.9 years (standard deviation [SD]=8.4) and 88.0% were white. The 262 respondents represented graduates of 70 different medical schools.

Study respondents' numbers increased with each graduation decade. Specifically, 27.5% (n=72) of respondents graduated between 1976 and 1985, 30.5% (n=80) between 1986 and 1995, and 42.0% (n=110) between 1996 and 2005. Response rates by graduation decade were similar. Compared to respondents, non-respondents were more likely to be female, to have been in the earliest graduating cohort, and to have had their residency continuity practice at the hospital-owned urban health center.

### Respondent Characteristics and Practice Sites

Characteristics of residency graduates by decade of graduation appear in Table 1. Approximately 15% (14.9%) reported currently practicing in a HPSA; one fifth (20.6%) had had an initial practice in a short-age area.

### Participation in Community Activities

Compared to more recent graduates, respondents in the earlier graduating cohort (1976–1985) were significantly more likely to report participation in any of 10 different community-related activities in either their current or most recent

practice (Table 2). Earlier graduates were also more likely to report feeling appreciated by the community. Examined by gender, male respondents were statistically more likely than female respondents to report being involved in six of the 10 activities: providing expert testimony, speaking to a community group, volunteering expertise to a community organization, working with a community group to address a local health problem, becoming involved in a community issues, and feeling appreciated by the community.

In contrast to the earlier graduating cohorts' reports of greater community involvement, respondents from the most recent graduation decade (1996–2005) were significantly more likely to report having had at least moderate training during medical school in several aspects of community-related issues, specifically training in underserved population medicine ( $P=.027$ ), patient use of conventional home remedies ( $P<.001$ ), ways of identifying health problems in the community ( $P=.018$ ) as well as of working with communities around health issues ( $P=.008$ ), ways physicians become accepted into their communities ( $P=.012$ ), and cultural issues in health care ( $P<.001$ ). At the level of residency training, only two community-related issues (use of conventional home remedies and ways of identifying health problems in the community) differed significantly ( $P=.001$  and  $P=.045$ , respectively) by graduation decade, with more recent graduates more likely to have had training in these topics (data not shown).

Table 1

Characteristics of Responding Physicians by Decade of Graduation

Characteristic	Decade of Graduation (n=262)			
	1976–1985 n=72 (27.5%)	1986–1995 n=80 (30.5%)	1996–2005 n=110 (42.0%)	1976–2005 n=262
Age (in years)	Mean=53.5 SD=2.8	Mean=47.9 SD=4.4	Mean=37.1 SD=5.6	Mean=44.9 SD=8.4
Gender				
Male	49 (68.1)	43 (53.8)	40 (36.7)	132 (50.6)
Female	23 (31.9)	37 (46.3)	69 (63.3)	129 (49.4)
Race				
White	61 (93.8)	63 (91.3)	81 (81.8)	205 (88.0)
Other	4 (6.2)	6 (8.7)	18 (18.2)	28 (12.0)
Ethnicity				
Latino	2 (3.1)	4 (6.1)	3 (3.0)	9 (3.9)
Initial practice				
HPSA	12 (16.7)	19 (23.8)	23 (20.9)	54 (20.6)
Current practice				
HPSA	7 (9.7)	12 (15.0)	20 (18.2)	39 (14.9)

SD—standard deviation

HPSA—Health Professions Shortage Area

Table 2

Physicians' Reported Participation in a Range of Community-related Activities  
in Current or Most Recent Practice (n=262)

Community-related Activity	Graduation Decade			P Value	Total 1976–2005 n (%)
	1976–1985 n (%)	1986–1995 n (%)	1996–2005 n (%)		
<b>Participation in Health Activities in the Community</b>					
Attempted to identify major community problem	35 (51.0)	38 (49.4)	42 (40.0)	NS	115 (45.6)
Gathered data on community health problem	28 (39.4)	20 (26.0)	25 (23.6)	NS	73 (28.7)
Participated in community health fair	44 (62.9)	42 (37.4)	38 (52.2)	$P=.001$	124 (49.2)
Provided expert testimony	20 (28.6)	14 (18.2)	8 (17.6)	$P=.001$	42 (16.6)
Spoke to a community group	46 (65.7)	46 (59.7)	46 (43.4)	$P=.008$	138 (54.5)
Volunteered expertise to a community organization	48 (67.6)	47 (61.0)	37 (34.9)	$P<.001$	132 (52.0)
Worked with community group to address local health problem	38 (53.3)	31 (40.3)	28 (26.4)	$P<.001$	97 (38.2)
Wrote for/appeared in health-related media	41 (57.7)	35 (45.5)	25 (23.8)	$P<.001$	101 (39.9)
<b>Community Participation and Assimilation</b>					
Became involved in community issue	48 (67.6)	44 (57.9)	44 (41.5)	$P=.002$	136 (53.8)
Felt appreciated by your community	59 (88.1)	61 (84.7)	72 (70.6)	$P=.010$	192 (79.7)

NS—not significant

Using a 5-point scale to reflect the amount of contact (ranging from 1 for none to 5 for extensive) graduates had while in medical school and in residency with physicians active in the community, the mean score for all respondents commenting on their medical school experience was 2.52 (SD=1.18). The mean among these same respondents characterizing similar exposure during residency was almost a full point higher (3.48, SD=1.12). Graduates in the later two cohorts, 1986–1995 and 1996–2005, reported significantly more contact with a physician active in the community while in medical school than graduates from the 1976–1985 cohort ( $F=7.390$ ,  $P=.001$ ). The differences were not significant at the residency level, however (data not shown).

#### Confidence in Community Dimensions of Practice

Our respondents' ratings of confidence in community dimensions of practice sorted into one of four groupings: sociocultural aspects of patient care (Factor 1), informed and appropriate use of community's health resources (Factor 2), participation in community health activities (community-oriented primary care) (Factor 3), and community participation and assimilation (Factor 4). Tested against reported frequency (never/sometimes versus usually/always) of addressing any of

seven different issues, such as treatment affordability, social support, and illness beliefs with their patients, respondents confident in incorporating sociocultural aspects of patient care reported addressing each of these issues more often than non-confident graduates. Each of the subsequent factors showed declining proportions of respondents reporting that they addressed these issues with patients to the point that in the case of Factor 4, greater confidence was not associated with frequency of discussing any of the issues (data not shown).

The relationship between confidence in community-relevant activities and reported community participation behaviors showed that respondents reporting participation in these 10 community-based activities had significantly higher mean factor community practice dimension scores. In the case of Factors 3 and 4, mean confidence scores were significantly higher for all 10 activities.

Table 3 shows results derived from regressing variables that had reached significance in the bivariate analyses on respondents' reported confidence level in each of the four community-related factors. Notably, currently practicing in an underserved community was statistically significant only with the factor reflecting confidence in attending to sociocultural aspects of care.



Table 3

Correlates of Physicians' Reported Confidence in Each of the Four Community Dimensions of Medical Practice: Results (Beta Coefficients) From Linear Regression

	<i>Four Community Dimensions of Medical Practice</i>			
	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>
	Sociocultural Aspects of Care	Use of Community Health Resources	COPC	Community Participation and Assimilation
Race				
White (1)				
Other (0)	-.193**	—	—	—
Gender				
Male (1)				
Female (2)	—	—	-.163**	—
Current practice				
Underserved (1)				
Not underserved (0)	.170**	—	—	—
Interested in being part of community when starting residency	-.156*	—	—	—
Interested in cultural aspects of patient care when starting residency	.201**	.207***	.208**	—
Years out of residency	—	-.166**	—	—
Interest in working directly with community members outside office when starting residency	—	—	.159*	.341***
Model F value	7.933***	7.415***	8.846***	18.144***

\*  $P \leq .05$

\*\*  $P \leq .01$

\*\*\*  $P \leq .001$

Decade of graduation was associated only with use of community health resources, with the earlier graduating cohort more likely to express confidence in using these resources. The association between interest in being part of the community as residency began and confidence in sociocultural aspects of care was negative, indicating that these graduates had little confidence in their knowledge of communities' identities, customs, and culturally related health issues. Graduates interested in working directly with community members as their residency began indicated confidence in the two community dimensions of practice, reflecting a need for physicians to "step out of their offices and into the neighborhoods where their patients live and work" as well as for their contributions to "extend beyond what they give through their care to individual patients, and even through their participation in the community-based health initiatives of COPC."<sup>1</sup>

#### *Practice in HPSAs*

Three quarters (74.8%) of all respondents reported that neither their initial nor current practices were in HPSAs. Ten percent reported the obverse, ie, their initial as well as current practices were characterized as a HPSA. As shown in Table 4, a higher proportion

of more recent graduates compared to graduates from 1986–1995 and 1976–1985 stated that their initial and current practices were in a HPSA area (13.6%, 10.0%, and 5.6%, respectively). The association between decade of graduation and initial versus current practice in a HPSA site was not statistically significant, however. Respondents whose initial practice was in a HPSA and who gave a reason for leaving the HPSA site to work in a non-HPSA identified issues apparently unrelated to practice, such as to be near parents, pursue additional training, and spousal opportunities, as well as issues reflecting the practice environment, including poor reimbursement, amount of paperwork, and level of stress.

#### **Discussion**

Respondents' self-reported confidence in a range of community-relevant activities was significantly associated with behaviors related to community participation. Members of the earliest graduating cohort were more likely to be involved in community-related activities. More recent graduates, however, were less likely to be involved in such activities, even though they were more likely to report having been trained in community-related issues and to have had contact with community-

active physicians while in medical school.

These findings raise questions related to why more recent graduates—who reported more pre-doctoral training in community skills, possibly reflecting changes over time in medical school curricula,<sup>11-15</sup>—aren't more likely to report using those skills. It may be that newly minted physicians feel a need to focus on solidifying their clinical skills before engaging in community activities that take them beyond their office walls.

For educators, the implications of this finding are that we need to determine how and to what extent community skills training during medical school can be reinforced and extended through residency so that young physicians may engage with their communities earlier in their careers. This might be accomplished through stronger physician roles that can demonstrate how to weave community activities into practice. This would allow students and residents not simply to be taught about community engagement skills—they would see physicians actively applying them as well.

With the composition of the medical student body shifting to approximately 50% female<sup>16</sup> and the study's male physicians reporting greater confidence in one of the dimensions of community practice reflecting a high level of community involvement and activity, our work has several implications for community involvement. Research has shown that high-achieving women are more likely than high-achieving men to report "impostor feelings."<sup>17</sup> While our study results may simply reflect the greater hesitancy that women feel in expressing their confidence to perform certain activities, self-efficacy can reflect an individual's past accomplishments and has been shown to predict future performance and perseverance.<sup>1</sup> Educators will need to capitalize on initial interest levels, provide mentors and role models, and ensure clear avenues through which young physicians, particularly female physicians, can engage in activities reflecting real partnerships with communities and that boost confidence in their ability to take proactive steps to improve community health.

Given family medicine's commitment to train physicians to practice in HPSAs, it is surprising that three quarters of graduates reported neither initial nor current practices were/are in underserved areas. Smaller percentages in each cohort reported current HPSA than

Table 4

Health Professions Shortage Areas (HPSAs):  
Respondents' Initial and Current Practice Sites

Graduation Decade	Initial and Current Practice HPSA Versus Non-HPSA by Decade of Residency Graduation (n=262)			
	HPSA Initial and Current n (%)	HPSA Neither Initial nor Current n (%)	HPSA Initial; Current Non-HPSA n (%)	HPSA Current; Initial Non-HPSA n (%)
1976–1985* (n=72)	4 (5.6)	57 (79.2)	8 (11.1)	3 (4.2)
1986–1995** (n=80)	8 (10.0)	57 (71.3)	11 (13.8)	4 (5.0)
1996–2005** (n=110)	15 (13.6)	82 (74.5)	8 (7.3)	5 (4.5)
Total	27 (10.3)	196 (74.8)	27 (10.3)	12 (4.6)

\*  $P < .01$

\*\*  $P < .001$

initial HPSA practice, thus reinforcing the need to emphasize retention efforts. With the country experiencing a shortage of primary care physicians, particularly in underserved areas,<sup>18</sup> these attrition rates are concerning. The benefits of retention that include direct replacement costs and longer practicing physicians' greater community involvement as well as indirect costs of interrupted continuity make extending the length of time that a physician remains at a HPSA site a compelling goal. This is particularly important in light of the fact that few physicians in any of the graduating cohorts reported having had an initial practice in an area that was not underserved and then moving to one that was.

#### Limitations

This study has several limitations. First, respondents' practice sites were self-defined as HPSA or non-HPSA; we did not verify the actual categorization of practice sites. Additionally, data related to perceptions of community involvement were also self-reported and could be influenced by social desirability.

Third, the study included only graduates from one residency program, so the results may not generalize to all programs. Nevertheless, our factor analysis mirrored results of a broad study that included respondents from across the country. This lends credence to our findings, so we believe they are valid.

Fourth, we relied on self-report. We did not attempt to determine respondents' degree of community involvement in each domain, nor did we separate out the impact of community skills training that occurred in the classroom versus the community itself.

#### Conclusions

Our findings demonstrate that family physician involvement in community-related activities increases



with years beyond residency graduation. With more recent graduates reporting that they learned community-related skills while in medical school, effectively reinforcing these skills during residency could mean that in the future, physicians may be involved in community activities at an earlier juncture in their careers. Our communities as well as the profession could be well served if residencies capitalize on physicians' interest in community involvement as they begin residency.

This study also provides evidence that family physicians are electing to practice in HPSAs but that over time, many physicians leave these areas. Communities lose not only the physicians' clinical expertise but also their likelihood of greater community engagement as they mature.

*Acknowledgments:* The authors express their appreciation to Linda Cragin and Joanne Dombrowski of the Massachusetts Area Health Education Network for their help in developing the survey and entering the data into a database. Data from this study were presented at the 2007 Society of Teachers of Family Medicine Annual Spring Conference in Chicago.

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#### REFERENCES

1. Pathman DE, Steiner BD, Williams E, Riggins T. The four community dimensions of primary care practice. *J Fam Pract* 1998;46(4):293-303.
2. Brill J, Ohly S, Stearns M. Training community-responsive physicians. *Acad Med* 2002;77(7):747.
3. Goldstein A, Calleson D, Curtis P, et al. Community service by North Carolina family physicians. *J Am Board Fam Med* 2005;18:48-56.
4. Gruen RL, Campbell EG, Blumenthal D. Public roles of US physicians: community participation, political involvement, and collective advocacy. *JAMA* 2006;296(20):2467-75.
5. Plescia M, Konen J, Lincourt A. The state of community medicine training in family practice residency programs. *Fam Med* 2002;34(3):177-82.
6. Reid S, Mantanga L, Nkabinde C, Mglongo N, Mankahia N. The community involvement of nursing and medical practitioners in KwaZulu-Natal. *SA Fam Pract* 2006;48(8):16.
7. Bucholtz JR, Matheny SC, Pugno PA, David A, Bliss EB, Korin EC. Task Force Report 2. Report of the Task Force on Medical Education. *Ann Fam Med* 2004;2(suppl 1):S51-S64.
8. Candib LM, Gelberg L. How will family physicians care for the patient in the context of family and community? *Fam Med* 2001;33(4):298-310.
9. Ringdahl E, Delzell JE Jr, Kruse RL. Changing practice patterns of family medicine graduates: a comparison of alumni surveys from 1998 to 2004. *J Am Board Fam Med* 2006;19(4):404-12.
10. Dillman D. Mail and Internet surveys: the Tailored Design Method, second edition. New York: John Wiley & Sons, Inc, 2000.
11. DeHaven M, Gimpel N. Reaching out to those in need: the case for community health science. *J Am Board Fam Med* 2007;20:527-32.
12. Irby D, Wilkerson L. Educational innovations in academic medicine and environmental trends. *J Gen Intern Med* 2003;18:370-6.
13. Ko M, Heslin K, Edelstein R, Grumbach K. The role of medical education in reducing health care disparities: the first 10 years of the UCLA/Drew Medical Education Program. *Soc Gen Intern Med* 2007;22:625-31.
14. Loeser H, O'Sullivan P, Irby D. Leadership lessons from curricular change at the University of California, San Francisco, School of Medicine. *Acad Med* 2007;82:324-30.
15. Sefton A. New approaches to medical education: an international perspective. *Med Princ Pract* 2004;13(5):239-48.
16. Association of American Medical Colleges. US medical school applicants and students 1982-83 to 2006-07. Association of American Medical Colleges, 2007:5.
17. Henning K, Ey S, Shaw D. Perfectionism, the imposter phenomenon and psychological adjustment in medical, dental, nursing, and pharmacy students. *Med Educ* 1998;32(5):456-64.
18. Lee C. Community health clinics flourish, but doctors are few. *Washington Post* 2007. [http://www.washingtonpost.com/wp-dyn/content/article/2007/06/18/AR2007061801368\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2007/06/18/AR2007061801368_pf.html). Accessed July 2, 2007.