Catheter-Associated Urinary Tract Infections and Patient Perception of Care

Bonnie Rice

College of Public Health, University of South Florida

Author Note

This paper has not been presented anywhere and there are no conflicts of interest.

Correspondence concerning this article should be addressed to Bonnie Rice, College of Public Health, University of South Florida, 13201 Bruce B. Downs Blvd, MDC 56, Tampa, FL 33612. Contact: bhrice@usf.edu.

Competencies:

- Apply statistical reasoning and methods to address, analyze, and solve problems in public health
- Apply principles of evidence-based public health to assessment and prevention (primary, secondary, and tertiary) of public health issues
- Demonstrate effective written and oral skills for communicating with different stakeholders
- Identify and discuss risk factors and their relationships to health outcomes.
- Demonstrate proficiency in basic and intermediate epidemiologic methods and principles.
- Understand the application of epidemiologic methods in the design of experimental and observational studies with respect to sample selection, randomization, and power.
- Demonstrate proficiency in use of common statistical software packages for data analysis and appropriate interpretation of results.
- Use statistical techniques including descriptive statistics, data exploration, estimation, hypothesis testing, and modeling
- Develop written and oral presentations based on results of statistical and epidemiologic analyses
- Conduct a guided epidemiologic project or critical synthesis of the epidemiologic literature
- Synthesize and apply knowledge in the core areas of public health

Health Care-Associated Infections and Patient Perception of Care

Healthcare-associated infections (HAIs) are a major and growing problem in the United States and worldwide (Haque et al., 2018). HAIs are infections which were not present at time of admission, and so are acquired within the hospital, whether avoidably or not (Haque et al., 2018). In 2018, nearly 2 million patients acquired an HAI, and of those patients approximately 6% were killed by the infection (Haque et al., 2018).

Catheter-Associated Urinary Tract Infections

Important HAIs include central line-associated bloodstream infections, surgical site infections, and ventilator-associated pneumonia (Haque et al., 2018; Nicolle, 2014). Frequent microbial organisms of concern include *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Acinetobacter* species (Haque et al., 2018; Nicolle, 2014). The microorganisms associated with HAIs are often multidrug resistant (Haque et al., 2018; Nicolle, 2014). One of the most common types of HAI in the United States is catheter-associated urinary tract infections (CAUTIs), which in 2014 accounted for approximately 20% of health care-associated bacteremia in acute care settings (Backman et al., 2022; Centers for Disease Control and Prevention [CDC], 2015; Meddings et al., 2014; Nicolle, 2014). Of all urinary tract infections (UTIs), about 75% are associated with a urinary catheter (CDC, 2015). The use of urinary catheters is very common – approximately 15-25% of patients in hospitals receive a urinary catheter at some point in their care (Backman et al., 2022; CDC, 2015; Nicolle, 2014).

CAUTIs are generally a product of biofilm formation, which protects microorganisms such as *Escherichia coli* from antimicrobials (Nicolle, 2014). The urethra, bladder, ureters, and/or kidneys can be infected (CDC, 2015). The main risk factor for CAUTIs is length of catheter use, and the most important prevention method is limiting the use of and duration of use of in-dwelling urinary catheters (Backman et al., 2022; CDC, 2015; Meddings et al., 2014; Nicolle, 2014). Up to 50% of catheters may be in place unnecessarily, leading to an increased and avoidable risk of CAUTIs (Backman et al., 2022; Nicolle, 2014).

Strategies to reduce unnecessary catheter use include education on appropriate use, restrictions on improper use, routine reminders of the presence of the catheter, and stop orders requiring the removal of the catheter (Meddings et al., 2014). CAUTIs, like all HAIs, can lead to overall poor outcomes including increased morbidity, mortality, length of stay, and cost (Backman et al., 2022; Haque et al., 2018; Nicolle, 2014).

Patient Perception of Care

Multiple studies have investigated patient perception of care and its reflection on actual quality of care (Isaac at al., 2010; Kvist et al., 2014; Stein et al., 2015). In general, these studies have concluded that favorable perception of care and the hospital is associated with better actual quality metrics (Isaac at al., 2010; Kvist et al., 2014; Stein et al., 2015). There are few studies analyzing the association between patient perception of care and HAIs specifically, and those that do have generally investigated the patients' perception of care specifically for HAIs, rather than in the hospital overall (Burnett et al., 2010; Newton et al., 2001). One study very similar to this study analyzed the relationship of patient perception of timeliness of care and risk of central line-associated blood stream infections; however, this study was conducted in 2013, before the COVID-19 pandemic altered both perceptions and actual quality of healthcare (Saman et al., 2013). This study found that longer perceived response times were significantly associated with increased risk of central line-associated blood stream infections (Saman et al., 2013).

Timeliness of care is an important indicator of healthcare quality (Agency for Healthcare Quality and Research [AHQR], 2022; Saman et al., 2013). The goal of timely care is to reduce wait times and delays of care (AHQR, 2022). Participation in Medicare requires that a registered nurse is immediately available to provide patient care (Centers for Medicare & Medicaid Services [CMS], 2012; Saman et al., 2013). Timelines of care may be used as a reflection of nursing staff levels, which is in turn associated with quality of care and a hospital culture of safety (Saman et al., 2013).

Research Questions

Given that little is known about patient perception of care and its association with risk of HAI, multiple research questions may be proposed which can be analyzed with available data. One potential association is whether perception of cleanliness is associated with risk of methicillin-resistant *Staphylococcus aureus* (MRSA). Cleaning and disinfecting of environmental surfaces and equipment is essential to preventing HAIs, including MRSA (Green et al., 2006; Haque et al., 2018). Additional studies based on subjective perception of cleanliness, however, have found no association between the two (Green et al., 2006). As such, further research is necessary on the use of patient perception as a reflection of actual cleanliness. The association between patient perception of the explanation provided for the purpose of their medication and the risk of *Clostridioides difficile* infection is another possible research question. Antibiotic usage is a major risk factor for *C. difficile* infection, and it is possible that healthcare professionals who prescribe antibiotics without properly explaining the use and potential risk of these medications are also overprescribing them (Centers for Disease Control and Prevention [CDC], 2019).

The research question ultimately being proposed is: Is patient perception of timeliness of care (i.e., did they receive help when they asked for it?) associated with increased risk of CAUTIs hospital wide. Previous studies have shown that CAUTIs are associated with unnecessary and unnecessarily long urinary catheter use, which leads to the growth of biofilms (Nicolle, 2014). Quick response to patients' needs may reflect more attention being paid to the necessity of a urinary catheter, and thus lower CAUTI rates. Inversely, slow response time – as perceived by patients – may be associated with a greater risk of CAUTI. This research question was chosen for multiple reasons. Intuitively, longer perceived response times may reflect a lack of patient care for a variety of reasons, including understaffed hospitals or poor staff training. Patient perception of timeliness of care is a compelling exposure variable. CAUTI risk was chosen as the outcome variable due to the high incidence compared to other HAIs. In the case of all potential research questions, if patient perception does accurately reflect HAI rates in a hospital it could be a valuable resource for infection preventionists.

Methods

The data used for this study was pulled from the Centers for Medicare & Medicaid Services (CMS) datasets: 1) Hospital General Information, 2) Healthcare Associated Infections – Hospital, and 3) Patient survey (HCAHPS) – Hospital. The information in these datasets is provided by the Medicare registry, the National Healthcare Safety Network (NHSN), and the HCAHPS survey, respectively. All three datasets were merged to utilize hospital-wide demographic information, health care associated-infection measures, and patient perceptions of care. The sample for this analysis was restricted to hospitals which have no missing values for the relevant variables or for which there were no data issues as indicated by a footnote in the original datasets. Of the original population of hospitals, 2,136 (40.2%) were excluded for missing the overall rating variable, 602 (11.3%) were excluded for missing the timeliness variable, and 2,955 (55.6%) were excluded for missing the CAUTI SIR variable. Ultimately, 3,098 hospitals were excluded from the sample. The final sample included 2,219 of a total 5,317 hospitals.

The outcome of interest is CAUTI standardized infection ratio (SIR), which indicates whether the hospital has had more or less CAUTIs than expected in the given year and is included in the Healthcare Associated Infections – Hospital dataset (CMS, 2023). The SIR is calculated as Observed / Expected number of CAUTIs; the number of predicted infections is calculated based on the 2015 national HAI aggregate data and is adjusted for each facility, as calculated by NHSN (CDC, 2022). For CAUTIs, the predicted number is adjusted for type of hospital, whether the hospital is affiliated with a medical school, bed size, and type of location within the hospital; NHSN uses a negative binomial regression model to perform the calculation for CAUTIs (CDC, 2022). A higher SIR reflects greater numbers of CAUTIs above what would be expected for a hospital with those characteristics.

The exposure of interest is patient perception of timeliness of care. This measure is reported as a composite of two survey questions: “During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?” and “How often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted?” (CMS, 2023). It is quantified as the percentage of patients reporting that they sometimes or never received help as soon as they wanted, as included in the Patient survey (HCAHPS) – Hospital dataset (CMS, 2023). The variables for hospital state, ownership, and overall rating as found in the Hospital General Information dataset will be included for analysis as covariates. Hospital state, as divided by US Census regions, may act as a confounder based on geographical differences in healthcare or patient expectations. Hospitals may be owned by the federal, state, or local government; physician(s), private non-profits, and others. Hospital rating is assigned by CMS on a scale of 1-5, based on five measures including mortality, safety of care, readmission, patient experience, and timely and effective care (CMS, n.d.). These variables may also serve as confounders if quality varies generally in each group. Relationships will be examined using multivariate linear regression in SAS 9.4. University of South Florida IRB determined that this study is exempt from human subject review.

Results

Hospital demographics were calculated, summarized in Table 1. Of 2,219 hospitals, 51% were private voluntary non-profit hospitals. Approximately 40% were in the South region of the United States. Approximately 29% had an overall hospital rating of 3 out of 5. On hospital average, 13.7% of hospital patients surveyed reported that they sometimes or never received help as soon as they wanted it. The median CAUTI SIR was 0.713 of the expected number of CAUTIs; the interquartile range was 0.793. The maximum SIR was 9.6, or 9.6 times the expected number. The median percentage of patients reporting that they sometimes or never received help as soon as they wanted it was 13.0, the interquartile range was 6.0, and the maximum was 59.0.

The demographics of the hospitals excluded for CAUTI SIR are included in Table 2. The mean percentage of patients reporting that they sometimes or never received help as soon as they wanted it among the excluded hospitals was 7.42. The difference of means compared to the included hospitals, for which the mean value was 13.68, was statistically significant with p-value < 0.001. Among the excluded hospitals, 36.62% were owned by a private non-profit compared to 51.24% of included hospitals. Of the excluded hospitals, 34.26% of hospitals were located in the Midwest compared to 22.49% of included hospitals. The differences between the distributions of region and hospital ownership between the included hospitals and those excluded for a missing CAUTI SIR were both statistically significant, with p-value < 0.001.

Using linear regression, timeliness, geographic region, hospital ownership, and hospital rating were examined (Table 3). Hospital ownership and rating were not found to be significant factors for infection, ($F = 1.41$, $p = 0.1880$) and ($F = 0.29$, $p = 0.5916$) respectively. The four regions as a group were significant predictors ($F = 4.60$ and $p = 0.0033$). Timeliness was also a significant factor with coefficient of -0.0099 (95% CI: -0.014, -0.0059). The model was rerun including only the latter two variables (Table 4). There was a statistically significant relationship between perception of timeliness of care and SIR with a coefficient of -0.0104 (95% CI: -0.014, -0.007). This was a negative association, with increasing hospital percentage of patients who felt they sometimes or never received care as soon as they wanted being associated with decreasing, or improved, hospital SIR. Including region variables in the model did not demonstrate confounding compared to the model including only patient perception of timeliness of care, with timeliness of care coefficient estimates of -0.0104 and -0.011 respectively. The final model's R-squared was 0.01 demonstrating little predictive ability for hospital SIR.

Discussion

Contrary to the hypothesis, a higher hospital percentage of patients reporting they sometimes or never got help as soon as they wanted it was associated with a lower, and thus better, hospital SIR.

However, it was a very weak predictor. The coefficient for the timeliness variable, -0.01, indicates that for each one percent increase of patients reporting they sometimes or never got help as soon as they wanted, the SIR only decreased by 0.01. There is a very limited impact across the population of hospitals. This result shows a different effect from the similar 2013 study by Saman et al., which found a significant positive association between patient perception of timeliness of care and central line-associated blood stream infections.

There are several reasons that may lead to increased perceived wait times being associated with fewer CAUTIs. Potentially the perceived slower response time may be due to staff spending more time with each patient, leading to more careful decision-making about removing urinary catheters. It is also possible that patients had higher expectations for busier and better hospitals, leading them to perceive slower care times in response. The COVID-19 pandemic may have also changed patient expectations, leading them again to perceive slower response times. Of course, regardless of these results, timely care remains a crucial factor for patient wellbeing and positive outcomes and remains an important indicator of healthcare quality (AHQR, 2022; Saman et al., 2013).

The study was subject to several limitations. The major limitation is that over half of the original population of hospitals was excluded from the study for missing the CAUTI SIR variable. As shown in Table 2, the demographics of the hospitals excluded for this reason were significantly different from those of the included hospitals. A higher percentage of hospitals in the Midwest and of those owned by a governmental entity (federal, hospital district or authority, local, or state) were excluded. Non-profit hospitals were overrepresented in the included hospitals. Concerningly, the mean percentage of patients reporting that they sometimes or never received help as soon as they wanted it among the included hospitals was almost twice as much as in those excluded. Given the number of excluded hospitals and the differences in their characteristics, there is a large chance of bias in the final analysis. Additionally, as all variables were measured on a hospital level, the study faced an ecological fallacy. It was not possible to analyze or adjust for individuals' variables. For this same reason, it is possible that the weak effect is actually due to residual confounding bias or other bias not considered. More complete data collection in the future or data collection at the patient level may lead to stronger analysis. This study also had several strengths. There was a large sample size of hospitals. Additionally, studying this association at the hospital level accounts for higher levels of influence according to the socioecological model.

Additional research on this topic is warranted to determine whether patient perception of care, especially care related to catheters, may be a useful predictive factor for urinary infections or other HAI rates. A stronger understanding of this potential relationship could lead to a valuable new source of information for infection preventionists. Future studies would benefit from individual level data and may wish to analyze other aspects of patient perception of care or different HAIs.

Conclusion

This study ultimately did not support the hypothesis and did not illuminate any strong relationship between patient perception of care and CAUTI rates. However, it does contribute to the sparse literature surrounding this topic. Despite a weak negative result, timeliness of care remains important for patient care for other major health issues. While a new source of information for infection preventionists was not found through this study, duration of catheter use remains the main risk factor for CAUTIs and is fortunately easily tracked.

References

Agency for Healthcare Quality and Research. (2022, December). Six domains of healthcare quality. https://www.ahrq.gov/talkingquality/measures/six-domains.html#_ftn1

Backman, C., Wooller, K. R., Hasimja-Saraqini, D., Demery Varin, M., Crick, M., Cho-Young, D., Freeman, L., Delaney, L., & Squires, J. E. (2022). Intervention to reduce unnecessary urinary catheter use in a large academic health science centre: A one-group, pretest, posttest study with a theory-based process evaluation. Nursing Open, 9(2), 1432–1444. https://doi.org/10.1002/nop2.920

Burnett, E., Lee, K., Rushmer, R., Ellis, M., Noble, M., & Davey, P. (2010). Healthcare-associated infection and the patient experience: a qualitative study using patient interviews. The Journal of Hospital Infection, 74(1), 42–47. https://doi.org/10.1016/j.jhin.2009.07.027

Centers for Disease Control and Prevention. (2015, October 16). Catheter-associated urinary tract infections (CAUTI). https://www.cdc.gov/hai/ca_uti/uti.html

Centers for Disease Control and Prevention. (2019, November 13). Clostridioides difficile infection. https://www.cdc.gov/hai/organisms/cdiff/cdiff_infect.html

Centers for Disease Control and Prevention. (2022, April). The NHSN Standardized Infection Ratio (SIR): A guide to the SIR. https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf

Centers for Medicare & Medicaid Services. (n.d.) Overall star rating for hospitals. https://www.medicare.gov/care-compare/resources/hospital/overall-star-rating

Centers for Medicare & Medicaid Services. (2012) Conditions of participation: Nursing services. 42 CFR 482.23. https://www.ecfr.gov/current/title-42/chapter-IV/subchapter-G/part-482/subpart-C/section-482.23

Centers for Medicare & Medicaid Services. (2023, January). Hospital downloadable database data dictionary. https://data.cms.gov/provider-data/sites/default/files/data_dictionaries/hospital/HOSPITAL_Data_Dictionary.pdf

Green, D., Wigglesworth, N., Keegan, T., & Wilcox, M. H. (2006). Does hospital cleanliness correlate with methicillin-resistant Staphylococcus aureus bacteraemia rates? The Journal of Hospital Infection, 64(2), 184–186. https://doi.org/10.1016/j.jhin.2006.06.012

Haque, M., Sartelli, M., McKimm, J., & Abu Bakar, M. (2018). Health care-associated infections - an overview. Infection and Drug Resistance, 11, 2321–2333. https://doi.org/10.2147/IDR.S177247

Isaac, T., Zaslavsky, A. M., Cleary, P. D., & Landon, B. E. (2010). The relationship between patients' perception of care and measures of hospital quality and safety. Health Services Research, 45(4), 1024–1040. https://doi.org/10.1111/j.1475-6773.2010.01122.x

Kvist, T., Voutilainen, A., Mäntynen, R., & Vehviläinen-Julkunen, K. (2014). The relationship between patients' perceptions of care quality and three factors: nursing staff job satisfaction, organizational characteristics and patient age. BMC Health Services Research, 14, 466. https://doi.org/10.1186/1472-6963-14-466

Meddings, J., Rogers, M. A., Krein, S. L., Fakih, M. G., Olmsted, R. N., & Saint, S. (2014). Reducing unnecessary urinary catheter use and other strategies to prevent catheter-associated urinary tract infection: an integrative review. BMJ Quality & Safety, 23(4), 277–289. https://doi.org/10.1136/bmjqs-2012-001774

Newton, J. T., Constable, D., & Senior, V. (2001). Patients' perceptions of methicillin-resistant Staphylococcus aureus and source isolation: a qualitative analysis of source-isolated patients. The Journal of Hospital Infection, 48(4), 275–280. https://doi.org/10.1053/jhin.2001.1019

Nicolle L. E. (2014). Catheter associated urinary tract infections. Antimicrobial Resistance and Infection Control, 3, 23. https://doi.org/10.1186/2047-2994-3-23

Salge, T. O., Vera, A., Antons, D., & Cimiotti, J. P. (2017). Fighting MRSA infections in hospital care: How organizational factors matter. Health Services Research, 52(3), 959–983. https://doi.org/10.1111/1475-6773.12521

Saman, D. M., Kavanagh, K. T., Johnson, B., & Lutfiyya, M. N. (2013). Can inpatient hospital experiences predict central line-associated bloodstream infections? PloS One, 8(4), e61097. https://doi.org/10.1371/journal.pone.0061097

Stein, S. M., Day, M., Karia, R., Hutzler, L., & Bosco, J. A., 3rd (2015). Patients' perceptions of care are associated with quality of hospital care: a survey of 4605 hospitals. American Journal of Medical Quality, 30(4), 382–388. https://doi.org/10.1177/1062860614530773

Appendix

Table 1

Hospital Demographics of Study Sample

Variable		CAUTI SIR Better than the National Average	CAUTI SIR Same as the National Average	CAUTI SIR Worse than the National Average	All Hospitals
Total Number of Hospitals	N (%)[1]	390 (17.58%)	1683 (75.84%)	146 (6.58%)	2219 (100%)
Region[2]	Midwest[3]	94 (18.84)	372 (74.55)	33 (6.61)	499 (22.49)
	Northeast[4]	64 (16.98)	278 (73.74)	35 (9.28)	377 (16.99)
	South[5]	163 (18.38)	682 (76.89)	42 (4.74)	887 (39.97)
	West[6]	69 (15.13)	351 (76.97)	36 (7.89)	456 (20.55)
Hospital Ownership	Federal Government	1 (14.29)	6 (85.71)	0 (0)	7 (0.32)
	Hospital District or Authority Government	21 (15.0)	109 (77.86)	10 (7.14)	140 (6.31)
	Local Government	12 (12.12)	72 (72.73)	15 (15.15)	99 (4.46)
	State Government	9 (27.27)	22 (66.67)	2 (6.06)	33 (1.49)
	Physician	4 (40.0)	6 (60.0)	0 (0)	10 (0.45)
	Proprietary	62 (14.94)	340 (81.93)	13 (3.13)	415 (18.70)
	Voluntary Non-Profit, Church	38 (20.11)	135 (71.43)	16 (8.47)	189 (8.52)
	Voluntary Non-Profit, Private	215 (18.91)	852 (74.93)	70 (6.16)	1137 (51.24)
	Voluntary Non-Profit, Other	28 (14.81)	141 (74.6)	20 (10.58)	189 (8.52)
Hospital Overall Rating	1	36 (22.5)	111 (69.38)	13 (8.13)	160 (7.21)
	2	89 (16.95)	400 (76.19)	36 (6.86)	525 (23.66)
	3	119 (18.36)	492 (75.93)	37 (5.71)	648 (29.20)

4	103 (16.80)	469 (76.51)	41 (6.69)	613 (27.63)
5	43 (15.75)	211 (77.29)	19 (6.96)	273 (12.30)

[1] Percentage values for hospitals grouped by CAUTI SIR reflect row percent; percentage values for total hospitals reflect column percent
[2] US Census Regions
[3] Includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
[4] Includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont
[5] Includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia
[6] Includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

Table 2

Included versus Hospitals Excluded for Missing CAUTI SIR

Variable		Hospitals Included	Excluded for Missing CAUTI SIR	P-Value
Total Number of Hospitals	N (%)	2219 (100%)	2955 (100%)	
Region[2]	Midwest	499 (22.49)	1011 (34.26)	<0.001
	Northeast	377 (16.99)	276 (9.35)	
	South	887 (39.97)	1100 (37.28)	
	West	456 (20.55)	564 (19.11)	
Hospital Ownership	Federal Government	7 (0.32)	37 (1.25)	<0.001
	Hospital District or Authority Government	140 (6.31)	376 (12.72)	
	Local Government	99 (4.46)	322 (10.9)	
	State Government	33 (1.49)	164 (5.55)	
	Physician	10 (0.45)	65 (2.2)	
	Proprietary	415 (18.70)	618 (20.91)	
	Voluntary Non-Profit, Church	189 (8.52)	103 (3.49)	

	Voluntary Non-Profit, Private	1137 (51.24)	1082 (36.62)	
	Voluntary Non-Profit, Other	189 (8.52)	178 (6.02)	
	Tribal	0 (0)	10 (0.34)	
Timeliness	Mean (Standard Deviation)	13.68 (5.07)	7.42 (5.00)	<0.001

Table 3

Linear Regression ANOVA

Model	Source	Degrees Freedom	Sum of Squares	Mean Square	F Value	P-value
All variables included[1]	Model	13	24.61	1.89	2.70	0.0009
	Error	2205	1545.66	0.70		
	Corrected Total	2218	1570.27			
Timeliness and region included	Model	4	16.51	4.13	5.88	0.0001
	Error	2214	1553.76	0.70		
	Corrected Total	2218	1570.27			

[1] Includes timeliness of care variable, region, hospital ownership, and rating.

Table 4

Final Model Parameter Estimates

Parameter	Estimate	Standard Error	T-value	P-value
Intercept	1.123	0.067	16.81	< 0.0001
Timeliness	-0.010	0.0036	-2.90	0.004
Region, Midwest	-0.090	0.0578	-1.57	0.117
Region, South	-0.167	0.0515	-3.25	0.001
Region, West	-0.035	0.0584	-0.60	0.550