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# The Physicians' Giving Back Survey: Keeping up with American generosity

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## Abstract

**Background:** America scored at the top of the World Giving Index survey in 2014. This paper reports on a survey among US physicians about preferences for and prevalence of pro-bono activities devoted to health-related direct medical services and medical teaching. Profiles related to these preferences are described.

**Methods:** An online survey solicited information on physician participation in selected charitable and volunteer activities. The responses were descriptively tabulated and multivariate regressions were performed to identify associations between the activities and demographic and professional features.

**Results:** Six hundred one qualified respondents (0.62 % response rate) indicated participation in one or more pro-bono activities. Seventy-two percent performed activities domestically and 32 % provided services abroad in lower and middle income countries. Uncompensated medical teaching (54 %) was the most common activity followed by waiving fees in their practices (39 %). No clear profile emerged that predicts a subset of physicians likely to perform a particular activity.

**Conclusions:** Unpaid teaching and direct pro-bono services reflect the medical profession's contribution to American generosity. Amounts of fees waived in practice and engagement in volunteer activities have kept pace with historic benchmarks in support of unmet needs for these social goods. Participation in pro-bono activities appears broad and not the selective domain of particular physician subsets.

**Keywords:** Health services research, Workforce, Underserved populations, Volunteerism

## Background

Americans are generous people according to the recently published World Giving Index [1]. In 2014, the United States was the singular country to be ranked in the top ten in all three key charitable giving behaviors: volunteering time, donating money and helping a stranger. The US shared the top ranking for overall giving with Myanmar and holds the top ranking for the 5 year giving index. Evidence suggests that the national giving behavior includes American doctors [2–4]. Grande and Armstrong utilized secondary data meticulously gleaned from the 2003 Current Population Survey (CPS) Volunteer Supplement to assess rates of physician volunteerism in certain broad areas of health-related and non-health related activities. At a 39 % general rate of volunteerism, characterization modeling found that married physicians working longer

hours in their Midwest practices were most likely to volunteer. A 3-year look-back reported by Gruen et al. in 2004 indicated a 54 % participation in providing health-related expertise to a community organization by American physicians [5]. Cunningham and May noted in 2006 that more than two-thirds of physicians provided some charitable medical services, three quarters of which was within their own practices [6]. The popular Medscape Physician Lifestyles Surveys between 2012 and 2015 echo that overall volunteerism by physicians runs around two-thirds [7–10].

US physicians nurture skill sets and capacities that avail them of a wide variety of opportunities for charitable activities. Beyond cash donations to charities, many provide free (“pro-bono”) medical care to the needy domestically and/or go abroad to give care to the poor in developing countries. By means of a short survey called the “Physicians' Giving Back Survey” (PGBS), we sought to quantify physician preferences for and prevalence of

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pro-bono activities and to see if profiles would emerge related to these preferences. Our survey questions focused on physician time and philanthropy devoted to health-related direct medical services and medical teaching rather than involvement in non-health-related domains such as religious or civic organizations, hence the notion of “giving back” to the profession and society that has provided physicians in the US a desirable income and intrinsic respect. The importance of quantifying physician preferences and correlating physician characteristics related to those preferences lies in establishing a foundation for further assessment of physician involvement in the discrete categories for pro-bono activities by physicians. Such a foundation may be relevant to training, professional development and policy recommendations that could have a downstream influence on the allocation of the scarce resources of physician skills and time more efficiently to the benefit of the healing profession and society as a whole. In exploring for physician types associated with the discrete activities, we elected to cast a wide net touching on the native, acquired, geographic and professional demographics as grouped in the stable and dynamic domains described in our results.

## Methods

The PGBS was conducted as a brief online survey. Beta testing of the PGBS was performed utilizing a selected group of 15 identified physicians whose critiques were incorporated into the final PGBS version. Exempt status was granted for use of human subjects for the survey from the Investigational Review Board of Midwestern University Office of Research and Sponsored Programs, Downers Grove, Illinois, USA. The survey was implemented through SurveyMonkey®. Deployment of the survey to 109,237 unique physician emails was executed between January 30 and February 27, 2014. Response reception was closed on 30 April 2014. The email list included only physicians who were licensed to conduct the full spectrum of medicine (US MD, IMG, and DO)<sup>1</sup>. The survey targeted 93 % MDs/IMGs and 7 % DOs, proportionate to the US physician population distribution as provided in the American Medical Association (AMA) 2011 Physician Master File (data as of Dec. 31, 2010). The survey was disseminated equally to the four regions of the US<sup>2</sup> in close proportion to the specialties practiced by the US physician population [11]. The proprietary postal database of Healthcare Data Solutions (HDS) was used. The HDS database conforms to industry best practice guidelines for business-to-business email acquisition, adheres to US CAN-SPAM guidelines and maintains a quarterly “permissioning” and validation process. HDS’s DirectSelect tool herein eliminated titles such as Doctor of Chiropractic, Doctor of Optometry,

Doctor of Podiatric Medicine, Licensed Acupuncturist, Naturopathic Doctor, dentists and PhDs.

The first question of the survey screened for a target sample of physicians that had completed all formal training and are or had been in practice in the US, followed by questions to capture participation in a variety of activities related to physician skills including teaching and various settings of teaching, direct patient services and various settings of care, pro-bono time spent on professional and patient support organizations, donations and “other”. If participation in short-term medical missions abroad was indicated, the respondent was then shunted to additional questions regarding this activity. Demographic and professional characteristics of respondents were solicited at the close of the survey. Table 1 displays the core questions of the survey regarding philanthropic and volunteer activities and subtypes of direct medical care and teaching options.

For the statistical analysis, the Statistical Package for the Social Sciences (SPSS) version 22 was utilized in the chi<sup>2</sup> test comparisons of sample and population characteristics. The social studies proprietary statistical software STATA version 12 (College Station, TX) was utilized for statistical correlations and multivariate regressions. Regression models and explanatory variables were considered significant at P values of 0.05.

## Results

### Sample characteristics

Six hundred one physicians who had completed all training and were or had been in practice in the US responded to the PGBS. Table 2 provides a comparison of the sample and the physician population of the US showing statistical similarity with respect to race, civil status, type of medical degree and region of the country and dissimilarity with respect to gender, age, IMG status and religion (chi<sup>2</sup> test). The top 16 of 29 specialties of respondents was visually similar in rank order to the population (Table 3) [11].

More than half of practicing physicians provided some unpaid teaching to medical students, ancillary personnel or the public (Table 1). Unpaid teaching efforts for medical personnel were nearly equal in regards to inpatient and outpatient settings.

The next most common charitable activity among respondents after teaching activities was the implementation of a system in the physician’s practice to accommodate those who have limited ability to pay. Respondents estimated the amount waived in the preceding year by choosing among a set of ranges. Extrapolating a weighted mean from the midpoints in these ranges and number of observations in each range, an estimated annual mean amount waived was \$22,583 (observations 241; range 0–\$50,000; SD \$18,828; median \$12,500). Using the proportion of our

**Table 1** Choices of charitable or volunteer activities (N = 601)

	Percent of respondents
Pro-bono medical teaching	54 %
There is a system in my practice to accommodate those who have limited ability to pay.	39 %
Pro-bono direct medical services provided in local and domestic clinics or outreaches	38 %
Giving money or donations in kind to charitable organizations	37 %
Pro-bono direct medical services in developing countries	32 %
Giving time devoted to the organized activities of patient support organizations	26 %
I am not yet in a position to participate in any volunteer activity or giving.	13 %
No such activities so far since I have been in medical practice	2 %
<b>Sub-types of pro-bono teaching activities (N = 601)</b>	<b>Percent of respondents</b>
Teaching of medical students, residents, fellows, nurses or ancillary service personnel - Office/outpatient setting.	53 %
Teaching of medical students, residents, fellows, nurses or ancillary service personnel - Hospital/inpatient setting.	55 %
Health-related teaching to civic organizations or general public	40 %
Health-related teaching to public or private schools	28 %
No pro-bono teaching activities	8.32
<b>Sub-types of domestic pro-bono direct medical services (N = 601)</b>	<b>Percent of respondents</b>
Other domestic pro-bono medical services	31 %
No pro-bono direct medical services	28 %
Unpaid screening physicals, team or group doctor for schools or organizations	23 %
Local free/sliding scale clinic after usual practice hours	17 %
Domestic short-term mission work for which I must schedule time away from my practice	9 %
Local/domestic disaster response wherein I provide free medical services	9 %

sample that reported waiving fees, the mean amount waived and the size of the US physician population in 2013 [12], our estimate of the total uncompensated care in such practices is \$7.3 billion in that year [ $\$22,583 \times (39 \% \times 829,962)$ ] or 1.24 % of total health care spending on physician care [13].

Of the 72 % of respondents who provided uncompensated direct medical services domestically, the more common settings involved the provision of free screening physical exams and/or acting as team physician to schools or other organizations and practicing at free or sliding scale payment clinics. Far less common were domestic short term missions or disaster relief (Table 1).

Thirty-two percent of respondents had provided direct care to recipients in low-and-middle-income country (LMIC)<sup>3</sup> recipients in the form of planned, short term medical missions (STMMs). Of those, 77 % had repeated the activity. Table 4 illustrates the countries by region and cumulative mission count by PGBS respondents.

Twenty-six percent of physicians had devoted time to the organized activities of patient support organizations such as the Arthritis Foundation and American Cancer Society. Among other choices, several respondents indicated volunteer time with professional organizations and

hospital committees. Novel, non-health related activities cited by physicians included urban search and rescue, volunteer policing, animal rescue and anti-cruelty activities, judging at student science fairs, playing music and organizing sports events for charities. No respondents indicated the choice not to participate in any charitable or volunteer activities, although 4 % indicated not yet being in a position to participate or not having participated “so far” since starting medical practice. Curiously, these “potential” participants were found across the range of years in practice and age groups of respondents and not confined to new-comers to practice.

#### Who does what?

Participation totals exceeded 100 % of the sample for the general categories of charitable and volunteer activities and the subtypes of teaching and direct medical services, which indicates that many physicians participated in more than one activity. However, no single category statistically correlated with any other single activity to reveal a pattern of related activities (Table 5). For teaching subcategories, a moderate correlation exists between pro-bono teaching to civic organizations/general public and teaching in public/private schools (coefficient 0.46).

**Table 2** Demographic comparison of PGBS respondents (sample) to us physician population

	PGBS respondents (501)	US physicians [12] (828,869)	Similarity to population Significance $p < 0.05$ , 95 % CI
<b>Gender</b>			
Male	57.7 % (289)	67.4 % (558,794)	$P = 0.05$
Female	42.3 % (212)	32.6 % (270,075)	
<b>Medical degree</b>	<b>PGBS respondents (501)</b>	<b>US physicians [12] (828,914)</b>	
MD	94.4 % (473)	91.6 % (760,341)	$^cP = 0.125$
DO	5.6 % (28)	7.3 % (60,172)	
<b>Age group</b>	<b>PGBS respondents (501)</b>	<b>US physicians [12] (828,318)</b>	
Age 55 or >	57.6 % (289)	42.6 % (349,248)	$P = 0.000$
Age <55	42.3 % (212)	57.4 % (479,070)	
<b>Source of medical degree</b>	<b>PGBS respondents (501)</b>	<b>US physicians [12] (829,914)</b>	
MD-US/Canada/PR <sup>a</sup>	76 % (379)	67.4 % (559,731)	$P = 0.000$
MD-IMG	19 % (94)	24.2 % (200,610)	
DO	6 % (28)	7.3 % (60,172)	
<b>Race/Ethnicity</b>	<b>PGBS respondents (520)</b>	<b>US physicians [20]</b>	
White	82 % (408)	73.7 %	$^cP = 0.122$
Black or African American	2.82 % (14)	3.8 %	
Hispanic	3.83 % (23)	5.3 %	
Asian or other	15.9 % (75)	17.2 %	
<b>Religion</b>	<b>PGBS respondents (477)</b>	<b>US physicians [21] (1125)</b>	
Christian <sup>b</sup>	48.6 % (232)	64.4 % (710)	$P = 0.000$
Jewish	19.1 % (91)	14.1 % (181)	
Hindu	2.1 % (10)	5.3 % (53)	
Muslim	1.9 % (9)	2.7 % (33)	
Buddhist	2.1 % (10)	1.2 % (13)	
Other	4.8 % (23)	1.8 % (18)	
None	21.4 % (102)	10.6 % (117)	
<b>US Region</b>	<b>PGBS respondents (601)</b>	<b>US physicians [20]</b>	
Northeast	27.3 % (164)	23 %	$P = 0.000$
South	15.0 % (90)	32.5 %	
Midwest	18.0 % (108)	22.4 %	
West	21.7 % (130)	22.1 %	
<b>Married</b>	<b>PGBS respondents (488)</b>	<b>US physicians [9]</b>	
Yes	80.5 % (393)	81 %	$^cP = 0.705$
No	19.5 % (95)	19 %	

<sup>a</sup>Puerto Rico (US territory)

<sup>b</sup>Catholic, Protestant, Eastern Orthodox, Mormon

<sup>c</sup>no statistically significant difference (chi2 test, SPSS)

Statistical correlations did not reveal any pattern among varieties of direct care services, domestic or abroad.

Using each of the general activities and subtypes in Table 1 as binary dependent variables, multivariate regressions controlled for 16 explanatory variables that can be conceptually aggregated into two domains. The first domain consists of typically stable demographic characteristics including gender, race, Hispanic ethnicity, religious

affiliation, degree (MD/DO), being born in the US, having completed medical school in the US, specialty and income level. The second domain includes those characteristics that commonly change over time including region of the US, civil status, children in the home, city population size, cumulative years in practice and practice situation (solo practice, academic, hospital-based, government or public facility, multi-specialty group,

**Table 3** Comparison of rank order of specialties of PGBS respondents and US physician population

	Rank order of specialties of PGBS respondents	Rank order of US specialties [12] <sup>a</sup>
1	Family medicine	Internal medicine
2	Internal medicine	Family medicine
3	Pediatrics	Pediatrics
4	Anesthesiology	Obstetrics and Gynecology
5	General surgery	Anesthesiology
6	Psychiatry	Psychiatry
7	Obstetrics and Gynecology	Emergency medicine
8	Emergency medicine	Radiology
9	Orthopedics	General surgery
10	Cardiovascular	Cardiovascular
11	Radiology	Orthopedics
12	Pathology	Ophthalmology
13	Neurology	Hematology/Oncology
14	Ophthalmology	Pathology
15	Hematology/Oncology	Gastroenterology
16	Gastroenterology	Neurology

<sup>a</sup>2014 Physician Specialty Data Book [12]

single-specialty group) and age group. Ages of respondents were re-coded into groupings of 25–39, 40–55 and 56–73 years. Civil status was simplified to those who were legally married or not. For the analysis, specialties were aggregated into four broad categories including adult cognitive medicine, pediatric cognitive medicine, surgery and anesthesia, and other respondent specialties (psychiatry, pathology, radiology, nuclear medicine, dermatology, pain medicine). Models were considered significant if a  $\text{Prob} > \chi^2$  of at least 0.05 was demonstrated.

Pro-bono performance of school physicals or team medical coverage was more associated with southern, midwestern and western regions than the northeast and with attending medical school in the US. Specialty category linked pediatric cognitive medicine, surgical and anesthesiology specialists with short-term medical missions abroad, while adult cognitive clinicians were more likely to provide services in free and sliding scale clinics than surgeons or pediatricians. Being of Christian affiliation was more influential than having no religious affiliation on inpatient and community teaching, but not more than other religious affiliations. For the statistically significant models, significant independent variables were found that were different among models without clustering. None of the types or sub-types of charitable or volunteer activities could be predicted by a robust model consisting of more than two of the 16 solicited demographic or professional features in either of the two domains.

## Discussion

The PGBS suggests that charitable and volunteer participation in health-related activities remains broadly prevalent among US physicians and is not the domain of any subset of the physician demographic dimensions we addressed. Little influence from religion as the survey's sole indicator of belief structure is seen; rather, one might speculate that the influence of oath substitutes as the locus of decision-making in this societal arena. The mitigation of access to care for the underserved and propagation of knowledge by physicians continues as an undercurrent to the nation's healthcare administrative evolution.

A couple of the observed explanatory characteristics of participation in some of the activities appear somewhat intuitive. The procedurally focused specialties of surgery and anesthesiology may provide effective, discrete contributions to individual health in a short-term medical mission setting abroad. The internist, by contrast, may be able to provide some continuity of care at the domestic free clinic, but less so abroad. Overall, however, our regressions fail to project a fleshed-out portrait or even a Gestalt image of the particular type of physician performing a particular "giving-back" task. The lack of defining profile is likely less attributable to a modest response rate or the selection of variables than to the integration of fully-trained physicians into the flow of modern medical care and education with its encompassing traditions and regulatory environment. In this regard, peer influence may supersede the influence of the personal traits employed in our regression models on the propensity for philanthropy, pro-bono work and teaching.

Hadley and Holahan estimated in 2001 dollars that uncompensated care to uninsured persons provided by physicians, excluding those salaried by hospitals and clinics, may reach \$5.1 billion annually. Our estimate at \$7.3 billion in 2014 dollars could be said to keep pace with that earlier estimate despite the changes bought forward by managed care and more recently the Patient Protection and Affordable Care Act (PPACA) enacted in 2010 [6].

Contemporarily with the latest World Giving Report, our brief online survey sought cumulative, primary data on specific types of volunteering associated with services for which a fully trained and licensed physician would typically be qualified. Although our survey did not specifically address the third aspect of the giving trilogy of the Report, the proximate exchange taking place in pro-bono medical services renders the dimension of "helping a stranger" integral to this type of volunteering. The popular Medscape Physician Lifestyles Surveys between 2012 and 2015 suggest that overall volunteerism by physicians runs around two-thirds and that not ever

**Table 4** Countries by region and mission count by PGBS respondents

Latin America		Africa		Eastern Europe		Middle East	
Argentina	3	Benin	1	Armenia	6	Iraq	2
Belize	2	Burundi	1	Azerbaijan	1	Kuwait	1
Bolivia	20	Cameroon	2	Bosnia-Herzegovina	1	Palestinian Territory	3
Brazil	6	Chad	1	Bulgaria	1	Saudi Arabia	1
Chile	6	Congo	1	Croatia	3	Syrian Arab Republic	4
Colombia	15	Cote' D'Ivoire	1	Cyprus	1	Turkey	1
Costa Rica	4	Egypt	4	Moldova	1	<b>Central Asia</b>	
Cuba	3	Ethiopia	11	Poland	1	Afghanistan	4
Dominican Republic	39	Ghana	13	Romania	4	Kazakhstan	1
Ecuador	41	Kenya	31	Russian Federation	3	Mongolia	4
El Salvador	23	Liberia	2	Ukraine	1	Pakistan	1
Grenada	2	Malawi	5	<b>Pacific Islands</b>		<b>Southeast Asia</b>	
Guatemala	66	Mali	1	Fiji	11	Cambodia	5
Guyana	2	Niger	1	Marshall Islands	2	China	12
Haiti	105	Nigeria	10	Micronesia	1	Indonesia	6
Honduras	54	Rwanda	7	Papua New Guinea	1	Japan	1
Jamaica	20	Sierra Leone	4	Solomon Islands	1	Malaysia	1
Mexico	58	South Africa	8	Togo	1	Philippines	37
Nicaragua	28	Sudan	1	Turks/Caicos Islands	5	Thailand	6
Panama	6	Swaziland	2			Vietnam	30
Paraguay	1	Tanzania	7			<b>Indian subcontinent</b>	
Peru	37	Uganda	7			Bangladesh	6
Puerto Rico	1	Zambia	3			India	55
Saint Lucia	4	Zimbabwe	5			Nepal	7
Suriname	1					Pakistan	8
Venezuela	5					Sri Lanka	4

**Table 5** Inter-correlation of pro-bono physician activities

	Give money/ donations in kind	Pro-bono teaching	Pro-bono domestic direct medical services	Provide time for activities of patient support organizations	Mechanism in practice for accommodating those with limited means to pay	Pro-bono direct services in low and middle income countries
Give money/donations in kind	1.0000					
Pro-bono teaching	0.2146	1.0000				
Pro-bono domestic direct medical services	0.1908	0.2624	1.0000			
Provide time for activities of patient support organizations	0.2318	0.2318	0.1385	1.0000		
Mechanism in practice for accommodating those with limited means to pay	0.1937	0.2009	0.1619	0.1158	1.0000	
Pro-bono direct services in low and middle income countries	0.0910	0.1087	0.1531	0.0610	-0.0394	1.0000

volunteering correlates with higher rates of physician burn-out [7–10]. While physicians working in managed care may provide less charity care, it is not apparent that that feature of change in the landscape of US healthcare delivery has had any profound effect on physician volunteerism in the new millennium [14]. In this sense, the payback to physicians for their time and money may extend beyond “warm glow” motivation to an additional variety of investment exchange motivation, that being sustainability of interest in a challenging profession [15]. Cunningham and May expressed concerns over diminishing contributions of charitable medical care by physicians in providing a safety net to some 40 million Americans without insurance prior to the PPACA [6]. Among the reasons cited for such decline at the time were the greater demands on physician schedules in managed care and institutional medicine. How the roll out of the PPACA will influence this dynamic of charitable care through the reduction of population previously excluded from access to regular care remains to be seen.

Roy and Zeimak have lucidly reviewed the maturation of the study of motivation for volunteerism and charitable giving that has culminated into three separable though not exclusive theoretical models: a. Public goods, wherein the benefit objective is altruistic, i.e., to increase the supply of a public good, b. Private consumption, wherein the benefit objective is found in the utility of “warm glow”, self-value, and joy from the act of volunteering or philanthropy, and c. Investment Exchange, wherein the benefit sought by the giver is experience, personal market value, skills, and contacts [15, 16]. Of most relevance to the recipients of physician care is the first model, since health care, like the arts, education, scientific research and similar public goods, are sensitive to market failures that are mitigated through government funding and/or non-profit organizations. Others have continued to examine how this dynamic first characterized by Becker is influenced by concurrent political and economic circumstances and the applicability of this model to these susceptible sectors [17–19]. It seems unlikely that the busy physician checks his or her motivation against these advanced theories as it would seem wholly consistent to chase sickness beyond the requirement of making a living. The caring, professional and teaching obligations codified in their respective medical oaths should be well enough imbued by the end of training. Thus the rates of volunteering seen in health-related functions would be expected regardless of theoretical basis.

Survey data collection remains challenging despite the ability to instantaneously deliver an instrument to considerably large subsets of a population through email or websites. Our response “click through” rate of 0.62 % approximated typical response rates to email

surveys propagated from the proprietary HDS database (January 2014: 25th percentile 0.17, 75th percentile 0.72) (personal communication). Providing an opportunity to physicians to boast about their volunteerism did not apparently advantage our response rate beyond typical modest returns. Additionally, although we controlled the survey distribution to a representative cohort with respect to region, specialty and medical degree type, the respondent sample significantly correlated with US physician population only partially, i.e., with respect to race, civil status, type of medical degree and region of the country and not with respect to gender, age, IMG status and religion, rendering the external validity of the sample open to question. The data analysis presented does not address incidence of volunteer participation, hours devoted nor dollar amounts donated. No attempt to mitigate the effects of internal migration, change in civil status, practice situation or religion on the regressions was made. Though consonant with estimations from prior cited research, we recommend an abundance of caution in the use of our estimations of waived fees in view of the composite limitations of the value of survey data in general and ours in particular, and encourage reconciliation with other sources of such figures as they may become available.

## Conclusions

“Giving back” to the profession through multifaceted unpaid teaching and to society through direct pro-bono services remains a quantifiable reflection of medical professionals’ contribution in line with American generosity. Amounts of fees waived in practice and engagement in volunteer activities have kept pace with historic benchmarks. Participation in pro-bono activities appears broad and not the domain of a particular demographic or professional subset or subsets of physicians. We suggest that an oath-driven response to a deficit of a domestic public good may be the nidus of motivation in these giving-back activities domestically. Further exploration of the dimensions of inputs and motivation for pro-bono activities abroad may be warranted.

## Endnotes

<sup>1</sup>“US MD” refers to physicians who received their Doctor of Medicine degree from a U.S. allopathic medical school. “DO” refers to physicians who received a Doctor of Osteopathy degree from a US-sanctioned osteopathic medical school. International medical graduate (IMG) refers to an individual with an MD or equivalent degree who graduated from a medical school outside the United States and its territories or Canada, including U.S. citizens who have attended such medical schools abroad. To be eligible for licensure and practice in the United States, all IMGs must have completed accredited graduate training in the United States.

<sup>2</sup>The Northeast includes nine states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York and Pennsylvania; the Midwest region includes 12 states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin; the Southern region includes sixteen states: Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Delaware, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma and Texas; the Western region of the United States includes 13 states: Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, Nevada, Washington, Oregon California, Alaska and Hawaii.

<sup>3</sup>World Bank list of economies, February 2014, [sources.worldbank.org/DATASTATISTICS/Resources/CLASS.XLS](http://sources.worldbank.org/DATASTATISTICS/Resources/CLASS.XLS)

#### Competing interests

The authors declare that they have no competing interests.

#### Authors' contributions

PC provided the initial survey questions, portions of the statistical analysis and initial manuscript draft. AI contributed to survey design revisions, oversaw the Investigational Review Board interaction to obtain Exempt Status with each survey and survey plan revision, and provided critical revisions to the manuscript. MP provided direction and direct contribution in the statistical analysis of the survey data and technical input into wording in the manuscript. WG provided input into the general direction of the data analysis, clarification of study objectives and critical review of the manuscript. All authors read and approved the final manuscript.

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