

DEFINING A BUSINESS CASE FOR MEASURING AND ADDRESSING DISPARITIES IN HEALTH CARE: EVIDENCE FROM KING COUNTY

Poor health care quality impacts employers financially in two major areas^{1,2} — direct costs of health care and indirect costs related to absenteeism, turnover, and reduced productivity.^{3,4} Also, studies have also shown that members of racial/ethnic minority groups disproportionately experience lower-quality health care than Whites.⁵ Identifying these gaps in quality and disparities in care and designing appropriate interventions should lead to both short- and long-term savings for employers.

Some employers have taken action towards improving health care quality and eliminating health disparities — for example, Verizon Communications, after noticing racial/ethnic disparities in health care treatment, worked with health plans to address these disparities.⁶ However, a recent survey revealed that little more than half of employers recognize the existence of health disparities.⁷ And even when recognized, many continue to perceive racial/ethnic health disparities as a fairness or equity problem, not necessarily a *business* problem.

Making the business case for measuring and improving quality by addressing racial/ethnic health disparities has been challenging due to the lack of data demonstrating how these disparities directly affect health care costs and worker outcomes, such as productivity and absenteeism. To address this issue, staff from the High-Value Health Care Project worked with King County, Washington — a self-insured employer — on a pilot project. The effort explored how employer data can be linked with claims data to develop equity reports and begin measuring the relationship between health care inequality and indirect costs to employers.

This paper illustrates how King County was able to obtain data on race and ethnicity, and then link that data, as well as data on absenteeism and productivity, with claims data. This provided the ability to determine the quality of care their employees receive, as well as whether inequalities in health care directly affect outcomes and indirect costs.

LINKING DATA TO MEASURE IMPACTS ON QUALITY AND COST

With no existing database linking data to examine relationships between quality, disparities, and workplace outcomes, the King County project offered an unprecedented opportunity to examine the business impact of quality and health disparities. It sought to answer a number of key questions, including:

- Do racial/ethnic disparities in health care quality exist among King County employees?
- Are there associations between poor quality care in specific measures and increased absenteeism or decreased productivity?
- Are racial/ethnic gaps in care quality associated with increased absenteeism and/or decreased productivity?

Using data from approximately 17,000 employees and dependants, researchers developed an integrated database of self-reported race and ethnicity, absenteeism, and productivity data from insurance claims data and King County's Health Risk Assessment (HRA) survey. The HRA is an annual survey of those covered under King County's medical

plans — employees and “spartners,” or employees’ spouses or partners. It includes questions on race and ethnicity, personal health/medical history, and also non-health questions like job category and absenteeism or productivity. Nationally-vetted quality measures and quality algorithms were applied to the dataset to examine potential relationships between quality of care, disparities in quality, and workplace outcomes.

Using HRA Data

Researchers used the following questions from the HRA data set in their analyses:

1. Race and ethnicity
2. Absenteeism/productivity:
 - In the past 12 months, how many days of work have you missed due to illness? (Web version)
 - During the past 4 weeks, how many hours did you miss from work because of your health problems?
 - During the past 4 weeks, how much did your health problems affect your productivity while you were working? (Web version) (0-10 rating scale)

Applying Quality Measures

The analysis of racial/ethnic disparities in quality of care used the entire set of quality measures that could be calculated from the claims data set.⁸ To determine an association between quality of care and absenteeism and productivity, researchers focused on a set of three to five National Quality Forum-endorsed performance measures selected based on sample size, and the potential relationship between that quality-of-care parameter and absenteeism/productivity as reported in the HRA survey. Researchers focused on measures of quality of care for patients and dependents with asthma, depression, or cardiac disease, since poor quality care for these conditions could conceivably lead to recurrence, and ultimately absenteeism or productivity loss.

Analysis to Determine Disparities

Data on race and ethnicity were analyzed according to the major categories offered as response options on the HRA. Children who did not complete an HRA were assigned the racial/ethnic group of their parents, except in cases where two parents did not report the same category. In cases where one parent reported a race/ethnicity and another reported “other” or did not

report at all, children were assigned the race/ethnicity of the parent who provided the information. Children of parents who identified themselves as multi-racial, or reported different single race/ethnicity categories were categorized as multi-racial.

To answer the research questions, it was necessary to link the clinical quality measures with HRA race and ethnicity data. In addition to the standard performance rate output on the list of clinical quality measures, researchers received “intermediate analysis” tables that included individual-level listings of employees in the numerator and denominator of each calculated performance rate. Researchers also linked the unique identifier of employees in the denominator for each measure with the information on race and ethnicity from the HRA data set. For measures of quality of care in children, researchers followed the same protocol. See Table 1 in the Appendix for more on the process of analyzing claims and HRA data.

PILOT PROJECT RESULTS

The pilot project revealed that King County employees generally experienced high quality of care on most performance measures. This made it difficult to observe relationships between quality of care and absenteeism and productivity. The analysis did, however, reveal significant disparities in asthma medication use, with African-American patients less likely than other groups to receive adequate medication (see Appendix, Table 2).

Quality of Care and Indirect Costs to Employers

The findings on the relationship between quality of care and self-reported absenteeism focused on measures where a link between them was plausible in a one-year period. Measures analyzed included adequate medication treatment for asthma and adequate lipid management medication among patients with cardiac disease.

In general, no consistent patterns were observed, either for “same year” or “one-year lag” relationships. Researchers were able to identify individual measures and individual calendar years in which poor quality care was associated with greater absenteeism or reduced productivity, as well as individual measures and years when such a relationship did not occur. Still, no significant association was found between

quality of care and absenteeism and productivity in this particular set of quality measures. A relationship did exist in the analysis conducted on measures of adequacy of depression medication treatment, since that measure seemed most likely to show a relationship between quality of care and absenteeism and productivity (see Appendix, Table 3).

Results of the GEE analyses of the relationship between productivity measures and depression care showed significant interaction between year and met criteria among employees and spartners for illness at 12 months. In 2005 and 2006, both employees and spartners who met criteria missed more days of work, on average, compared to those who did not meet criteria. Among employees, there was a significant interaction for illness at four weeks. Results indicated that in 2006, employees who met criteria missed more days of work compared to employees who did not meet criteria. Finally, among spartners, there was a significant interaction for productivity. Although there were no significant differences in productivity between those who did and did not meet criteria by year, there were significant differences over time. Among those who met criteria, the mean productivity measure decreased significantly over time. However, among those who did not meet criteria, no trends over time were observed (see Appendix, Table 4).

Limitations

The analyses revealed instances where poor quality of care was associated with greater absenteeism or reduced productivity, but it was also possible to identify individual measures and years in which a relationship in the opposite direction occurred.

In addition, the similar patient population, small sample sizes, and availability of a limited number of performance measures that could be plausibly linked to absenteeism and productivity proved challenging, and resulted in the absence of many statistically significant relationships between quality, disparities, and absenteeism and productivity.

Recommendations for Other Employers and Communities

Future efforts to measure and address disparities in health care should consider the following:

Use Larger, Detailed Data Sets

- Larger data sets — perhaps involving data from multiple employers or a multi-employer

purchasing collaborative, such as the Puget Sound Health Alliance — would allow for larger sample sizes to analyze disparities in care as well as their effect on employer outcomes.

- Future analyses should use data sets with more measures of quality of care for individuals with chronic conditions or other serious conditions like depression or cardiac disease. These measures could allow for a better understanding of health care disparities, the effect of poor health care quality on absenteeism or productivity, and the racial/ethnic gaps in care quality associated with these worker outcomes.

Understand the Available Data

- Employers should know whether they have employee race and ethnicity data, and also know the level of granularity of that data. If they do not have such data, employers should consider the best way to collect it in a standardized manner.
- Employers should determine the performance measures that are of most interest to them. These measures can then be stratified by race and ethnicity to determine whether disparities exist. For King County, being a self-insured employer allowed them access to the employee claims data that was necessary to identify the performance measures that could be stratified by race and ethnicity. Other employers may want to consider working with their health plan(s) to obtain claims data and conduct analyses using race and ethnicity data.

Construct the Right Database

- Some technical problems arose during the construction of the King County database. While HRA data contained the race/ethnicity data for employees and spartners, no race and ethnicity data was available for child dependants. Employers should develop a strategy for assigning race and ethnicity to children based on available data.

Analyze Appropriate Measures

- Not all measures in the King County project were appropriate for determining racial/ethnic disparities in care. Employers should only stratify measures known to disproportionately affect minority populations. For example, the National Quality Forum has endorsed a number of

“disparities-sensitive” ambulatory care measures that could be used in assessing health care disparities.⁹

- For certain measures, poor quality of care may not lead immediately to increased absenteeism and/or decreased productivity, such as cervical cancer screening. It is important to select measures in which poor quality of care can lead – almost immediately – to problems in either attendance or productivity.

CONCLUSION

Results neither confirmed nor refuted hypotheses about a relationship between disparities in quality and indirect costs to employers. However, the successful methodology used in the pilot study shows the potential that exists for others interested in further examining these issues. The King County experience offers a replicable and feasible approach for employers, policymakers, health plans, and others to use in determining whether racial/ethnic health care disparities affect workplace outcomes.

-
1. Bodenheimer, T, Wagner, EH, & Grumbach, K. Improving primary care for patients with chronic illness: The Chronic Care Model, Part 2. *JAMA*, 2002, 288(15), 1909-1914.
 2. Dimick, JB, Weeks, WB, Karia, RJ, et al. Who pays for poor surgical quality? Building a business case for quality improvement. *J Am Coll Surg*, 2006, 202, 933-937.
 3. Goetzel, RZ, Ozminkowski, RJ, Sederer, LI, & Mark, TL. The business case for quality mental health services: Why employers should care about the mental health and well-being of their employees. *J Occup Environ Med*, 2002, 44, 320-330.
 4. Rost, K, Smith, JL, & Dickinson, M. The effect of improving primary care depression management on employee absenteeism and productivity: A randomized trial. *Medical Care*, 2004, 42, 1202-1210.
 5. Smedley BD, Stith AY, Nelson AR, eds. 2002. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Institute of Medicine, Washington DC. National Academies Press.
 6. Weinstock, Britt. *Why Companies are Making Health Disparities Their Business: The Business Case and Practical Strategies*. National Business Group on Health, 2003.
 7. Rosenthal, M.B., B.E. Landon, S.T. Normand, et al. “Engagement of Health Plans and Employers in Addressing Racial and Ethnic Disparities in Health Care.” *Medical Care Research and Review*, vol. 66, 2009, pp.219-231.
 8. Calculations performed by Milliman, a large independent actuarial and consulting firm that manages the health claims/utilization database for the Puget Sound Health Alliance, of which King County is a part.
 9. National Quality Forum. *National Voluntary Consensus Standards for Ambulatory Care –Measuring Healthcare Disparities*. 2008

APPENDIX OF TABLES

Table 1. Process of Analyzing Claims and HRA Data

Action	Description
Calculate Performance Rate	For each measure, a performance rate was calculated, and stratified by race/ethnicity that allowed comparison of quality of care across as many racial/ethnic groups that there were adequate sample sizes for. An overall chi square statistic was calculated for each measure for all groups in order to determine whether any differences in rates were statistically significant; however, when working to identify disparities affecting specific groups, researchers generally restricted attention to groups and measures for whom the denominator size was 30 or more. For example, if there were 100 white women in the denominator for the cervical cancer screening, 52 African-American women in the denominator for the same measure, and only 19 Asian women in the denominator for that measure, it was possible to examine Black-White differences, but not Asian-White differences.
Determine Quality of Care Disparities	For measures with significant overall racial disparities, pair-wise Fisher’s exact tests were performed in order to determine specific racial differences in quality of care. For example, an overall racial difference in use of asthma medications for adult patients was detected in 2006. Pair-wise comparisons were then performed in order to determine which races had significantly lower asthma medication usage.
Examine Association Between Quality and Worker Outcome Measures	Across all racial/ethnic groups, researchers examined associations between quality of care and measures of absenteeism and productivity. Specifically, researchers compared measures of absenteeism and productivity for those who received recommended care versus those who did not. The association between productivity measures and depression (Antidepressant Medication Management, effective continuation phase treatment) was tested using Poisson regression modeling with generalized estimating equation (GEE) methods. These methods were used to adjust for the correlation among the repeated measurements over time. Models were run separately for spartner and employee productivity measures. The interaction between meeting criteria (yes versus no) and time was tested. If significant at $p < 0.10$, then pairwise comparisons of met criteria versus did not meet criteria by year were made. If no significant interaction was found, researchers tested for main effects.
Link to Children	For claims from children ages 18 or younger, such as asthma patients ages five-nine, productivity measures of the employee and spartner in the same family were obtained by linking the family unit identifier.
Account for “Lag Intervals”	Researchers examined as many “lag intervals” in associations between quality of care and HRA data as the data set allowed. That is, researchers examined associations between quality of care and HRA data in the same year, and with lags of either one or two years, if possible. Since HRA data were generally obtained in surveys in January of a specific year, and the HRA questions on absenteeism and productivity included an instruction to think back over the past year, the “same year” analyses actually involved claims data from one year and HRA data from the following January. Data with one year of lag would have involved, for example, claims data from 2005 and HRA data from January 2007.

Table 2. Percent of Eligible Patients who Received Recommended Service by Year: Overall and by Race and Ethnicity for Selected Quality Measures in Which Significant Disparities were Observed

Measure	Year	Overall	White	Black	Hispanic	Asian	Other
Breast Cancer Screening ages 42-51	2005	61.4	64.6 ^a	60.3	50.7	57.0	63.1
Cervical Cancer Screening	2006	71.3	73.5 ^{ab}	73.8	81.0	78.0	71.9 ^a
	2007	71.5	73.5 ^{ab}	73.7 ^a	82.5	77.3	72.9 ^a
Chlamydia Screening in Women 16-25	2007	36.2	33.1 ^c	53.7	29.4	39.0	38.6
Use of appropriate medications for asthma patients 5-56	2005	91.1	94.9 ^c	70.4	100.0	87.0	93.3
	2006	88.2	89.8 ^c	71.8	100.0 ^c	87.1	90.0
	2007	90.2	93.0 ^c	78.1	93.3	89.3	87.0

^aSignificantly different from Hispanic; $p < 0.05$ from Fisher's exact test.

^bSignificantly different from Asian; $p < 0.05$ from Fisher's exact test.

^cSignificantly different from Black; $p < 0.05$ from Fisher's exact test.

Table 3. Analysis of Relationship Between Quality of Care for Medication Management Among Patients with Depression
a. Employees

Condition	Year	HRA measure	Met criteria		Did not meet criteria	
Depression - Effective Continuation Phase Treatment	2005	Illness 12 months	30	6.4 (4.9)	27	4.7 (3.8)
		Illness 4 weeks	33	7.0 (16.3)	29	5.1 (9.4)
		Productivity	33	1.5 (2.1)	29	1.6 (2.5)
	2006	Illness 12 months	45	10.8 (22.6)	49	4.6 (4.4)
		Illness 4 weeks	50	9.6 (24.4)	49	3.1 (6.2)
		Productivity	50	1.9 (3.0)	50	0.9 (1.6)
	2007	Illness 12 months	47	5.5 (7.6)	38	5.6 (5.5)
		Illness 4 weeks	48	3.7 (6.9)	40	4.9 (11.8)
		Productivity	49	1.2 (1.6)	40	1.2 (2.4)

b. Spartners

Condition	Year	HRA measure	Met criteria		Did not meet criteria	
Depression - Effective Continuation Phase Treatment	2005	Illness 12 months	18	20.5 (70.0)	6	0.7 (0.8)
		Illness 4 weeks	16	6.3 (17.6)	7	1.1 (3.0)
		Productivity	17	2.7 (3.1)	7	0.3 (0.8)
	2006	Illness 12 months	20	6.6 (18.6)	13	3.3 (8.1)
		Illness 4 weeks	19	9.1 (36.6)	14	2.4 (8.0)
		Productivity	19	1.5 (2.6)	13	1.3 (2.7)
	2007	Illness 12 months	15	1.6 (1.6)	14	1.2 (2.7)
		Illness 4 weeks	15	1.1 (4.1)	15	0.3 (1.0)
		Productivity	15	0.2 (0.4)	14	0.6 (0.9)

Table 4. Results of GEE Analysis of Relationship Between Quality of Care and Absenteeism and Productivity for Patients with Depression

a. Employees

Outcome	Interaction p-value	2005	2006	2006
Illness 12 mos	0.0495	0.0067	0.0081	0.507
Illness 4 weeks	0.0481	0.46	0.0069	0.55
Productivity	0.140*	NA	NA	NA

b. Spartners

Outcome	Interaction p-value	2005	2006	2006
Illness 12 mos	0.0179	0.0002	0.376	0.55
Illness 4 weeks	0.95*	NA	NA	NA
Productivity	0.055	0.318	0.746	0.444