

ORIGINAL RESEARCH

Assessing Community Health Center (CHC) assets and capabilities for recruiting physicians: the CHC Community Apgar Questionnaire

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ABSTRACT

Introduction: Recent trends suggest that community health centers (CHCs) may experience a shortage of qualified physicians required to meet current and future demand. The purpose of this study was to develop an evaluation instrument, the CHC Community Apgar Questionnaire (CHC CAQ) for Idaho CHCs to use in physician recruitment.

Methods: The instrument was developed based on the Critical Access Hospital Community Apgar Questionnaire (CAH CAQ). The CHC CAQ was customized for CHC use and 12 new factors were identified for substitution in the CHC instrument. All 13 CHCs in Idaho participated in this study. One site was chosen per CHC if the CHC had multiple service locations. In each community, the administrator of the CHC and the physician with recruiting responsibilities participated individually in a structured interview.

Results: A total of 11 physicians and 11 administrators participated in the study. Differences were found across and within classes of factors associated with success in physician recruitment. Alpha communities, those historically having more success in physician recruitment, scored higher on CAQ metrics than less successful beta communities. No material differences were noted across physician and administrator ratings. Cumulative mean Community Apgar scores (CHC CAQ) were mostly higher in alpha communities.



Conclusion: The CHC CAQ, like the CAH CAQ, seems to discriminate between communities with differing assets and capabilities based on historical community-specific workforce trends. This assessment may suggest which factors are most important for a community to address with limited available resources and which factors are useful in marketing their CHC to prospective physicians.

Key words: community health center, family medicine, physician recruitment and retention, underserved communities, USA.

Introduction

Recent evidence shows over 20 million patients currently receive medical care at 1200 Community Health Centers (CHCs) in over 8000 site locations in the USA^{1,2}. Community Health Centers provide affordable primary and preventative health care to at risk populations, including those on low-incomes, the uninsured, the unemployed, migrant workers, those who are homeless, racial and ethnic minorities, and other underserved populations^{2,3}. The Public Health Service Act, Section 330, supplies funding for CHCs to deliver primary and preventative care to these medically underserved populations⁴. Recent initiatives have increased federal funding to introduce new CHCs and expand existing facilities in underserved areas⁵. This federal initiative to expand CHCs may exacerbate an already existing physician supply problem^{6,7}, especially regarding those willing to locate to underserved areas⁸.

Another trend affecting the demand for physician services in underserved areas is the aging of Americans as baby boomers start to retire and require more medical attention. The United States Census Bureau predicted that the United States (US) population of age 65 years or older will grow by 60% between 2000 and 2030⁹. In addition, the increasing attrition rate among aging physicians and population growth, particularly in the elderly population, will also affect physician supply¹⁰. Currently, there are approximately 7.3 million uninsured patients receiving care at CHCs, which increased from 3.9 million patients in 1998². The new health system reform law is anticipated to also contribute to the physician shortage due to the expansion of coverage to

uninsured Americans and the subsequent increased demand at CHCs^{11,12}. Rural areas contain 20% of the US population but only 9% of the US supply of physicians^{13,14}. Almost half of CHCs are located in rural areas and these CHCs serve 10 million people or one in seven rural residents¹⁵. These rural areas continue to experience significant challenges in recruiting physicians¹⁶⁻¹⁸ despite creative medical school based initiatives focused on alleviating physician shortages in these underserved areas^{19,20}. Similarly, initiatives in rural residency education have recently expanded and study of the outcomes for these graduate programs in producing physicians who practice in CHCs and other underserved rural environments is being reported²¹. Despite these supply side efforts, the production of physicians will not be able to increase at the same rate as the demand for their services. The cumulative impact of increasing demand for physicians as CHC numbers increase, demographic changes in the US population, physician attrition, the new healthcare reform law and the challenge of recruitment and retention of work force in rural areas will provide significant challenges to CHCs as they attempt to provide a qualified medical staff for their facilities.

The number of published studies that document successful case reports and/or strategies regarding CHC physician recruitment is limited. Barriers can often exist in the public sharing of information related to both successful physician recruiting and particularly as related to presentation or discussion of local challenges. As a result, many facilities and communities must rely on individual contractual assistance from physician recruitment firms and/or their own experience-based recruitment strategies without the benefit of a comparative, evidence-based or outside perspective. Without having an opportunity to identify and facilitate



discussion of their communities' unique assets and capabilities and the ability to relate this information to regional phenomena, facilities and communities with historical difficulties in recruitment and retention of physicians may continue to experience physician shortage problems. Hesitancy to communicate even recognized shortfalls in order to prioritize efforts and effect cooperation between physicians and administrators or within the broader community can be an unintentional barrier.

The Critical Access Hospital Community Apgar Questionnaire (CAH CAQ) was developed to help rural communities address recruitment and retention challenges related to physician shortfall issues using a conceptual model that addressed the challenges identified²². The CAH CAQ terminology was adapted from the original newborn Apgar score developed by Virginia Apgar, which utilized five physiological classes (heart rate, respiratory effort, reflex irritability, muscle tone and color) to evaluate, and provide focused interventions for, an infant's medical condition twice in the minutes after birth²³. Similarly, the CAH CAQ uses a community measurement scale comprised of five classes important to physician recruitment and retention (geographic, economic, scope of practice, medical support and hospital/community support) to provide a serial evaluation for intervention and planning twice across a given time span. Geographic class factors include spousal satisfaction, schools and the perception of the community. Economic class factors include loan repayment, signing bonus and part-time opportunities. Scope of practice factors include obstetrics, mental health and emergency room. Medical support factors include specialist availability, nursing workforce and call/practice coverage. Finally, hospital/community support factors include electronic medical records, welcome/recruitment program and televideo support. Across all of the classes, 50 factors were identified and each class contained 10 factors. The CAH CAQ is now being used in Idaho, Wyoming, North Dakota, Wisconsin and Alaska to assist critical access hospitals in physician recruiting efforts.

Based on this successful critical access hospital work, the Community Health Center Community Apgar Questionnaire (CHC CAQ) was developed. The purpose of this article is to report the findings from the validation research performed on the CHC CAQ during the development of this evaluation instrument. The CHC CAQ was developed to assess and differentially diagnose the strengths and challenges of an individual community as well as to provide information about the aggregate group. The CAQ assists in quantifying and visually demonstrating what has traditionally been a problem more commonly addressed by a more qualitative, expert-opinion approach. This instrument, accompanied by a growing database of aggregated data, also provides the opportunity for a community to gain peer comparison and time sequence comparison analysis. The results of this investigation may help CHCs in Idaho and other regions of the country to develop more effective recruitment strategies.

Methods

Survey development

The CHC CAQ was developed based on the CAH CAQ. Researchers identified CHC-specific factors important in recruitment and retention through research, site visits to Idaho communities and discussions with physicians, CHC administrators and other professionals working to improve health care in underserved communities. As with the CAH CAQ, 50 factors were categorized into one of the following five classes: geographic, economic, scope of practice, medical support or facility/community support. Note that the hospital/community support class of the CAH CAQ was changed to facility/community support for the CHCs. Consistent with the CAH CAQ, each class of the CHC CAQ contained 10 factors. Further, 12 of the 50 (24%) CAH CAQ factors were different from those in the CHC CAQ to better represent physician recruitment and retention concerns of CHCs. These factors were housing, length of contract flexibility, perceived fiscal stability, retirement package, emergency/stabilization care, minor trauma, office gynecology procedures, pharmacy services, language services



support, medical reference resources, delegated physician patient services and moonlighting opportunities. A series of three open-ended questions were also administered to validate the factors and identify any factor seen as significant but not addressed within the CHC CAQ. The CHC CAQ is provided in Appendix I and Appendix II provides a glossary of terms for the 50 factors in the CHC CAQ.

Selection and recruitment of target populations

The target communities for the CHC CAQ were all 13 CHCs in Idaho. One site was chosen per CHC if the CHC had multiple service locations. The site within each system with the largest medical staff and patient population served was selected as this site would be the major service access point for the CHC. The respondents were asked to answer the CHC CAQ based on an aggregate assessment across all locations if the CHC had multiple locations and their experience of the most active recruitment site. The degree of historical success in recruiting and retaining physicians in each community was identified by the researchers prior to the data analysis. Community Health Centers with more success in recruiting and retaining physicians were labeled as alpha or 'A' communities and those with less success were labeled as beta or 'B' communities. These assignments to either alpha or beta community status were based on statewide site visits, input from Idaho Primary Care Association employees and by experience in placing physicians in Idaho communities by physician leaders at the Family Medicine Residency of Idaho. The final sample included seven alpha (A) and four beta (B) CHCs for a total of 11 CHCs. Metro and non-metro or rural community classifications were identified using a 50 000 population threshold for rural communities²⁴. There were seven out of 11 sites (63.6%) in the non-metro or rural category and four metropolitan communities (36.4%). Due to the rural nature of Idaho and the large underserved populations treated in a limited number of CHCs, even the most metropolitan-located Idaho CHCs frequently serve rural populations in satellite clinics. Two CHCs were excluded from the final sample, one due to potential conflict of interest issues (one principal investigator was employed by the

excluded CHC) and another because the CHC employed only physician assistants rendering patient care.

The target population for the CHC CAQ was (i) the CHC administrator and (ii) physician leaders in these CHCs who had responsibilities for recruitment and retention activities. The physician leaders were selected in consultation with the CHC administrator. The recruitment of these individuals was done by phone and email by a family physician with physician recruiting experience and was supported by the Idaho Primary Care Association. There were 11 CHC administrators and 11 CHC physicians in the final sample for a total of 22 respondents.

Survey administration

Cross-sectional structured interviews were conducted in the study. The CHC administrators and physicians who agreed to participate in the study were mailed the CHC CAQ and a consent form after agreeing to participate in the study. A family physician with physician recruiting experience traveled to each participating community to administer the CHC CAQ. One-hour interviews were scheduled for each participant. Community Health Center administrators and physicians were interviewed separately and in private locations. Prior to the interviews, the consent form was reviewed with and signed by the participants. The CHC CAQ was completed during these structured interviews.

Data processing and analysis

The completed CHC CAQs were processed at Boise State University by researchers who entered these data into a Statistical Package for Social Sciences database. The qualitative questions were reviewed by the co-principal investigators and these responses are discussed in the Results section. Statistical Package for Social Sciences v17 (www.spss.com) was used for the statistical analysis. Descriptive statistics were used to organize respondent ratings to factors on the CHC CAQ. Numerical scores were constructed to describe sections in the CHC CAQ that address advantages and challenges, importance and Apgar



scores. These score constructions are described more fully in the Results section. Descriptive statistics were employed to organize these results and Mann–Whitney *U*-tests were used for all tests of statistical significance reported in this research. These data have been stored in locked files and password protected hard drives at the Center for Health Policy at the College of Health Sciences, Boise State University and the Family Medicine Residency of Idaho. Access to the raw data has been limited to the principal investigators and qualified research staff.

Ethics approval

This research was approved by the Boise State University Human Subjects Institutional Review Board (#EX 199-09-120).

Results

As noted, 11 CHC administrators and 11 CHC physicians who had leadership roles in recruitment and retention participated in this study and completed a CHC CAQ in a structured interview format. The overall responses ($n=22$) for the CHC CAQ are provided (Table 1). The following sections describe the results for advantages and challenges ratings, importance ratings and Apgar scores by class.

CHC CAQ advantages and challenges findings

Respondents were asked to rate their community's perceived advantages and challenges for the 50 factors in five classes. These factors were rated on a 4-point Likert scale (major advantage, minor advantage, minor challenge, major challenge) and these scale values were converted into scores (major advantage = 2, minor advantage = 1, minor challenge = -1, major challenge = -2). Statistical differences of these scores by class were determined between respondent and community types.

The advantages and challenges mean scores for the five classes within the CHC CAQ are provided (Table 2). Table 2 also

contains *p* values for the statistical tests across occupation and community types. Class scores were calculated by summing scores across all 10 factors in a class. A summary score across classes was constructed by summing the class scores in the CHC CAQ. Medical support was identified as the highest community advantage followed by economic, geographic, facility/community support and scope of practice. There were no significant differences between CHC administrator and physician scores within or across classes. Comparisons between community types showed that A communities had significantly higher scores within four of the five classes (economic, $p=0.04$; geographic, $p=0.05$; facility/community support, $p<0.001$; and scope of practice, $p=0.05$) and across classes ($p=0.001$).

CHC CAQ importance findings

Respondents were asked to rate their perceived importance levels for the 50 factors in five classes. These factors were rated on a 4-point Likert scale (very important, important, unimportant, very unimportant) and these scale values were converted into scores (very important = 4, important = 3, unimportant = 2, very unimportant = 1). Statistical difference of these scores by class was determined between respondent and community types.

The importance mean scores for the five classes within the CHC CAQ are provided (Table 3). Table 3 also contains *p* values for the statistical tests across occupation and community types. Class scores were calculated by summing scores across all 10 factors in a class. A summary score across classes was constructed by summing the scores across classes in the CHC CAQ. Geographic was identified as the highest area of importance for the communities followed by medical support, scope of practice, economic and facility/community support. There were no significant differences between CHC administrator and physician scores either within or across classes. Comparisons between community types showed that B communities had significantly higher scores for the geographic class ($p=0.05$). There was no across class significant difference in scores for A and B communities.



Table 1: Distribution of responses across survey items

Class or factor	Advantages and challenges level n (%)				Importance n (%)			
	Major Advantage	Minor Advantage	Minor Challenge	Major Challenge	Very Important	Important	Unimportant	Very unimportant
	Geographic							
Access to larger community	8 (36)	7 (32)	7 (32)	0	7 (32)	15 (68)	0	0
Demographic: underserved/pay or mix	0	13 (59)	8 (36)	1 (5)	3 (14)	18 (82)	1 (5)	0
Housing (availability &/or affordability)	6 (27)	9 (41)	5 (23)	2 (9)	4 (18)	18 (82)	0	0
Schools	4 (18)	15 (68)	3 (14)	0	8 (36)	14 (64)	0	0
Social networking	4 (18)	9 (41)	9 (41)	0	6 (27)	16 (73)	0	0
Recreational opportunities	19 (86)	3 (14)	0	0	13 (59)	9 (41)	0	0
Spousal satisfaction	1 (5)	8 (36)	9 (41)	4 (18)	16 (73)	5 (23)	1 (5)	0
Shopping and other services	2 (9)	15 (68)	5 (23)	0	0	18 (82)	4 (18)	0
Climate	4 (18)	14 (64)	4 (18)	0	0	20 (91)	2 (9)	0
Perception of community	3 (14)	7 (32)	12 (55)	0	2 (9)	19 (86)	1 (5)	0
Economic								
Part-time opportunities	4 (18)	10 (45)	8 (36)	0	2 (9)	14 (64)	6 (27)	0
Loan repayment	8 (36)	13 (59)	1 (5)	0	12 (55)	10 (45)	0	0
Salary	1 (5)	11 (50)	8 (36)	2 (9)	18 (82)	4 (18)	0	0
Signing bonus/moving allowance	0	15 (68)	6 (27)	1 (5)	2 (9)	18 (82)	2 (9)	0
Length of contract flexibility	1 (5)	14 (64)	7 (32)	0	0	14 (64)	7 (32)	1 (5)
Perceived fiscal stability	3 (14)	17 (77)	2 (9)	0	2 (9)	17 (77)	3 (14)	0
Production incentive	0	12 (55)	8 (36)	2 (9)	1 (5)	11 (50)	10 (45)	0
Retirement package	3 (14)	18 (82)	1 (5)	0	1 (5)	20 (91)	1 (5)	0
CME benefit	3 (14)	17 (77)	2 (9)	0	4 (18)	17 (77)	1 (5)	0
Competition	2 (9)	13 (59)	6 (27)	1 (5)	9 (41)	13 (59)	0	0
Scope of practice								
Obstetrics: prenatal care	1 (5)	11 (50)	10 (45)	0	13 (59)	9 (41)	0	0
Obstetrics: deliveries/C-section	1 (5)	13 (59)	5 (23)	3 (14)	15 (68)	7 (32)	0	0
Inpatient care	1 (5)	13 (59)	8 (36)	0	4 (18)	18 (82)	0	0
Emergency/stabilization care	0	17 (77)	4 (18)	1 (5)	2 (9)	19 (86)	1 (5)	0
Minor trauma (casting/suturing)	1 (5)	20 (91)	1 (5)	0	1 (5)	20 (91)	1 (5)	0
Office GYN procedures	1 (5)	14 (64)	7 (32)	0	1 (5)	21 (96)	0	0
Mental health	0	8 (36)	8 (36)	6 (27)	6 (27)	15 (68)	1 (5)	0
Mid-level supervision	2 (9)	14 (64)	6 (27)	0	0	20 (91)	2 (9)	0
Teaching	4 (18)	15 (68)	3 (14)	0	1 (5)	20 (91)	1 (5)	0
Administration	0	13 (59)	9 (41)	0	0	19 (86)	3 (14)	0
Medical support								
Perception of quality	1 (5)	21 (96)	0	0	9 (41)	12 (55)	1 (5)	0
Stability of physician workforce	1 (5)	17 (77)	2 (9)	2 (9)	8 (36)	14 (64)	0	0
Specialist availability	3 (14)	9 (41)	8 (36)	2 (9)	3 (14)	19 (86)	0	0
Nursing workforce	0	12 (55)	10 (45)	0	5 (23)	17 (77)	0	0
Mid-level provider workforce	2 (9)	19 (86)	1 (5)	0	1 (5)	20 (91)	1 (5)	0



Table 1: Cont'd

Class or factor	Advantages and challenges level n (%)				Importance n (%)			
	Major	Minor	Minor	Major	Very	Important	Unimportant	Very
	Advantage	Advantage	Challenge	Challenge	Important			unimportant
Ancillary staff workforce	2 (9)	18 (82)	2 (9)	0	1 (5)	20 (91)	1 (5)	0
Pharmacy services	2 (9)	10 (45)	10 (45)	0	1 (5)	17 (77)	4 (18)	0
Allied mental health workforce	3 (14)	14 (64)	4 (18)	1 (5)	10 (45)	11 (50)	1 (5)	0
Language services support	4 (18)	14 (64)	4 (18)	0	2 (9)	14 (64)	6 (27)	0
Call/practice coverage	11 (50)	5 (23)	2 (9)	4 (18)	19 (86)	3 (14)	0	0
Facility and community support								
Physical plant and equipment	3 (14)	9 (41)	10 (45)	0	3 (14)	17 (77)	2 (9)	0
Plans for capital investment	1 (5)	16 (73)	5 (23)	0	1 (5)	17 (77)	4 (18)	0
Electronic medical records	4 (18)	8 (36)	9 (41)	1 (5)	0	22 (100)	0	0
CHC leadership	2 (9)	15 (68)	5 (23)	0	2 (9)	18 (82)	2 (9)	0
Televideo support	0	5 (23)	14 (64)	3 (14)	0	5 (23)	15 (68)	2 (9)
Community need/support of physician	5 (23)	14 (64)	3 (14)	0	6 (27)	16 (73)	0	0
Welcome and recruitment program	0	13 (59)	9 (41)	0	0	21 (96)	1 (5)	0
Medical reference resources	1 (5)	17 (77)	4 (18)	0	2 (9)	20 (91)	0	0
Delegated physician patient services	5 (23)	8 (36)	7 (32)	2 (9)	2 (9)	20 (91)	0	0
Moonlighting opportunities	1 (5)	17 (77)	3 (14)	1 (5)	0	12 (55)	10 (45)	0

CHC, Community Health Center; CME, continuing medical education; C-section, Caesarean section; GYN, gynecology.

Table 2: Community advantages and challenges mean scores by class

Survey class	Overall score†	Administrator score (n=11)	Physician score (n=11)	P‡	A Community score (n=14)	B Community score (n=8)	P‡
Medical support	6.18	6.64	5.73	0.29	7.64	3.63	0.10
Economic	5.86	7.09	4.64	0.09	7.21	3.50	0.04*
Geographic	5.73	6.00	5.45	0.64	7.86	2.00	0.05*
Facility & community support	3.77	4.73	2.82	0.34	6.29	-0.63	<0.001**
Scope of practice	3.59	3.91	3.27	0.72	5.14	0.88	0.05*
Sum of mean scores across classes	25.14	28.36	21.91	0.37	34.14	9.38	0.001**

†Higher scores indicate greater community advantage (N=22); ‡Mann-Whitney U statistical test employed to test for differences between administrator and physician scores and for differences between A and B community scores.

*p < 0.05, **p < 0.01



Table 3: Community importance mean scores by class

Survey factor	Overall score [†]	Administrator score (n=11)	Physician score (n=11)	<i>P</i> [‡]	A Community score (n=14)	B Community score (n=8)	<i>P</i> [‡]
Geographic	32.27	32.18	32.36	0.89	31.86	33.00	0.05*
Medical support	32.05	32.09	32.00	0.79	32.29	31.63	0.53
Scope of practice	31.55	31.18	31.91	0.44	31.79	31.13	0.40
Economic	30.86	31.18	30.55	0.56	30.64	31.25	0.34
Facility & community support	29.00	28.73	29.27	0.44	28.93	29.13	0.60
Sum of mean scores across classes	155.73	155.36	156.09	0.37	155.50	156.13	0.78

[†]Higher scores indicate greater community importance (N=22); [‡]Mann-Whitney *U* statistical test employed to test for differences between administrator and physician scores and for differences between A and B community scores.

p* < 0.05, *p* < 0.01

CHC CAQ Apgar findings

The following algorithm was used to calculate the Community Apgar score from advantage/challenge and importance scores: Community Apgar score = advantage/challenge score × importance score. The Community Apgar score ranges from -8 to 8 with a higher score indicating a more developed community asset and capability related to recruitment and retention of physicians. Statistical difference of these scores by class was determined between respondent and community types.

The mean Community Apgar scores for the five classes within the CHC CAQ are provided (Table 4). Table 4 also contains *p* values for the statistical tests across occupation and community types. Class scores were calculated by summing scores across all 10 factors in a class. A summary score across classes was constructed by summing the scores across classes in the CHC CAQ. Medical support was identified as the most significant community asset and capability followed by economic, geographic, facility/community support and scope of practice. There were no significant differences between CHC administrator and physician scores either within or across classes. Comparisons between community types showed that A communities had significantly higher scores within four of five classes (economic, *p*=0.01; geographic,

p=0.04; facility/community support, *p*=0.001; and scope of practice, *p*=0.05) and across classes (*p*=0.001).

The cumulative Apgar scores for alpha and beta communities are provided (Table 5). Cumulative Apgar scores are a sum of the Apgar scores for each of the five classes in the instrument. The cumulative Community Apgar scores range from 389 to -44. Higher scores indicate greater community assets and capabilities. Generally, alpha communities have higher scores than beta communities.

Qualitative results

The CHC CAQ contains three open-ended questions. Respondents were asked to identify the greatest barriers to recruitment and retention of family medicine physicians and potential solutions to overcome these barriers. They were also asked to identify the reasons why a successful physician candidate did not accept a position in the community and what that candidate ultimately did instead in terms of employment. The answers to these questions suggested that the CHC CAQ included all relevant variables related to recruitment and retention of physicians to rural communities.



Table 4: Community Apgar mean scores by class

Survey class	Overall score†	Administrator score (n=11)	Physician score (n=11)	P‡	A Community score (n=14)	B Community score (n=8)	P‡
Medical support	20.77	22.00	19.55	0.34	26.29	11.13	0.09
Economic	19.14	23.18	15.09	0.11	23.71	11.13	0.01**
Geographic	18.68	19.55	17.82	0.69	25.57	6.63	0.04*
Facility & community support	12.50	15.45	9.55	0.32	20.07	-0.75	0.001**
Scope of practice	11.23	11.82	10.64	0.77	16.29	2.38	0.05*
Summary score across classes	82.32	92.00	72.64	0.45	111.93	30.50	0.001**

†Maximum score = 8; Minimum score = -8. Higher scores indicate greater community assets and capabilities (N=22); ‡Mann-Whitney U statistical test employed to test for differences between administrator and physician scores and for differences between A and B community scores.

*p < 0.05, **p < 0.01

Table 5: Cumulative community Apgar score by facility

Factors			Survey classes				
Facility code	Community type	Overall Apgar score†	Geographic	Economic	Scope of practice	Medical support	Facility & community support
1	A	389	87	69	64	113	56
6	A	256	44	43	62	53	54
7	A	241	48	46	44	44	59
5	A	199	57	56	40	34	12
11	A	189	39	35	30	25	60
8	B	176	78	31	20	54	-7
10	A	149	25	39	17	48	20
2	A	144	58	44	-29	51	20
9	B	112	8	41	27	32	4
3	B	0	-26	0	2	19	5
4	B	-44	-7	17	-30	-16	-8

†Higher scores suggest greater community assets and capabilities.

Discussion

Community health centers need tools to help them identify their communities' assets and capabilities related to physician recruitment, and that allow them to objectively identify strengths and opportunities for improvement. Previous workforce research on critical access hospitals produced an evaluation instrument (CAH CAQ) utilizing measurement classes (ie geographic characteristics, economic issues, medical support, scope of practice and hospital/community support) that have been found to be influential to physicians

when deciding where to practice medicine. The purpose of this article is to report the findings from the validation research performed on the CHC CAQ during the development of this evaluation instrument. The CHC CAQ was developed to help CHCs assess and differentially diagnose the strengths and challenges of an individual community related to physician recruitment. This instrument also provides the opportunity for a community to gain peer comparison and time sequence comparison analysis. The results of this investigation may help CHCs in Idaho and other



regions of the country to develop more effective recruitment strategies.

In these 11 Idaho communities, results regarding advantages and challenges identified medical support as the most advantageous class for physician recruitment followed by economic, geographic, facility/community support and scope of practice. For each class, there were no significant differences between CHC administrator and physician responses, demonstrating internal consistency in the identification of advantages and challenges for each factor. Significant differences in class and overall scores were seen between communities identified as alpha or beta for every class except medical support. Even then, alpha communities scored higher than beta communities for this class. These results suggest that the CHC CAQ consistently measures community assets and capabilities and correlates to historical experience in workforce trends for a particular community.

The results regarding importance highlighted geographic as the most important class for physician recruitment followed by medical support, scope of practice, economic and facility/community support. Comparison of community importance class scores between CHC administrator and physician responses identified no significant differences. Thus, all the respondents consistently recognized the classes important in recruitment and retention. On the other hand, one significant difference in importance levels of CAQ classes was observed between alpha and beta communities. Overall by category, beta communities gave greater importance scores to the geographic class. This is likely a result of the beta communities being more rural or isolated geographically. Generally, however, the overall importance scores demonstrated no practical difference between either the alpha and beta communities or between the administrator and physician respondents.

The overall rank ordering of classes by mean Community Apgar scores in these Idaho communities was as follows: medical support, economic, geographic, facility/community support and scope of practice. This may reflect the structure and financing of the CHC entities being better supported for

their provision of a more limited scope of services as compared to critical access hospitals, while facing similar overall pressures for recruiting physicians as their critical access hospital facility counterparts. There are statistically significant differences within all classes and across classes with the exception of medical support, where alpha communities consistently scored higher on mean Community Apgar scores. Again, the presence of less of a difference between alpha and beta CHC communities across the medical support class may be in part due to the scope of services and their organization as CHCs. Caution should be exercised, however, given the limited sample size, which makes further investigation of this point necessary. Statistical differences were not found by respondent type within any class or across classes.

A review of the cumulative Community Apgar score by facility results suggest that the CHC CAQ consistently both quantifies self-report of community assets and capabilities and furthermore correlates to historical experience in workforce trends for a particular community. While 'Community 8' scored higher than two of its alpha counterparts, the trend clearly identifies a gradient effect between the higher scoring alpha communities and the lower scoring beta communities. The phenomenon of these findings can be explained by at least two observations. First, communities do not remain static within their historical categorization of alpha or beta but do in fact improve (or devolve) in their abilities and assets. Second, this study enrolled all eligible CHCs with a gradient from alpha to beta that was defined in relative terms to one another. The prior study of critical access hospitals referenced earlier in this report was a sample of 11 alpha and beta communities selected from a total of 26 critical access hospitals which allowed the researchers to identify facilities that were clearly more or less successful in physician recruitment. This selection provided a sharper distinction in Community Apgar Scores as communities that were neither clearly alpha or beta and were not included in the sample.

One of the limitations of this study was the small number of sample communities. The target communities for the CHC CAQ were all CHCs in Idaho and one site was chosen per



CHC if the CHC had multiple service locations. Although a careful selection process was introduced to assure the quality of samples, they may have been biased and may not represent the target population. Another limitation of this study was the data collection method. Because the face-to-face interview method was used in the study, a response bias may have occurred. In addition, although the use of non-parametric tests was appropriate considering the sample size and the format of the instrument, some significant relationships may not have been detected due to the limited statistical power. Finally, the CHC CAQ may not have captured all relevant factors related to physician recruitment to CHCs. An examination of the qualitative questions in the CHC CAQ indicated that respondents did not identify any additional variables of interest.

Conclusion

Similar to the critical access hospital CAQ study, the CHC CAQ seems to not only discriminate between communities with greater assets and capabilities and those with lesser assets and capabilities but also to accurately correlate to historical community-specific workforce trends. This assessment may allow for identification of both modifiable and non-modifiable factors and also may suggest which factors are most important for a community to address with limited available resources. The CHC CAQ may also have a role to play in a community's self-evaluation, prioritization of improvement plans, advertising considerations and negotiation strategy for successful recruitment and retention of physicians.

Following the work already underway in critical access hospital communities, this tool may also be used to share successful strategies communities have implemented to overcome disadvantages that may be difficult or impossible to modify. The ongoing study of both community health center and critical access hospital community settings in the framework of the Community Apgar Questionnaire and the associated Community Apgar Program, focused on making improvements from the obtained information, will provide both cross-study data between these settings as well as ongoing temporal data for identification of longitudinal

trends, aggregate analysis and targeted individual community benefit. The development of an aggregate CHC CAQ national database composed of multiple state data sets will allow for comparison and contrast of factors important to physician recruitment and retention both within and between states. For example, it may be useful to assess across states or within regions the differential impact of (i) the common finding of unmet mental health needs; (ii) how the quality of schools effect physician recruitment to rural communities; (iii) physician loan repayment, salary and production issues; and (iv) the changes regarding internet availability and electronic medical records. The results of such studies could inform regional and national leaders and policy makers as they craft legislative efforts, educational programming models or other approaches to addressing physician shortages to underserved communities.

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Appendix I: Community Health Center Community Apgar Questionnaire

Site Code: _____

Subject Code: _____

Instructions: The interviewer will ask the subject to assess how each of the following factors, organized into five classes, impacts recruitment and retention of Family Medicine physicians in their community health center. Each factor will be rated on two dimensions: relative advantage or challenge for their community and relative importance to recruiting Family Medicine physicians to the community.

Class/Factor	Major Advantage	Minor Advantage	Minor Challenge	Major Challenge	Very Important	Important	Unimportant	Very Unimportant
Geographic								
Access to larger community								
Demographics: Underserved/ Payor mix								
Housing (availability &/or affordability)								
Schools								
Social networking								
Recreational opportunities								
Spousal satisfaction (education, work, general)								
Shopping and other services								
Climate								
Perception of community								
Economic								
Part-time opportunities								
Loan repayment								
Salary (amount)								
Signing bonus/ moving allowance								
Length of contract flexibility								
Perceived fiscal stability								
Production incentive								
Retirement package								
CME benefit								
Competition								



Scope of Practice								
Obstetrics: parental care								
Obstetrics: deliveries/C-section								
Inpatient care								
Emergency/ stabilization care								
Minor trauma (casting/suturing)								
Office GYN procedures								
Mental health								
Mid-level supervision								
Teaching								
Administration								
Medical Support								
Perception of quality								
Stability of physician workforce								
Specialist availability								
Nursing workforce								
Mid-level provider workforce								
Ancillary staff workforce								
Pharmacy services								
Allied mental health workforce								
Language services support								
Call/practice coverage								
Facility and Community Support								
Physical plant and equipment								
Plans for capital investment								
Electronic medical records (EMR)								
CHC leadership								
Televideo support								
Community need/support of physician								
Welcome and recruitment program								



Medical reference resources									
Delegated physician patient services									
Moonlighting opportunities									

Open-ended questions

1. What are your greatest barriers to recruitment and retention of Family Medicine physicians?

2. What can be done to overcome these barriers?

3. What reasons has a successful physician candidate given for not accepting a position in the community? What did that person ultimately do instead (if you know)?



Appendix II: Community Health Center Community Apgar Questionnaire glossary of terms

Geographic Class Factors

Access to larger community

The ability to access or ease of access to a larger community

Demographics: Underserved / Payor mix

The demographics of patients in the community including ability to access recommended or rendered care, age, gender, race or other

Housing (availability &/or affordability)

The availability and affordability of desirable housing as viewed by physicians

Schools

Adequacy of schools for the physician's children

Social networking

Opportunities or ease of socializing for the physician and family

Recreational opportunities

Opportunities for local, enjoyable non-work time activities

Spousal satisfaction (education, work, general)

Overall satisfaction of the spouse in regard to local community living such as education, work, and in general

Shopping and other services

Adequacy of local access to shopping or services for physician and family

Climate

Weather

Perception of community

Perception of the community overall by someone not from the community

Economic Class Factors

Part-time opportunities

Whether or not a desire for part-time work status is available or supported

Loan repayment

Whether or not loan repayment is available for qualifying physician

Salary (amount)

The competitiveness of the overall end-of-year physician earnings

Signing bonus / Moving allowance

Whether or not a signing bonus is available for new physician and whether or not a moving allowance is available for new physician

Length of contract flexibility

Whether or not a physician can expect flexibility with regard to the length in term of a working agreement or contract



Perceived fiscal stability

The degree of perceived financial stability of the hiring CHC institution

Production incentive

The existence and favorability of a production incentive for physician work and income

Retirement package

The existence and favorability of a physician retirement package or program

CME benefit

The existence and favorability of a Continuing Medical Education benefit and/or program

Competition

The sense of competition amongst primary care providers for patients and resultant environment for sharing care between physicians

Scope of Practice Class Factors

Obstetrics: Prenatal care

The impact of whether or not prenatal care obstetrics is an option, not an option, or mandatory.

Obstetrics: Deliveries / C-section

The impact of whether or not vaginal deliveries and/or C-Sections is an option, not an option, or mandatory.

Inpatient care

The impact of whether or not inpatient hospital care is an option, not an option, or mandatory.

Emergency / Stabilization care

The impact of whether or not ER or stabilization and transfer coverage is an option, not an option, or mandatory.

Minor trauma (casting/suturing)

The impact of whether or not minor trauma care such as casting or suturing is an option, not an option, or mandatory.

Office GYN procedures

The impact of whether or not office GYN procedures such as colposcopy and/or LEEP is an option, not an option, or mandatory.

Mental health

The impact of whether or not mental health care by the physician is an option, not an option, or mandatory.

Mid-level supervision

The impact of whether or not mid-level supervision by the physician is an option, not an option, or mandatory.

Teaching

The impact of whether or not teaching residents or medical students by physicians is an option, not an option, or mandatory.

Administration

The impact of whether or not administrative duties for the physician is an option, not an option, or mandatory.

Medical Support Class Factors

Perception of quality

The overall reputation for quality of medical care for this community as seen by someone not from this community



Stability of physician workforce

The stability of the physician workforce and longevity of the retained physicians

Specialist availability

The availability of specialists and sub-specialist for patient care; either on site or by other means

Nursing workforce

The adequacy of nursing workforce for both quantity and quality

Mid-level provider workforce

The adequacy of mid-level provider for both quantity and quality

Ancillary staff workforce

The adequacy of ancillary staff (such as laboratory, x-ray technician, respiratory therapy, physical therapy, occupational therapy) workforce for both quantity and quality

Pharmacy services

The availability and adequacy of pharmacy services for CHC patients

Allied mental health workforce

The adequacy of allied mental health workforce for both quantity and quality

Language services support

The availability and adequacy of language support services for CHC patients

Call / Practice coverage

The adequacy of call coverage and practice coverage for physician leave, holidays and vacation

Facility and Community Support Class Factors

Physical plant and equipment

The current adequacy of the facility physical plant and equipment

Plans for capital investment

The adequacy of the CHC institutional plans for capital investment in the facility

Electronic medical records (EMR)

The existence and adequacy of electronic medical records in the facility environments

CHC leadership

The adequacy of CHC leadership including the administrators and CHC board functions

Televideo support

The existence and adequacy of televideo capability in the community for patient care or other communications

Community need / Support of physician

The perceived sense of need for and/or community support of a new physician

Welcome and recruitment program

The existence and adequacy of any recruitment plan and/or welcome for an interviewing or newly recruited physician

Medical reference resources

The adequacy and quality of medical reference resources for physician use in patient care



Delegated physician patient services

The adequacy and quality of task performance when physicians appropriately delegate an aspect of patient service

Moonlighting opportunities

The availability and quality of local physician work opportunities outside of the routine CHC provision of care
