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Physicians' Perceptions Of People With Disability And Their Health Care

ABSTRACT More than sixty-one million Americans have disabilities, and increasing evidence documents that they experience health care disparities. Although many factors likely contribute to these disparities, one little-studied but potential cause involves physicians' perceptions of people with disability. In our survey of 714 practicing US physicians nationwide, 82.4 percent reported that people with significant disability have worse quality of life than nondisabled people. Only 40.7 percent of physicians were very confident about their ability to provide the same quality of care to patients with disability, just 56.5 percent strongly agreed that they welcomed patients with disability into their practices, and 18.1 percent strongly agreed that the health care system often treats these patients unfairly. More than thirty years after the Americans with Disabilities Act of 1990 was enacted, these findings about physicians' perceptions of this population raise questions about ensuring equitable care to people with disability. Potentially biased views among physicians could contribute to persistent health care disparities affecting people with disability.

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Released in 2000, *Healthy People 2010* was the first of the decennial reports produced by the Department of Health and Human Services (HHS) delineating national public health priorities to identify people with disability as experiencing health care disparities, partially attributing these inequities to common misconceptions about this population.[1] During the past two decades increasing evidence has documented persistent disparities for people with disability, now including more than sixty-one million Americans[2]—numbers that will grow in coming years with the aging population. Disparities exist in screening and preventive services,[3,4] cancer diagnosis and treatment,[5,6] reproductive and pregnancy care,[7,8] communication with health care professionals,[9,10] and satisfaction with care.[11] Many patient-level factors likely contribute to these disparities, such as patients' complex underlying health conditions,[12] disadvantages in social determinants of health,[13,14] and patients' preferences for care.[6,11] Systems-level factors also contribute, including inadequate training of health care professionals,[15,16] ineffective communication accommodations,[9,10,17] physical access barriers,[18,19] and inadequate knowledge among physicians about legal requirements to provide equitable care under the Americans with Disabilities Act (ADA) of 1990.[18,20] Despite it being more than thirty years since the enactment of this landmark civil rights legislation for people with disability, this population continues to experience inequitable health care on many levels.

One concern that has received relatively little empirical attention is the attitudes of physicians and specifically whether physicians have implicit or explicit biased views of people with disability. Over centuries, societies have stigmatized peo-

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ple with disability,[21] although the nature of these negative perceptions varies by disability type (for example, people with intellectual disability or serious mental illness are typically more marginalized than people with other types of disabilities). Limited research suggests that physicians can share these societal prejudices toward people with disability.[22,23]

A systematic review of studies investigating racial/ethnic implicit bias among physicians found that unconscious beliefs significantly affect treatment decisions, patients' outcomes, and other aspects of care.[24] If parallel effects hold for people with disability, physicians' bias toward disability could contribute to health care disparities. We are unaware of other studies of how US physicians, nationally and across specialties, perceive people with disability and whether they welcome them as patients. Better understanding of physicians' perceptions could inform efforts to improve the quality of care and achieve equity for this large and growing population. To advance this understanding, we developed and conducted a survey of US physicians to elicit their perceptions of people with disability and their care.

Study Data And Methods

The Massachusetts General Hospital/Partners HealthCare and University of Massachusetts Boston Institutional Review Boards approved this study.

SURVEY DEVELOPMENT AND TESTING No existing survey served our purposes. We therefore developed a single survey suitable for physicians serving adult patients and practicing in seven specialties: family medicine, general internal medicine, rheumatology, neurology, ophthalmology, orthopedic surgery, and obstetrics-gynecology (OB-GYN). We chose the first six specialties because of the likely high prevalence of people with disability in their patient panels. We included OB-GYN because many women see gynecologists for routine care, and prior research has found high rates of physical access barriers in OB-GYN practices.[18]

Survey design and testing involved several steps. First, we conducted twenty in-depth, open-ended individual interviews with physicians across the seven specialties who were practicing in Massachusetts to explore their experiences with caring for patients with disability.[17,20,25,26] Second, we conducted three videoconference focus groups with twenty-two practicing physicians in the selected specialties from seventeen states nationwide, identified through Sermo, an online social network of physicians.[27,28] Third, based on this qualitative research, we constructed the survey instrument in an iterative fashion. Trained interviewers at the Center for Survey Research, University of Massachusetts Boston, pretested the draft survey instrument with eight cognitive interviews with practicing physicians. The center formally pilot tested the revised survey with fifty subjects randomly selected from the sampling frame (see below). The final instrument included seventy-five questions grouped into eight modules, including five addressing specific disability types (mobility, vision, hearing, intellectual disability, and serious mental illness), physicians' responsibilities under the ADA and views about people with disability and their quality of care, practice characteristics, and participants' characteristics (for the survey instrument, see online appendix exhibit A1).[29] At the outset of each disability-specific module, we provided definitions of that disability type.

SAMPLING Using commercially available data from IQVIA, we identified all board-certified US physicians in the seven specialties ($n = 277{,}675$). From this list, we excluded physicians practicing in military or Veterans Affairs (VA) hospitals, all trainees (residents and fellows), locum tenens physicians, hospitalists, physicians with incomplete addresses or telephone numbers, and those board-certified in both medicine and pediatrics. These exclusions left 172,734 physicians in the sampling frame. Within each specialty, we selected simple random samples of physicians: 350 each in family practice and general internal medicine and 140 in each of the five specialties. This process yielded a total sample of 1,400 physicians (700 in primary care and 700 specialists). Because of budget constraints, we could not adequately power this survey to examine differences between each of the specialties.

SURVEY ADMINISTRATION The Center for Survey Research administered the surveys via priority mail in October 2019. It sent all sampled physicians a paper survey, recruitment cover letter, information sheet, postage-paid return envelope, and up-front cash honorarium of $50. The instructions asked respondents to complete the paper survey and return it in the postage-paid, addressed return envelope or to answer electronically using an individualized link provided in the mailing. Both the paper and electronic surveys contained a unique subject identification number, allowing the Center for Survey Research to conduct several follow-up calls and send additional mailings (without the cash incentive) to nonrespondents. The center began making reminder calls to all nonrespondents three weeks after the initial mailing, and it sent a second mailing to 552 nonrespondents in early January 2020. After again telephoning

Our study underscores that many physicians perceive worse quality of life for people with disability.

nonrespondents, the center sent a final mailing March 5, 2020. Logistical concerns caused by the coronavirus disease 2019 (COVID-19) pandemic extended the data collection; the center officially closed the survey in June 2020.

The survey's first page contained screening questions to confirm that the sampled physicians met eligibility criteria—that is, that they were board certified in one of the seven specialties, actively practiced in the US, and spent at least ten hours weekly in direct patient care. Of the 1,400 sampled physicians, 175 (12.5 percent) were deemed ineligible based on their screening question responses or because they were residents or fellows; were retired or had an inactive medical license; were too ill or deceased; were away from practice for the study duration; or had left the US or the Center for Survey Research could not reach them via mail, telephone, or internet. Of the 1,225 eligible physicians, 714 completed the survey. Of the respondents, 84.2 percent answered on paper surveys and 15.8 percent responded electronically. Using American Association of Public Opinion Research response rate number 3 for mailed surveys of specifically named persons, the weighted overall response rate was 61.0 percent.[30] Response rates by specialty were as follows: family medicine, 61.1 percent; general internal medicine, 63.2 percent; rheumatology, 57.7 percent; neurology, 58.0 percent; ophthalmology, 63.0 percent; orthopedic surgery, 58.6 percent; and OB-GYN, 61.6 percent.

OUTCOME AND PREDICTOR VARIABLES We asked physicians several questions to elucidate the factors underlying their perceptions of people with disability and their care. These questions addressed whether physicians welcome patients with disability into their practices, perceptions of fairness, the value of caring for patients with disability, confidence in caring for people with disability, and the quality of life of people with disability. Here we summarize specification of dichotomous outcome and predictor variables from survey questions (see appendix exhibit A for the survey instrument).[29]

▶ **FAIRNESS, UNDERSTANDING PATIENTS, WELCOMING PATIENTS:** A multi-item battery began with, "To what extent do you agree or disagree with the following statements…?" and then stated: "Understanding my patients with disability is valuable to me as a physician," "People with disability are often treated unfairly in the health care system," and "I welcome patients with disability into my practice." Response options were "strongly disagree," "somewhat disagree," "somewhat agree," and "strongly agree." We created dichotomous variables for these three items, treating "strongly agree" as the positive outcome and all other responses as the negative outcome.

▶ **QUALITY OF LIFE:** We asked, "In general, compared to persons without disability, do you believe the overall quality of life of persons with significant disability is…?," with response options being "a lot better," "a little better," "the same," "a little worse," and "a lot worse." For analysis, we grouped responses into a dichotomous variable, combining "a little worse" and "a lot worse" responses to identify participants who believe that people with significant disability have worse overall quality of life than people without disability.

▶ **CONFIDENCE ABOUT CARING FOR PEOPLE WITH DISABILITY:** We asked, "Overall, how confident are you in your ability to provide the same quality of care to patients with disability as you provide to patients without disability…?" with response options being "very," "somewhat," "not very," and "not at all" confident. For analysis, we created a dichotomous variable, with "very confident" representing a positive outcome and all other responses representing a negative outcome (that is, not very confident).

▶ **RACE/ETHNICITY:** Too few participants reported being Black or Hispanic for us to analyze these groups separately. We therefore combined them with people reporting "Other" race/ethnicity.

ANALYSES We performed all analyses using SAS, version 9.4, and considered two-sided $p < 0.05$ to be significant. We weighted the data to account for differences in the probability of selection and response rates within each specialty. The exhibits present unweighted *n*s, weighted percentages, and statistical significance. We assessed the significance of differences in the group distributions with two-sided chi-square tests. We obtained adjusted odds ratios and 95% confidence intervals from separate multivariable logistic regressions evaluating the relationship of the independent variables to the dichotomous outcomes defined above.

Our major outcome variable was whether

physicians welcome people with disability into their practices; we were particularly interested in the association of this outcome with physicians' confidence in being able to provide care of the same quality to people with disability that they provide to other patients. We fit three separate models for this outcome: Model 1 included independent variables representing the personal and practice characteristics of participants, model 2 included all model 1 variables and the three variables representing physicians' perceptions, and model 3 added confidence about caring for people with disability to the model 2 variables.

LIMITATIONS This study had important limitations. Because of budgetary constraints, we could not survey sufficient numbers of participants to compare findings across specialties. To maximize our response rate, we needed to develop a short survey (estimated fifteen-minute completion time), and yet we had many topics to cover. As noted above, five survey modules addressed specific disability types; however, the outcomes examined here cut across disabilities (that is, asked about disability in general). Physicians may have responded differently to questions about particular disability types (for example, mobility disability versus serious mental illness). We did not include questions that would explicitly link physicians' perceptions to their care decisions for patients with disability (for example, ordering of Pap tests) or would explore complex concepts such as "confidence in providing care." An online Implicit Association Test, similar to that for racial and ethnic minorities, is available,[31] but including this test in the survey protocol was infeasible. Although research has examined findings from diverse health care providers who chose to take the Implicit Association Test,[32] future research should explore test results pertaining to disability across random samples of physicians.

Research should also aim to understand better our significant findings relating to physicians' race and ethnicity. As expected, given the racial and ethnic distribution of US physicians, we had too few Black and Hispanic physicians to enable us to examine these issues fully. Finally, other physicians and specialties may have perspectives on disability that differ from those of our participants. We excluded physicians in the active military or VA practice, who often see many patients with disability and make specific accommodations—beyond those in civilian practices—to support these patients. Similarly, we did not include physical medicine or rehabilitation specialists, who because of their training might provide an interesting comparison. In addition, we did not explore issues relating to caring for children with disability, whose accommodation needs frequently differ significantly from those of adults.

Confidence in being able to provide the same quality of care was strongly associated with welcoming disabled patients.

Study Results

Exhibit 1 shows the personal and practice characteristics of the 714 survey participants. Overall, 62.0 percent were male; 64.5 percent were White; 61.7 percent worked in private, community-based practices; and 36.2 percent reported that they or a family member had any significant disability. Only twenty-five participants indicated that they require a disability accommodation to do their job (too few for detailed analysis).

PERCEPTIONS OF PEOPLE WITH DISABILITY AND THEIR CARE Appendix exhibit A2 shows the complete, noncollapsed responses to the five questions used to create our dichotomous predictor and outcome variables,[29] and exhibit 2 shows percentages for the dichotomous variables. Across participants, 79.8 percent "strongly" agreed that understanding their patients with disability is "very valuable," 18.1 percent "strongly" agreed that patients with disability are "often treated unfairly in the health care system," 82.4 percent of participants reported that people with significant disability have worse quality of life than people without disability, and 40.7 percent were "very confident" about being able to "provide the same quality of care" to disabled patients.

PARTICIPANTS' ATTITUDES AND PERSONAL AND PRACTICE CHARACTERISTICS Exhibit 2 shows bivariable associations between participants' attitude measures and their personal and practice characteristics. No individual characteristics were consistently statistically significantly associated with participants' perceptions. Exhibit 3 shows multivariable logistic regression results; regression results including confidence intervals appear in appendixes A3 and A4.[29] Women were

more likely than men (adjusted odds ratio: 2.36; 95% CI: 1.35, 4.12) to "strongly" value understanding their patients with disability. Compared with White physicians, Asian physicians were more likely to "strongly" value this understanding (aOR: 2.04; 95% CI: 1.02, 4.09). In addition, compared with White physicians, Asian and other non-White physicians were more likely to feel "very confident" in their ability to provide the same quality of care to people with disability (Asian, aOR: 1.73, 95% CI: 1.04, 2.89; other non-White, aOR: 1.77, 95% CI: 1.03, 3.04).

WELCOMING PATIENTS WITH DISABILITY INTO PRACTICES Exhibit 4 shows adjusted odds ratios for the major outcome variable: strong agreement about welcoming patients with disability into their practices. Overall, 56.5 percent of participants "strongly" agreed that they welcome patients with disability into their practices (data not shown). In the multivariable analyses, model 1 includes only participants' personal and practice characteristics, model 2 adds their responses to three perception questions, and model 3 adds the confidence in caring for patients with disability question to model 2. In all models, female physicians had significantly higher odds ratios than their male counterparts for "strongly" welcoming patients with disability. In addition to this gender effect, the full model found several significant associations: Asian physicians had significantly lower odds ratios than White physicians (aOR: 0.41; 95% CI: 0.23, 0.75), longer-serving physicians had significantly lower odds ratios than shorter-serving physicians (aOR: 0.58; 95% CI: 0.35, 0.97), physicians in private practice had significantly lower odds ratios (aOR: 0.38; 95% CI: 0.19, 0.75) than academic medical center physicians, physicians who valued understanding their patients with disability had higher odds ratios (aOR: 5.46; 95% CI: 3.03, 9.83) than other physicians, and physicians who were "very confident" in being able to provide the same quality of care to people with disability had higher odds ratios (aOR: 3.53; 95% CI: 2.20, 5.67) than other physicians.

EXHIBIT 1

Distribution of characteristics of participants in the survey of physicians' perceptions of people with disability, 2019–20

	Number[a]	Percent
PERSONAL CHARACTERISTICS		
Gender		
Male	451	62.0
Female	248	38.0
Race/ethnicity		
White	440	64.5
Asian	138	17.3
Hispanic	43	6.7
African American	37	5.9
Native American	2	0.2
Pacific Islander	6	0.9
Other	30	4.5
Self or family member has any significant disability		
Yes	244	36.2
No	449	63.8
PROFESSIONAL AND PRACTICE CHARACTERISTICS		
Primary specialty		
Primary care	357	64.1
Specialty care[b]	357	35.9
Years since graduating from medical school		
<20	222	33.5
20+	460	66.5
Practice type		
Academic teaching hospital	127	16.5
Private practice in community	438	61.7
Other	130	21.8
No. of physicians in practice		
Very small (1–3)	226	33.2
Small (4–11)	314	47.4
Large (12+)	150	19.4
No. of patients seen per week		
Low (<60)	221	31.1
Medium (60–80)	224	33.6
High (81+)	262	35.3
Percent of patients with Medicaid or uninsured		
Non-safety-net provider (>35%)	440	68.0
Safety-net provider (35%+)	176	32.0

SOURCE Authors' analysis of data from their survey, "Caring for Patients With Functional Limitations: National Survey Funded by the NIH," 2019–20. **NOTES** The numbers shown are unweighted. The percentages shown were weighted to account for differences in the probability of selection and response rates within each specialty. [a]Do not sum to total participant number (n = 714) because of missing data. [b]Specialties include rheumatology, neurology, ophthalmology, orthopedics, and obstetrics-gynecology.

Discussion

This national survey that examined the perceptions of practicing US physicians about caring for people with disability produced troubling findings. Only roughly half of physicians "strongly" agreed that they would welcome patients with disability into their practices. More than four-fifths of physicians reported that people with significant disability have "worse" quality of life than people without disability, and only two-fifths reported feeling "very confident" in their ability to provide the same quality of care to people with disability that they provide to people without disability. Roughly one-fifth "strongly" agreed that the health care system often treats disabled patients "unfairly." Our findings suggest that large proportions of practicing US physicians might hold biased or stigmatized perceptions of people with disability. Our survey did not assess whether participants appreciated that their perceptions are biased or instead believe that their views are justified and therefore do not negatively affect the quality of care they provide to disabled patients.

We are unaware of prior studies in which

EXHIBIT 2

Bivariable associations between perceptions about people with disability (PWD) and their care and survey participant characteristics

	Strongly agree that understanding PWD is valuable to them as physician		Strongly agree that PWD are treated unfairly in health system		Rates quality of life for PWD as worse		Very confident about providing same quality of care for PWD	
	No.	%	No.	%	No.	%	No.	%
All participants	544	79.8	116	18.1	569	82.4	283	40.7
PERSONAL CHARACTERISTICS								
Gender		***						**
Male	325	75.5	72	17.8	365	83.3	194	43.7
Female	208	86.2	43	18.6	193	80.7	81	34.9
Race/ethnicity		***						**
White	326	76.3	73	18.7	356	83.3	163	36.4
Asian	107	83.9	24	18.4	113	84.9	53	44.0
Hispanic/African American/other	97	87.1	18	15.9	89	78.9	58	52.1
Self or family member has any significant disability								
Yes	185	79.4	40	19.4	194	84.0	88	35.8
No	344	79.8	75	17.7	360	81.7	183	42.3
PROFESSIONAL AND PRACTICE CHARACTERISTICS								
Primary specialty		*						**
Primary care	282	81.9	62	18.1	275	81.8	129	37.7
Specialty care	262	76.2	54	18.0	294	83.6	154	46.2
Years since graduating from medical school		*						*
<20	155	75.3	44	20.2	180	84.4	71	34.6
20+	368	82.5	69	17.3	367	81.7	195	43.1
Practice type				**				***
Academic teaching hospital	94	77.5	33	28.1	102	79.6	35	26.7
Private practice in community	338	79.3	63	16.2	357	82.7	194	45.7
Other	108	83.2	19	15.5	105	83.3	53	37.5
No. of physicians in practice								*
Very small (1–3)	181	81.0	36	17.9	183	81.3	106	47.3
Small (4–11)	239	79.4	49	16.6	257	83.7	114	38.4
Large (12+)	116	79.3	30	22.5	121	82.1	60	36.1
No. of patients seen per week				***				**
Low (<60)	154	78.8	47	26.1	173	85.2	71	33.5
Medium (60–80)	179	79.7	37	16.9	181	81.3	88	39.7
High (81+)	204	80.3	31	12.7	209	81.2	120	47.0
Percent of patients with Medicaid or uninsured						**		
Non-safety-net provider (<35%)	339	78.9	72	18.6	372	86.1	173	39.7
Safety-net provider (≥35%)	137	79.8	29	16.2	136	78.6	74	41.8

SOURCE Authors' analysis of data from their survey, "Caring for Patients with Functional Limitations: National Survey Funded by the NIH," 2019–20. **NOTES** Significance indicators are based on two-sided chi-square tests of the association between participants' characteristics and their perceptions of people with disability. The percentages shown are weighted to account for differences in the probability of selection and response rates within each specialty. *$p < 0.10$ **$p < 0.05$ ***$p < 0.01$

physicians expressed this level of bias toward other populations that also experience disparities in care (for example, racial or ethnic minorities or people who identify as lesbian, gay, bisexual, or transgender).[33–36] Rather, these sorts of studies generally confront concerns that participants will provide socially desirable responses. It seems unlikely, for example, that more than four-fifths of physicians would assert that racial and ethnic minority patients have worse quality of life than nonminority patients or that nearly one-half of physicians would openly admit not strongly welcoming minority patients into their practices. Yet in our study, many physicians did not provide the socially desirable response.

Our multivariable findings suggest one potential explanation for the finding about not strongly welcoming disabled patients into their practices: Physicians expressing strong confidence in their ability to provide the same quality of care to people with disability had significantly higher odds of welcoming them into their practices. Medical schools generally do not include disability topics in their curricula.[15,16,37,38] Nevertheless, even physicians with more than twenty years of practice, who presumably should have extensive experience with this population, did not appear more likely to strongly welcome patients with disability into their practices.

EXHIBIT 3

Multivariable associations between perceptions about people with disability (PWD) and their care and survey participants' characteristics

	Adjusted odds ratios			
	Strongly agree that understanding PWD is valuable to them as physician	Strongly agree that PWD are treated unfairly in health system	Rates quality of life for PWD as worse	Very confident about providing same quality of care for PWD
PERSONAL CHARACTERISTICS				
Gender (ref: male)	***		**	
Female	2.36	0.95	0.58	0.98
Race/ethnicity (ref: White)	**			**
Asian	2.04	0.95	1.33	1.73
Hispanic/African American/other	2.01	1.01	1.11	1.77
Self or family member has any significant limitations (Ref: no)				
Yes	0.98	1.13	1.17	0.92
PROFESSIONAL AND PRACTICE CHARACTERISTICS				
Primary specialty (ref: primary care)				*
Specialty care	0.75	1.14	1.23	1.40
Years since graduating from medical school (ref: <20)	***			
20+	2.20	0.86	0.76	1.35
Practice type (ref: academic teaching hospital)				
Private practice in community	1.07	0.58	1.42	2.01
Other	1.30	0.65	1.74	1.73
Number of physicians in practice (ref: solo)				
Small	0.84	0.80	1.03	0.83
Large	0.96	0.90	1.18	0.80
Number of patients seen per week (ref: low)		**		
Medium	1.24	0.64	0.78	1.18
High	1.28	0.42	0.53	1.45
Percent of patients with Medicaid or uninsured (ref: not safety-net provider)			*	
Safety-net provider	0.94	0.78	0.59	1.00

SOURCE Authors' analysis of data from their survey, "Caring for Patients with Functional Limitations: National Survey Funded by the NIH," 2019–20. **NOTES** Details about characteristics (physician practice size categories, patients seen per week, and percent of patients with Medicaid or uninsured) are in exhibits 1 and 2. The data have been weighted to account for differences in the probability of selection and response rates within each specialty. *$p < 0.10$ **$p < 0.05$ ***$p < 0.01$

Our study was not designed to test whether these perceptions translate directly into disparities in care. As noted earlier, studies of racial/ethnic implicit bias among physicians have found that these beliefs significantly affect treatment decisions, patients' outcomes, and other aspects of care.[24] It seems reasonable to expect that explicit bias would work similarly, with deleterious effects on care equity for people with disability.

Qualitative research studies involving interviews with people with disability suggest that physicians often make erroneous assumptions about patients' values and preferences, limiting their health care options and compromising quality of care.[6,39] Examples include failures to provide Pap tests to women with disability or to discuss contraception options because of incorrectly assuming they are neither sexually active nor at risk for unintended pregnancy.[39] Another example involves physicians assuming that women with disability who are newly diagnosed with early-stage breast cancer prefer mastectomy to breast-conserving surgery under the inaccurate presumption that these women care little about preserving their bodies and physical appearance. Some physicians believe that they have superior technical knowledge about disabling conditions, but they can be wrong, taking actions that harm patients. An example is physicians incorrectly believing that all patients with spinal cord injury cannot feel pain below the level of their injury and therefore refusing to provide pain relief for procedures below that level (for example, topical anesthetic during skin biopsy of the lower leg), thus causing these patients sometimes excruciating pain.[39]

Some patients with disability express frustration about physicians' lack of insight into the quality of their daily lives.[39] Yet asking patients with disability to prove their quality of life to their physicians to avoid inequitable treatment is ethically unacceptable. Why should people with disability, unlike other patients, be com-

EXHIBIT 4

Multivariable associations between welcoming people with disability (PWD) in their practices and survey participants' characteristics, perceptions of PWD and their care, and confidence in providing the same quality of care

	Adjusted odds ratios		
	Model 1: participant characteristics	**Model 2: model 1 + three perceptions indicators**	**Model 3: model 2 + confidence in providing same quality of care**
PERSONAL CHARACTERISTICS			
Gender (ref: male)	***	***	***
Female	2.42	2.05	2.29
Race/ethnicity (ref: White)	*	**	**
Asian	0.66	0.51	0.41
Hispanic/African American/other	1.57	1.32	1.15
Self or family member has any significant limitations (ref: no)			
Yes	1.12	1.11	1.15
PROFESSIONAL AND PRACTICE CHARACTERISTICS			
Primary specialty (ref: primary care)		*	
Specialty care	1.35	1.49	1.39
Years since graduating from medical school (ref: <20)		*	**
20+	0.84	0.64	0.58
Practice type (ref: academic teaching hospital)		*	***
Private practice in community	0.54	0.49	0.38
Other	0.58	0.50	0.42
No. of physicians in practice (ref: solo)			
Small	0.71	0.69	0.71
Large	0.78	0.74	0.80
No. of patients seen per week (ref: low)			
Medium	0.80	0.70	0.69
High	1.26	1.13	1.09
Percent of patients with Medicaid or uninsured (ref: not safety-net provider)			
Safety-net provider	1.01	1.03	1.01
PERCEPTIONS			
Understanding patients with disability is valuable to me as a physician (ref: not strongly agree)		***	***
Strongly agree	—[a]	6.19	5.46
Patients with disability treated unfairly in health system (ref: not strongly agree)			
Strongly agree	—[a]	0.85	0.96
Quality of life for PWD (ref: worse)			
Not worse	—[a]	1.12	1.31
CONFIDENCE			
Same quality of care for PWD (ref: not very confident)			***
Very confident	—[a]	—[a]	3.53

SOURCE Authors' analysis of data from their survey, "Caring for Patients with Functional Limitations: National Survey Funded by the NIH," 2019–20. **NOTES** Details about characteristics (physician practice size categories, patients seen per week, and percent of patients with Medicaid or uninsured) are in exhibits 1 and 2. The data have been weighted to account for differences in the probability of selection and response rates within each specialty. [a]Variable not included in model. *$p < 0.10$ **$p < 0.05$ ***$p < 0.01$

pelled to justify to their physicians how they value their lives? More than twenty years ago, researchers investigated how perceptions of the quality of life of people with disability can diverge from societal assumptions. These inquiries identified a so-called disability paradox:[40] that many people with significant disability equilibrate to living with functional limitations and enjoy good quality of life. Under the disability paradox, "the general public, physicians and other health care workers perceive that persons with disabilities have an unsatisfying quality of life despite the fact that over 50% of these people report an excellent or good quality of life."[40] More than three decades after the ADA, the disability paradox concept seems somewhat outdated, given its assumptions that people without disability have the authority to define what constitutes good-quality life and that all people's lives must fit some preconceived notion of "normality."

However, just as it did for racial and ethnic

minorities, the COVID-19 pandemic has exposed long-standing aspects of US health care that severely disadvantage people with disability.[41] As states promulgated crisis standards of care to guide decisions allocating scarce resources, such as tests, intensive care unit beds, and mechanical ventilators,[42] some of these standards explicitly excluded people with disability.[43] Concerns that crisis standards of care would discriminate against people with disability prompted the HHS Office for Civil Rights to warn on March 28, 2020, that "persons with disabilities should not be denied medical care on the basis of stereotypes, assessments of quality of life, or judgments about a person's relative 'worth' based on the presence or absence of disabilities."[44] Our study underscores that many physicians perceive worse quality of life for people with disability. The high prevalence of negative perceptions of living with disability raises questions about constituting the triage teams that make critical resource decisions when crisis standards of care are invoked. Proactively assessing implicit and explicit biases toward disability among physicians involved in decision making concerning crisis standards of care is critically important.

Conclusion

Sixty-one million Americans have some type of disability,[2] and these numbers are growing.[12] All physicians and health care providers can expect to see increasing volumes of patients with disability. Our findings about physicians' willingness to welcome patients with disability, confidence in caring for these patients, and problematic perceptions of quality of life were therefore deeply concerning and have important implications for health care delivery in the US. Confidence in being able to provide the same quality of care was strongly associated with welcoming disabled patients. All levels of medical education should include more training about disability, including disability cultural competence[26] and etiquette.[45] Training that provides greater empathy about patients' daily lives, such as house calls[46] or standardized patients who have disability,[37] might offer important insights. Similar to programs in which trainees take online Implicit Association Tests relating to race and ethnicity,[47] educators could add an Implicit Association Test disability module. Finally, situations in which people with disability confront special vulnerability, such as decision making around crisis standards of care,[43,44] require heightened attention to ensure equitable care. ■

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Appendix

Appendix Exhibit A1

Caring for Patients with Functional Limitations: National Survey Funded by the NIH

2019

Principal Investigators:
Harvard Medical School
University of Colorado School of Medicine

Conducted by:
Center for Survey Research
University of Massachusetts-Boston

SURVEY INSTRUCTIONS

- Your responses are completely confidential!
- Your participation in this study is voluntary.
- For each question, please fill in one box ☑ or write in an answer, as requested.
- If there is a question you would rather not answer, feel free to skip it and go on to the next question.
- Please return your completed survey in the enclosed postage-paid envelope to the Center for Survey Research.
- If you have any questions about this survey or do not wish to participate, please call Dragana Bolcic-Jankovic at the Center for Survey Research at 1-800-492-5845.

Completion and return of this survey confirms your consent to participate.

PLEASE COMPLETE THIS SECTION FIRST

1. What is your primary specialty?

☐ 1 Family practice
☐ 2 Internal medicine or general internal medicine
☐ 3 Neurology
☐ 4 OB/GYN
☐ 5 Ophthalmology
☐ 6 Orthopedics
☐ 7 Rheumatology
☐ 8 None of the above →

IF NONE OF THE ABOVE, DO NOT CONTINUE. Please return the questionnaire in the envelope provided and we will remove your name from our list. This will ensure that you are not re-contacted to participate in the survey. Thank you!

2. Do you currently spend at least 10 hours a week in direct patient care?

☐ 1 Yes
☐ 2 No →

IF NO, DO NOT CONTINUE. Please return the questionnaire in the envelope provided and we will remove your name from our list. This will ensure that you are not re-contacted to participate in the survey. Thank you!

A. CHARACTERISTICS OF YOUR MEDICAL PRACTICE

A1. <u>In an average week</u>, approximately how many <u>outpatients</u> do you see?

#_____ Patients per week → **IF "0" SKIP TO SECTION H**

A2. How would you describe your medical practice site? (**Check One** - *If you work in more than one practice, please answer about the practice where you see the most patients.)*

☐ 1 Private practice in the community
☐ 2 Teaching hospital
☐ 3 Community nonteaching hospital
☐ 4 Community health center
☐ 5 Other *(Please Specify)* →

_____
(please print)

A3. <u>Including yourself</u>, approximately how many of these types of health care professionals work in your practice?

_____ Physicians (excluding residents)
_____ Nurse practitioners or physician assistants

A4. Approximately what percentages of your patients are primarily covered by:

			% Medicaid (Including dual eligibility for Medicare)
			% Medicare
			% Uninsured/self-pay

A5. Are you the owner or a co-owner of your medical practice?

☐ 1 Yes
☐ 2 No

B. PATIENTS WITH SIGNIFICANT CHRONIC MOBILITY LIMITATIONS

By mobility limitations we mean significant chronic difficulties with movement, including difficulties walking, standing, climbing stairs, and using arms and hands.

B1. <u>In an average month</u>, approximately how many patients do you see with significant chronic mobility limitations?

#_____ Patients per month → **IF "0" SKIP TO SECTION C**

B2. Do you or your staff routinely record the weight of patients with significant chronic mobility limitations?

☐ 1 Yes
☐ 2 No → **IF "NO" SKIP TO B3**
☐ 7 *Not applicable to my patients* → **SKIP TO B3**

B2a. When obtaining the weight of patients with significant mobility limitations who cannot use a standard scale, how often do you or your staff…? (Check one for each)

	Always	Usually	Sometimes	Rarely	Never	*N/A*
B2a1. Use a wheelchair accessible weight scale (aka "roll-on scale")	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B2a2. Use a weight scale within a lift device (e.g., Hoyer lift)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B2a3. Send patients outside your practice to measure their weight	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B2a4. Use previous weight in patients' medical record	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B2a5. Ask patients how much they weigh	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7

B3. When patients with significant chronic mobility limitations cannot transfer independently onto an exam table or exam chair, do you or your staff…?

	Always	Usually	Sometimes	Rarely	Never	*N/A*
B3a. Get help from a person(s) accompanying the patient	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B3b. Use a lift device	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
B3c. Use an automatic height adjustable exam table	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7

B4. When it is not possible to transfer a patient with significant chronic mobility limitations onto an exam table or exam chair, is that due to…?

	Major reason	Moderate reason	Minor reason	Not at all a reason	*N/A*
B4a. Inadequate staffing	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4b. No height adjustable exam table/chair	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4c. No lift device (e.g., Hoyer lift)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4d. Patient refuses to be transferred	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4e. Fear of injury to yourself or staff	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4f. Fear of injury to patient	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4g. Fear of legal liability or exposure	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7
B4h. The amount of additional time it takes	☐ 1	☐ 2	☐ 3	☐ 4	☐ 7

B5. Have you or another employee in your practice ever been injured while transferring a patient with significant chronic mobility limitations?

☐ 1 Yes
☐ 2 No
☐ 7 *Don't know/Not sure*

C: PATIENTS WITH SIGNIFICANT VISION LIMITATIONS

By vision limitations we mean people who are blind or have significant difficulty seeing, even with glasses or other corrective lenses.

C1. <u>In an average month</u>, how many patients do you see with significant vision limitations?

#_____ Patients per month ➔ **IF "0" SKIP TO SECTION D**

C2. When seeing patients with significant vision limitations, how often do you or a staff member…?

	Always	Usually	Sometimes	Rarely	Never	*N/A*
C2a. Verbally describe the exam room	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
C2b. Use printed materials in Braille (e.g., information sheets)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
C2c. Use printed materials in large fonts	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
C2d. Allow patients to audio-record the visit	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7

D: PATIENTS WITH SIGNIFICANT HEARING LIMITATIONS

By hearing limitations we mean people who are deaf or have significant difficulty hearing, even with hearing aids.

D1. <u>In an average month</u>, how many patients do you see with significant hearing limitations?

#_____ Patients per month ➞ **IF "0" SKIP TO SECTION E**

D2. In your practice or health care system, when communicating with patients with significant hearing limitations, how often do you utilize each of the following…?

	Always	Usually	Sometimes	Rarely	Never	*N/A*
D2a. In-person sign language interpreter hired by you or your practice setting (e.g., hospital)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2b. In-person sign language interpreter brought by patients	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2c. Remote sign language interpreter accessible via computer	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2d. TTY/TDD device	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2e. Speak with someone who accompanies the patient	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2f. Typed message through a mobile device or tablet	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2g. Notes written on paper	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2h. Speak louder/ slower	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7
D2i. Lip reading by patients	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 7

E: PATIENTS WITH COMORBID SERIOUS MENTAL ILLNESS

By serious mental illness we mean conditions such as bipolar disorder, severe chronic depression, schizophrenia that seriously impair major life activities.

E1. <u>In an average month</u>, about how many patients do you see who have comorbid serious mental illness?

#_____ Patients per month ➞ **IF "0" SKIP TO SECTION F**

E2. Overall, how prepared are you and your staff to care for patients with comorbid serious mental illness?

☐ 1 Very prepared
☐ 2 Somewhat prepared
☐ 3 Somewhat unprepared
☐ 4 Very unprepared

F: PATIENTS WITH SIGNIFICANT INTELLECTUAL DISABILITY

By intellectual disability we mean people with significant limitations in intellectual ability and in adaptive behavior (e.g., social, conceptual, and practical skills) that were identified up to age 18.

F1. In an average month, about how many patients do you see with significant intellectual disability?

#_____ Patients per month ➔ **IF "0" SKIP TO SECTION G**

F2. When you see patients with significant intellectual disability, how often do you communicate primarily with a person other than the patient?

- ☐ 1 Always
- ☐ 2 Usually
- ☐ 3 Sometimes
- ☐ 4 Rarely
- ☐ 5 Never

F3. When you see patients with significant intellectual disability, are these patients ever sedated in order to perform routine, office-based tests or treatments (e.g. blood draws, Pap smears, etc.)?

- ☐ 1 Yes (please specify for which procedure) _____
- ☐ 2 No

G: AMERICANS WITH DISABILITIES ACT

The Americans with Disabilities Act, signed in 1990, gives civil rights protections to persons with disability.

G1. Overall, how much do you know about your legal responsibilities or obligations as a physician under the ADA when caring for patients with disability?

- ☐ 1 A lot
- ☐ 2 Some
- ☐ 3 A little
- ☐ 4 Nothing

G2. Who is responsible for determining what reasonable accommodation(s) patients with disability should receive while being cared for in your practice? (Check all that apply)

- ☐ 1 Physician(s) caring for the patient
- ☐ 2 Patients/family
- ☐ 3 Practice staff/managers/administrators
- ☐ 4 Insurers/payors
- ☐ 5 Other (specify) _____

G3. Who is responsible for paying for reasonable accommodation(s) that patients with disability receive while being cared for in your practice? (Check one)

- ☐ 1 Owners of practice
- ☐ 2 Patients/family
- ☐ 3 Insurers/payors

G4. Please tell us how much each of the following is a barrier for you in caring for patients with disability…?

	Not at all a barrier	Small barrier	Moderate barrier	Large barrier
G4a. Lack of time	☐ 1	☐ 2	☐ 3	☐ 4
G4b. Lack of reimbursement for additional time it takes to care for patients with disability	☐ 1	☐ 2	☐ 3	☐ 4
G4c. Lack of formal education/training	☐ 1	☐ 2	☐ 3	☐ 4
G4d. Lack of funds to purchase special equipment	☐ 1	☐ 2	☐ 3	☐ 4
G4e. Lack of physical space in your practice to accommodate patients with disability	☐ 1	☐ 2	☐ 3	☐ 4
G4f. Lack of appropriate facilities for service dogs	☐ 1	☐ 2	☐ 3	☐ 4

G5. Overall, how much do you feel your practice is at risk of an ADA lawsuit because of problems providing reasonable accommodations for patients with disability?

☐ 1 A lot of risk
☐ 2 Some risk
☐ 3 A little risk
☐ 4 No risk at all

G6. Overall how confident are you in your ability to provide the same quality of care to patients with disability as you provide to patients without disability. Would you say…?

☐ 1 Very confident
☐ 2 Somewhat confident
☐ 3 Not very confident
☐ 4 Not at all confident

G7. In general, compared to persons without disability, do you believe the overall quality of life of persons with significant disability is…?

☐ 1 A lot better
☐ 2 A little better
☐ 3 The same
☐ 4 A little worse
☐ 5 A lot worse

G8. Thinking about the broader health care system, how would you rate the quality of care patients with different significant limitations receive compared to patients without such limitations…?

	Much better	A little better	The same	A little worse	Much worse
G8a. Mobility	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
G8b. Hearing	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
G8c. Vision	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
G8d. Serious mental illness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
G8e. Intellectual disability	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

G9. To what extent do you agree or disagree with the following statements…?

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
G9a. Understanding my patients with disability is valuable to me as a physician.	☐ 1	☐ 2	☐ 4	☐ 5
G9b. The treatment of patients with disability is too time consuming.	☐ 1	☐ 2	☐ 4	☐ 5
G9c. People with disability are often treated unfairly in the health care system.	☐ 1	☐ 2	☐ 4	☐ 5
G9d. I welcome patients with disability into my practice.	☐ 1	☐ 2	☐ 4	☐ 5
G9e. Nonadherence is an issue with patients with disability because they lack adequate support.	☐ 1	☐ 2	☐ 4	☐ 5

H. PERSONAL DEMOGRAPHICS

H1. What is your gender? Do you identify as:

MARK ONE

☐ 1 A woman
☐ 2 A man
☐ 3 Transgender
☐ 4 Non-binary or genderqueer
☐ 5 Prefer not to say

H2. Please describe your race/ethnicity.

MARK ONE

☐ 1 African-American (non-Hispanic)
☐ 2 Asian
☐ 3 Native American
☐ 4 Pacific Islander
☐ 5 Hispanic
☐ 6 White (non-Hispanic)
☐ 7 Other or combination *(Please Specify)* ➢ _____

H3. In what year did you graduate from medical school?

Year

H4. How long have you worked in your current practice?

#_____ Years

H5. Do you have any significant limitation(s) that require accommodation(s) in order to do your job as a physician?

☐ 1 No
☐ 2 Yes *(Please Specify)* _____

H6. Do <u>you or an immediate family member</u> have any significant limitations related to:

	Yes	No
H6a. Mobility	☐ 1	☐ 2
H6b. Hearing	☐ 1	☐ 2
H6c. Vision	☐ 1	☐ 2
H6d. Serious mental illness	☐ 1	☐ 2
H6e. Intellectual disability	☐ 1	☐ 2

Thank you for taking the time to complete this important survey.

Comments: In the space below please provide any comments or insights regarding caring for patients with disability that you feel it is important for us to know about.

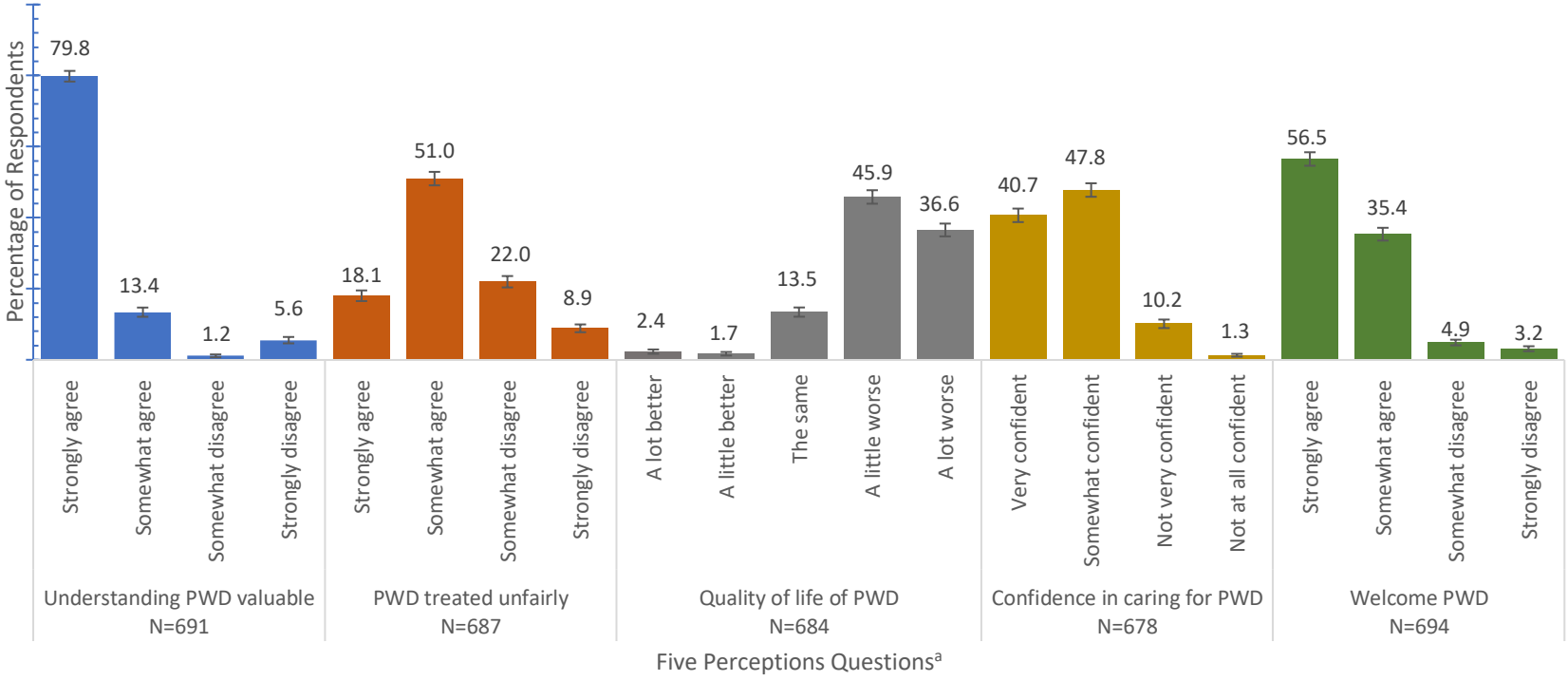
_____
_____
_____
_____

RETURN INSTRUCTIONS

Please return your completed questionnaire in the postage-paid envelope provided. If you misplaced the envelope, please send your questionnaire to: **Center for Survey Research** 100 Morrissey Boulevard, Boston, MA 02125.

Appendix Exhibit A2

Distributions of Perceptions of People with Disability and Their Health Care



a Questions from survey in order or appearance in figure, from left to right:

“To what extent do you agree or disagree with the following statements… Understanding my patients with disability is valuable to me as a physician.”

“To what extent do you agree or disagree with the following statements… People with disability are often treated unfairly in the health care system.”

“In general, compared to persons without disability, believe the overall quality of life of persons with disability is...”

“Overall, how confident in ability to provide the same quality of care to patients with disability as provided to patients without disability?”

“To what extent do you agree or disagree with the following statements… I welcome patients with disability into my practice.”

Exhibit A3

Multivariable Associations Between Perceptions about People with Disability (PWD) and Their Care and Survey Participant Characteristics

Characteristics	Strongly agree that PWD are valuable to them as physicians	Strongly agree that PWD treated unfairly in health system	Rates quality of life for PWD as worse	Very confident about providing equal quality of care for PWD
	AOR (95% CI)			
Gender	***		**	
Male	REF	REF	REF	REF
Female	2.36 (1.35, 4.12)	0.95 (0.55, 1.63)	0.58 (0.33, 1.01)	0.98 (0.63, 1.52)
Race/Ethnicity	**			**
White	REF	REF	REF	REF
Asian	2.04 (1.02, 4.09)	0.95 (0.50, 1.81)	1.33 (0.64, 2.77)	1.73 (1.04, 2.89)
Hispanic/African American/Other	2.01 (0.96, 4.20)	1.01 (0.50, 2.03)	1.11 (0.56, 2.20)	1.77 (1.03, 3.04)
Self or family member has any significant limitations				
No	REF	REF	REF	REF
Yes	0.98 (0.60, 1.61)	1.13 (0.69, 1.88)	1.17 (0.69, 1.98)	0.92 (0.61, 1.40)
Primary specialty				*
Primary care	REF	REF	REF	REF
Specialty care	0.75 (0.47, 1.20)	1.14 (0.70, 1.86)	1.23 (0.71, 2.13)	1.40 (0.94, 2.07)
Years since graduating medical school	***			
< 20	REF	REF	REF	REF
≥ 20	2.20 (1.33, 3.64)	0.86 (0.50, 1.48)	0.76 (0.42, 1.37)	1.35 (0.86, 2.10)
Practice type				
Academic teaching hospital	REF	REF	REF	REF
Private practice in the community	1.07 (0.55, 2.08)	0.58 (0.28, 1.20)	1.42 (0.65, 3.10)	2.01 (1.05, 3.85)
Other	1.30 (0.60, 2.83)	0.65 (0.29, 1.47)	1.74 (0.72, 4.19)	1.73 (0.83, 3.58)
Number of physicians in practice				
Solo (0-2)	REF	REF	REF	REF
Small (3-10)	0.84 (0.49, 1.47)	0.80 (0.45, 1.43)	1.03 (0.57, 1.87)	0.83 (0.53, 1.31)

Characteristics	**Strongly agree that PWD are valuable to them as physicians**	**Strongly agree that PWD treated unfairly in health system**	**Rates quality of life for PWD as worse**	**Very confident about providing equal quality of care for PWD**
Large (11+)	0.96 (0.48, 1.89)	0.90 (0.43, 1.87)	1.18 (0.52, 2.68)	0.80 (0.45, 1.44)
Number of patients seen per week		**		
Low (< 60)	REF	REF	REF	REF
Medium (60-80)	1.24 (0.69, 2.23)	0.64 (0.36, 1.15)	0.78 (0.39, 1.56)	1.18 (0.70, 1.98)
High (≥ 81)	1.28 (0.69, 2.37)	0.42 (0.21, 0.85)	0.53 (0.27, 1.05)	1.45 (0.86, 2.44)
Percent of patients with Medicaid and/or Uninsured			*	
Non safety net provider (< 35%)	REF	REF	REF	REF
Safety net provider (≥ 35%)	0.94 (0.56, 1.58)	0.78 (0.46, 1.33)	0.59 (0.34, 1.03)	1.00 (0.65, 1.56)
C-statistic	**0.68**	**0.62**	**0.61**	**0.63**

*p < 0.10, **p < 0.05, ***p <0.01

Exhibit A4

Multivariable Associations Between Welcoming People with Disability (PWD) in Their Practices and Survey Participant Characteristics, Perceptions of PWD and Their Care, and Confidence in Providing Same Quality Care

Characteristics	Model 1: participant characteristics	Model 2: Model 1 + three perceptions indicators	Model 2: Model 2 + confidence in providing same quality care
	AOR (95% CI)		
Gender	*****	***	***
Male	REF	REF	REF
Female	2.42 (1.53, 3.80)[a]	2.05 (1.27, 3.31)	2.29 (1.40, 3.76)
Race/Ethnicity	*	**	**
White	REF	REF	REF
Asian	0.66 (0.38, 1.18)	0.51 (0.29, 0.90)	0.41 (0.23, 0.75)
Hispanic/African American/Other	1.57 (0.89, 2.78)	1.32 (0.71, 2.47)	1.15 (0.61, 2.19)
Self or family member has any significant limitations			
No	REF	REF	REF
Yes	1.12 (0.74, 1.71)	1.11 (0.71, 1.73)	1.15 (0.72, 1.85)
Primary specialty		*	
Primary care	REF	REF	REF
Specialty care	1.35 (0.89, 2.06)	1.49 (0.95, 2.32)	1.39 (0.88, 2.19)
Years since graduating medical school		*	**
< 20	REF	REF	REF
≥ 20	0.84 (0.54, 1.31)	0.64 (0.39, 1.05)	0.58 (0.35, 0.97)
Practice type		*	***
Academic teaching hospital	REF	REF	REF
Private practice in the community	0.54 (0.29, 0.98)	0.49 (0.25, 0.94)	0.38 (0.19, 0.75)
Other	0.58 (0.30, 1.15)	0.50 (0.25, 1.01)	0.42 (0.21, 0.86)
Number of physicians in practice			
Solo (0-2)	REF	REF	REF
Small (3-10)	0.71 (0.44, 1.13)	0.69 (0.41, 1.14)	0.71 (0.42, 1.23)
Large (11+)	0.78 (0.43, 1.42)	0.74 (0.40, 1.37)	0.80 (0.41, 1.54)

Characteristics	Model 1: participant characteristics	Model 2: Model 1 + three perceptions indicators	Model 2: Model 2 + confidence in providing same quality care
Number of patients seen per week			
Low (< 60)	REF	REF	REF
Medium (60-80)	0.80 (0.48, 1.32)	0.70 (0.41, 1.20)	0.69 (0.40, 1.17)
High (≥ 81)	1.26 (0.75, 2.13)	1.13 (0.65, 1.99)	1.09 (0.62, 1.91)
Percent of patients with Medicaid and/or Uninsured			
Non safety net provider (<35%)	REF	REF	REF
Safety net provider (≥35%)	1.01 (0.65, 1.57)	1.03 (0.65, 1.63)	1.01 (0.63, 1.63)
Understanding patients with disability is valuable to me as a physician		*****	*****
Not strongly agree	NA	REF	REF
Strongly Agree	NA	6.19 (3.49, 10.97)	5.46 (3.03, 9.83)
Patients with disability treated unfairly in health system			
Not strongly agree	NA	REF	REF
Strongly Agree	NA	0.85(0.48, 1.49)	0.96 (0.54, 1.70)
Quality of Life PWD			
Worse	NA	REF	REF
Not worse	NA	1.12 (0.63, 1.99)	1.31 (0.72, 2.38)
Quality of Care for PWD		*****	*****
Not very confident	NA	NA	REF
Very confident	NA	NA	3.53 (2.20, 5.67)
C-statistic	**0.64**	**0.73**	**0.77**
-2 Log Likelihood	**136278.5**	**125215.0**	**118333.8**
Degrees of Freedom	**13**	**16**	**17**

*p < 0.10, **p < 0.05, ***p < 0.01, ****p < 0.001, *****p < 0.0001