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Healthcare IT in Skilled Nursing and Post-Acute Care Facilities: Reducing Hospital Admissions and Re-Admissions, Improving Reimbursement and Improving Clinical Operations

by

Scott L. Hopes

A dissertation submitted in partial fulfillment
Of the requirements for the degree of
Doctor of Business Administration
Muma College of Business
University of South Florida

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DEDICATION

I dedicate this dissertation to my wife Ronda and our three children, Aaron, Ariel and Zakary. To my wife Ronda, who sacrificed so much and endured years of much time alone while Aaron, Ariel, Zakary and I were in college simultaneously. During this time, Aaron finished his master's degree at the University of Chicago, completed a fellowship with the American Institute of Indian Studies in Lucknow and Jaipur, India, and is now in the second year of his Ph.D. studies at Stanford University, Ariel completed her psychology degree at Brandies University and Zakary attended Florida International University, graduated from Miami Dade College and is now studying at University of South Florida St. Petersburg. To my children: the pathway to success is hard work and a continuous drive to obtain and retain knowledge and experience. Share what you learn with others and remember, it is the journey through life that is important and your success will come easier if the people around you want you to be successful! Ronda's support and sacrifices allowed all of us to pursue our educational goals, and I am eternally grateful for her partnership, nurture, love and support.

Acknowledgements and Dedications reflect the views of the author and are not endorsed by committee members or the University of South Florida.

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Table of Contents

Introduction……..1

Review of Literature…… 5

Methods……..11
Research Questions…….12
Hypotheses……..13
Data…….13
Research Design……..18
Assumptions……20
Results……22
Introduction……22
Descriptive Statistic…… 22
Multivariate Analysis……..22
Operational Performance…… 24
Employee Engagement……26
Staff Retention Rate……27
Total Staff Turnover……... 28
CMS Five Star Total Score……32
CMS Five Star Quality Measure……32
Complaint Tags…….. 32
Facility Deficiency Index……33
Failed Survey Revisits…… 34
Return to hospital (readmissions)……... 34
Financial Performance…… 35
Staff overtime…….. 36
Bad Debt…….. 37
Revenue performance against budget……37
Hypotheses Testing Results Summary……37

Conclusion…….. 40

References……..44

Appendices…….46
Appendix1
Long Term Care Minimum Data Set 3.0……. 47
Appendix 2
Design for Nursing Home Compare Five-Star Quality Rating System……..100
Appendix 3
Pairwise Comparisons…….151
Appendix 4
SPSS Reports……..154
Appendix 5
Data Table- Variables and Labels……..409

List of Tables

Table 1: Means, Adjusted Means, Standard Deviations and Standard 24

Table 2: Adjusted Means 25

Table 3: Pairwise Comparisons 26

Table 4: Clinical Performance Indicators: Adjusted Means 30

Table 5: Clinical Performance Indicators: Pairwise Comparisons 31

Table 6: Financial Performance Indicators: Adjusted Means 35

Table 7: Financial Performance Indicators: Pairwise Comparisons 36

List of Figures

Figure 1: Data Matrix....17

Figure 2: Employment Engagement Score....27

Figure 3: Staff Retention Rate by HIT Group....28

Figure 4: Staff Turnover Rate by HIT Group....29

Figure 5: CMS Five Star Total Score by HIT Group....32

Figure 6: CMS Five Star Quality Score by HIT Group....32

Figure 7: Complaint Tags Score....32

Figure 8: Return to Hospital Rates by HIT Group....33

Figure 9: Staff Overtime....37

Figure 10: Contributors to Hospital Readmissions....43

ABSTRACT

Health information technology (HIT), which includes electronic health record (EHR) systems and clinical data analytics, has become a major component of all health care delivery and care management. The adoption of HIT by physicians, hospitals, post-acute care organizations, pharmacies and other health care providers has been accepted as a necessary (and recently, a government required) step toward improved quality, care coordination and reduced costs: “Better coordination of care provides a path to improving communication, improving quality of care, and reducing unnecessary emergency room use and hospital readmissions. LTPAC providers play a critical role in achieving these goals” (HealthIT.gov, 2013).

Though some of the impacts of evolving HIT and EHRs have been studied in acute care hospitals and physician office settings, a dearth of information exists about the deployment and effectiveness of HIT and EHRs in long-term and post-acute care facilities, places where they are becoming more essential. This dissertation examines how and to what extent health information technology and electronic health record implementation and use affects certain measurable outcomes in long term and post-acute care facilities. Monthly data were obtained for the period beginning January 1, 2016 through June 30, 2017, a total of 18 months. The level of EHR adoption was found to positively impact hospital readmission rates, employee engagement, complaint deficiencies, failed revisit surveys, staff overtime (partial EHR), staff turnover rate (full EHR) and United States Centers for Medicare and Medicaid Services (CMS) Five Star Quality score. The level of EHR adoption was found to negatively impact CMS Five Star Total

score, staff retention rate (full EHR) and staff overtime (full EHR group higher than partial EHR).

Chapter I:

Introduction

How and to what extent do health information technology and electronic health record implementation and use affect the rapidly growing long term and post-acute care sector of the U.S. health care economy? This is a resource sensitive business management, clinical quality, health care policy question that includes significant compliance and litigation concerns.

America's fast-paced, high-cost, high-tech, litigation ridden health care environment has been transformed into multiple transitional systems and locations where patients receive care. These locations include the physician office, ambulatory surgery facility, independent diagnostic center, pharmacy, in-patient acute care hospital (including specialty hospitals), post-acute facilities (long-term and rehabilitation) and the home. By 2013, at least 42% of Medicare inpatient stays were discharged to post-acute care facilities, also known as PACs (Tian, 2016), and that percentage will continue to grow.

Improved clinical treatments, technologies and cost factors have resulted in the physical movement of patients often among, between and across care locations, particularly from acute care hospitals to post-acute and long-term facilities (LTPACs). As patients transition from one care setting to another, a lack of coordination, communication and timely, valid clinical information can lead to adverse clinical outcomes and events. Access to and use of clinical and related information are the venues of health information technology (HIT), and electronic health records (EHRs) are the key, operational component for health care providers.

Health information technology (HIT), which includes electronic health record (EHR) systems and clinical data analytics, has become a major component of all health care delivery

and care management. The adoption of HIT by physicians, hospitals, post-acute care organizations, pharmacies and other health care providers has been accepted as a necessary (and recently, a government required) step toward improved quality, care coordination and reduced costs. “Better coordination of care provides a path to improving communication, improving quality of care, and reducing unnecessary emergency room use and hospital readmissions. LTPAC providers play a critical role in achieving these goals” (HealthIT.gov, 2013). Though some of the impacts of evolving HIT and EHRs have been studied in acute care hospitals and physician office settings, there is a dearth of information about the deployment and effectiveness of HIT and EHRs in long-term and post-acute care facilities where they are becoming more essential.

LTPACs are distinct from acute care hospitals in several ways: (1) the work environment is less complex, less urgent and more routinized than hospital-based clinical care; (2) patient populations tend to be more elderly and in fragile health; (3) patients require assisted daily living activities (e.g., showering, dining, dressing); and (4) LTPACs have become more clinically and technologically complex as acute care hospitals discharge patients earlier, essentially redefining clinical and operational roles of post-acute care. In some government and consulting sectors, HIT is touted as being a silver bullet to improve management, costs and clinical outcomes. HITs are increasingly more import for LTPACs with the increased need and demand for sharing patient health information (PHI) across provider sectors as the patient transitions from one care setting to the next. This connectivity and PHI sharing is essential to achieving a coordinated, patient centric and cost effective health delivery system.

The impact of HIT and EHRs differs within and between hospitals and physician’s offices; LTPACs are substantively different from both of those settings.

Hospital readmissions have become one of the primary problems facing the healthcare industry and the Medicare program. The Affordable Care Act added a section to the Social Security Act establishing the Hospital Readmissions Reduction Program, which requires the U.S. Centers for Medicare and Medicaid Services (CMS) to reduce payments to hospitals with excess readmissions, effective for discharges beginning on October 1, 2012. (McIlvennan, Eapen, & Allen, 2015; Rice, 2015) The financial impact for hospitals in 2015 was a maximum penalty ratio of 0.97 or a three percent (3%) reduction of total Medicare payments. In 2015, Medicare fined 2,610 hospitals for readmission penalties for an estimated total of more than $428 million in 2015. (Rau, 2014) LTPAC facilities are both a source of hospital readmissions and can serve as an alternative to hospital readmissions.

No clear consensus exists as to how many readmissions may be preventable. Studies suggest that the rate of avoidable or preventable readmissions may be anywhere from 5 percent to 79 percent. ("Health Policy Brief: Medicare Hospital Readmissions Reduction Program," 2013) An analysis of 2005 Medicare claims data by the Medicare Payment Advisory Commission (MedPAC) concluded that about three-quarters of readmissions within 30 days were potentially preventable, representing an estimated $12 billion in Medicare spending. ("Health Policy Brief: Medicare Hospital Readmissions Reduction Program," 2013)

Monthly data were obtained for the period beginning the month of January 2016 through the month ending 30 June 2017, a total of eighteen months. During the data acquisition period, facilities across the company were at various stages of electronic health record implementation, and based on a facility's level of adoption, they were individually coded as follows:

0. Paper Activity of Daily Living (pADL) & Health Records (pHR)
1. Electronic ADL (eADL) & Paper Health Records (pHR)

2. eADL & eHR.

Data were initially obtained from 188 facilities. Following elimination of facilities with incomplete data, 168 facilities served as the basis for this study. The data set reflects 18 months of information and contains 3,024 monthly records. The 168 study facilities operate a total of 18,343 beds. The smallest facility in the study had 30 SNF beds and the largest had 240 beds with a median facility bed count of 120. More than 329,000 patient bed days of data are included in the study.

This dissertation examines how and to what extent health information technology and electronic health record implementation and use affects certain measurable outcomes in long term and post-acute care facilities. The study presents results from analysis of the effects of HIT in LTPAC facilities in three, select and delimited domains: clinical, financial and operational. Following this Introduction, Chapter 2 reviews provides a review of both topical and methodological literature; Chapter 3 describes the research design and methods used in the stud; Chapter 4 presents the results of the analysis; and Chapter 5 offers findings and conclusions.

Chapter II:

Review of Literature

Evidence based medicine is a term that has become part of everyday nomenclature in healthcare today. Sackett et al. define it as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients" (1996). However, this definition hardly provides guidance or clarity on how to actually accomplish the application of "current best evidence" in today's clinical delivery system. Accordingly, "Incorporating evidence-based information into patient care requires making the right information available at the right time" (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). In order to collect this evidence, the federal 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act was instituted; it has resulted in an evolution in the United States healthcare delivery system for implementation of electronic health record system in hospitals and physician's offices. To overcome financial barriers, the HITECH Act incentive program provides $19.2 billion to qualified hospitals and physicians (Wang, Wang, & Biedermann, 2013).

There is increasing cognizance among providers and policy makers that the geriatric population commonly experience several acute or post-acute transitions in care during the course of a single episode; these care transitions may be susceptible to breakdowns in communications between disparate providers, resulting in deficiencies in patient care. Therefore, expanding HITECH Act incentives to the long term and post-acute provider sector is worth further study.

Eleven ADLs are listed on the Long Term Care Minimum Data Set or MDS (Appendix 1). They are bed mobility, transfers, walk in room, walk in corridor, locomotion on unit, locomotion off unit, dressing, eating, toilet use, personal hygiene and bathing. Four of these activities are considered "late loss ADLs," meaning people retain their functional ability in these four areas the longest. The four late loss ADLs are bed mobility, transfers, eating and toilet use. A resident may lose the ability to dress himself or walk, but may still possess the ability to turn in bed, get out of a chair, feed himself and/or assist with using the toilet (Newell, 2012). The level of assistance required or impairment, for activities of daily living (ADLs), or basic personal care activities, has been shown to be associated with acute hospitalizations (Kruse et al., 2013).

ADL coding directly impacts the formal U.S. government Quality Measurements that are part of the Centers for Medicare and Medicaid (CMS) Five Star program. This empirical rating program ostensibly distinguishes relative quality performance and, more importantly, what reimbursement level the facility receives for care provided. The four late loss ADLs are heavily weighted and have an important role with the 5-Star Quality Measure scoring and the CMS Resource Utilization Groups (RUG) level used for Medicare and Case Mix payments.

The Quality Measurements (QM) are dynamic and fluid and can change a facility's 5-Star ranking during the year, compared to staffing and survey "star" rankings that are unlikely to change during the year. An unfavorable long term post-acute care (LTPAC) facility survey can take years to overcome as well as years to improve the survey star ranking. Yet, a high QM score can raise the overall star level of a LTPAC facility and is based on more current information. In addition to ADL scores, reimbursement also is driven by RUG levels. A number of RUG levels requires a particular ADL Index score to qualify for a particular RUG grouping. A patient

requiring minimal assistance may not group into the higher level despite having the appropriate clinical condition. For example, a resident may have received IV fluids for hydration, which is a qualifier for Special Care. The minimum ADL Index score to qualify for Special Care is a 2.(Newell, 2012)

Patients requiring limited assistance are reimbursed at a lower level than those who require more nursing help. The basic urban rate for the Special Care RUG HB1 is $332.42 per day and the custodial level PA1 is $184.64 per day, a difference of $147.78 per day.(Newell, 2012) If the ADL coding is underscored, it results in a significant reduction in potential reimbursement (Newell, 2012).

Given the evolving healthcare paradigm to one of value-based care, with ensuing incentives and penalties, timely analysis of current hospital transfer trends is undertaken to identify potential strategies to effectively reduce the preventable 30-day hospital readmission rate. Post-acute care (PAC) is care provided to a resident after an acute care hospitalization; it requires a provision of skilled level services for a defined period of time with anticipation of return to the home (Hovey, Kim, and Dyck (2015). As defined by the Centers for Medicare & Medicaid (CMS), PAC encompasses continued medical care and rehabilitation services following an inpatient acute hospital stay (2014). These services may be provided in long-term care hospitals (LTCHs), inpatient rehabilitation facilities (IRFs), skilled nursing facilities (SNFs) and home health agencies (HHAs).

A readmission is clinically related to a prior admission and potentially preventable if a reasonable expectation exists that it could have been prevented by improved quality care in the initial hospitalization, adequate discharge planning with post discharge follow up or improved coordination of care between inpatient and outpatient healthcare teams (Goldfield et al., 2008).

Hospital readmission rates have been proposed as an important indicator of quality of care. A number of studies use rigorous multivariate methods to test factors associated with variation in the rate of occurrence of preventable admissions (Friedman & Basu, 2004).

A 2012 survey of the American College of Physicians (ACP) national sample of internists found that family practice physicians reported an electronic medical record (EMR) associated loss of 48 minutes of free time per clinic day.(McDonald et al., 2014) In a follow up survey of 411 respondents, 89.8% reported that at least one data management function was slower after EMRs were adopted, and 63.9% reported that note writing took longer. A third (34%) reported that it took longer to find and review medical record data, and 32% reported that it was slower to read other clinicians' notes. Of the 59.4% of respondents who lost time, the mean loss was −78 minutes per clinic day, or 6.5 hours per 5-day clinic week. In summary, "the loss of free time that our respondents reported was large and pervasive and could decrease access or increase costs of care. Policy makers should consider these time costs in future EMR mandates" (McDonald et al., 2014).

Implementation of HIT in LTPAC facilities are expected to positively affect staffing at all levels from Certified Nurses Assistants (CNAs) to Registered Nurses (RNs). But, improvements in staff productivity depend on avoiding the productivity paradox. The results of a case study that examined the varied nature of cognitive, emotional and behavioral reactions elicited by physicians in response to the introduction of a computerized physician order entry system in a hospital setting demonstrated the challenges of evading a productivity paradox in the healthcare environment. Bhattacherjee and his colleagues identified the three significant findings below (2013):

1. Managers should understand that IT implementation is a complex process of coordinating organizational change. “Technologically sophisticated systems with clear organizational benefits may still be resisted by users if they conflict with the object of their activity, community, professional rules, and roles. Managerial efforts should be directed towards mitigating the adverse effects of IT on these inalienable dimensions of professional work” (Bhattacherjee, 2013).

2. Acceptors and resistors can coexist within the same user population, and hence it is unwise to ignore resistors and just focus on acceptors during IT implementation. Managing user resistance in organizations requires identifying potential resistors, understanding the reasons for their resistance, and taking steps to ameliorate the conditions driving their resistance. Strategies directed at IT acceptors are rarely successful at overcoming IT resistance in organizations. (Bhattacherjee, 2013).

3. Managers should recognize that “sometimes resistance can help identify unanticipated system or organizational problems…An appreciation of these problems, coupled with well-intentioned efforts to ameliorate them, may go a long way in alleviating IT resistance in organizations” (Bhattacherjee, 2013).

Some studies suggest that the use of HIT may augment health costs by increasing time spent charting (Mador & Shaw, 2009). A dissertation by Frederic Miribel analyzing the role of information technology in the economy of the United States through its effects on regional labor productivity from 1977 to 1997, a period prior to HITECH and EHR Incentives, clearly describes and could have predicted the effects realized: “The regional approach permits me to shed some light on the so-called ‘productivity paradox,’ the oft-cited finding that investment in information technology appeared to have had no visible effect on aggregate productivity.” In general, Miribel found that information technology is a productive input that may have exhibited excess returns contributing to “average yearly growth.”(Miribel, 2001) While a productivity paradox was experienced among the users of technology, the sector supplying the technology, information technology employment, was estimated to have increased overall productivity across the counties and states by 5% to 10% (Miribel, 2001).

Assuming the presence of a productivity paradox in healthcare related to the implementation of electronic medical record (EMR) technology and a high cost in terms of capital investment and operating cost, it is imperative to gain a return on investment. The expectation has been that, in general, access to clinical information results in improved clinical outcomes and management of costs. Researchers at the University of Texas in Dallas developed automated model harnessing EMR data for identifying resuscitation events and death (RED). REDs lead to substantial increases in medical costs and death. The automated model predicted RED 15.9 hours before they occurred. The authors concluded “an automated model harnessing EMR data offers great potential for identifying RED and was superior to both a prior risk model and the human judgment-driven RRT” (Alvarez et al., 2013).

Investments in HIT are increasingly higher in LTPAC facilities than ever before. The rapid implementation of EHR systems in the United States, fueled by federal policy and economic incentives, has stressed an already overburdened healthcare delivery system resulting in the creation of an American healthcare productivity paradox. The observance and recognition of the productivity paradox has been known for decades. In a 1993 paper, Erik Brynjolfsson noted, “Productivity is the fundamental economic measure of a technology's contribution.” With this understanding, CEOs and line managers have increasingly begun to question their large investments in computers and related technologies” (Brynjolfsson, 1993).

This dissertation research examined the effects of HIT implementation at various stages across a large number of LTPACs under one company’s management and control.

Chapter III:

Research Method

Concepts and Measures

This study examined the impact of use of health information technology (HIT) and the adoption of electronic health record (EHR) on clinical, operational and financial outcomes in long term and post-acute care facilities. Data was obtained for 188 long term post-acute care (LTPAC) facilities with a total of 168 facilities providing complete data for an 18 month period, from January 1, 2016 to June 30, 2017, totaling 3,024 monthly records. The facilities comprised a total of 18,343 beds, the smallest facility had 30 skilled nursing facility (SNF) beds while the largest had 240 beds with a median facility bed count of 120. More than 329,000 patient bed days of data were analyzed in this study.

The research goal of this study was to examine the impact of the adoption of specific levels of HIT in different facilities within a large, multi-state, long term, post-acute and rehabilitation provider organization (LTPAC). A retrospective quantitative analysis was employed to study the effects of HIT on key performance indicators in three distinct categories: clinical, operational and financial. This chapter describes the theory, hypotheses, research design and methodology employed in this study.

This research serves as a preliminary analysis of the effect of HIT, specifically EHR, on operational factors, clinical factors and financial factors in LTPACs.

Research Questions and Research Design

In this section, we first describe the overall research questions then develop the testable hypotheses to provide comprehensive answers to those research questions.

RQ1: What are the effects of HIT implementation of EHR on clinical, operational and financial outcomes?

The specific variables or outcomes of interest used in this study to measure the clinical, operational and financial outcomes are listed below.

1. Clinical variables or outcomes of interest:
    1.1. CMS Five Star (Total Score)
    1.2. CMS Five Star Quality Measure
    1.3. Failed survey re-visits
    1.4. Complaint Survey Citations (Complaint Tags %)
    1.5. Facility Deficiency Index
    1.6. Return to Hospital (hospital readmissions)
2. Operational variables or outcomes of interest
    2.1. Employee engagement (survey results)
    2.2. Staff Retention
    2.3. Staff Turnover
3. Financial variables or outcomes of interest
    3.1. Staff Overtime
    3.2. Bad Debt Expense
    3.3. Revenue Performance

RQ2: Does the level of adoption of EHR (full or ADL only) impact the clinical, operational and financial outcomes?

Hypotheses

Below, are the hypotheses constructed to address the research questions:

H1. The adoption of an electronic health record (EHR) module for activities of daily living (eADL) documentation impacts operational outcomes at LTPACs.

H2. The adoption of an eADL documentation impacts clinical outcomes at LTPACs.

H3. The adoption of an eADL documentation impacts financial performance at LTPACs.

H4. The adoption of a Full Clinical electronic health record (Full EHR) impacts operational outcomes at LTPACs.

H5. The use of a Full EHR documentation impacts clinical outcomes at LTPACs.

H6. The use of a Full EHR documentation impacts financial performance at LTPACs.

Data

Performance data were collected and aggregated by facility and month and provided by the company. Data from government and corporate sources were combined. Performance indicator data were categorized into the three distinct areas of interest below:

1. Operational
2. Clinical
3. Financial

The following data were obtained from the Long Term Care Minimum Data Set 3.0 submission for the Center for Medicaid and Medicare Services (CMS) (see Appendix 1) and reported by the company:

- Five Star (Total Score)
    - 5 Star Overall Score (Data from data.Medicare.gov.).

- Five Star Quality Measure
    - QM Five Star score from CMS nursing home compare database.
- Severity Tags (not used in analysis because of missing data)
    - Total Number of G, H, I, J, K and L Tags divided by the Total Number of Tags for Cycle 1 (Data from data.Medicare.gov).
- Failed survey re-visits
    - Reports the percentage of centers that failed revisits. Any center that has more than one revisit in Cycle 1 is considered to have a failed revisit (Data from Data.Medicare.Gov Provider dataset).
- Facility Deficiency Index
    - FDI is calculated by "Total of Facility Health Deficiencies" divided by State "Average of Health Deficiencies" (Data from Data.Medicare.Gov Deficiencies dataset).
- Complaints
    - Complaints filed.
- Complaint Survey Citations (Complaint Tags %)
    - Percentage of Complaint Survey Tags for last full quarter. Any complaints that did not result in a tag are not reflected in this percentage (Data from Data.Medicare.Gov Deficiencies dataset).
- Return to Hospital
    - Number of residents admitted from and discharged to an Acute Care Hospital within 30 days of admission divided by the number of residents admitted from an Acute Care Hospital (Minimum Data Set submission and health records).

The remaining variables or indicators were comprised of internal data or calculated from corporate-internal data.

- Employee engagement (survey results)
    - Annual employee engagement survey.
- Staff Retention
    - Number of staff with over one year of service on the last day of the most recent month divided by the average monthly staff count for the last 12 months.
- Staff Turnover
    - Total number of terminations for the previous 12 months divided by the average monthly staff count for the last 12 months as of the last date of the most recent month.
- Staff Overtime
    - Sum of overtime hours divided by the sum of total hours in the last 30 days. Data from PeopleNet Time Clock System and Payroll Edits.
- Bad Debt Expense
    - YTD (year to date) bad debt divided by YTD revenue.
- Revenue Performance
    - EBITDAR (earnings before income tax, depreciation, amortization and rent), which is total revenue minus management expenses and operating expenses. Calculated as percent over/under budget. Data from General Ledger.
- Budgeted Revenue
- Skilled patient mix (used as covariant)

- Number of MTD (month to date) Medicare and Managed Care residents divided by total census MTD, calculated daily based on midnight census.

Monthly data were obtained for the period beginning January 1, 2016 through June 30, 2017, a total of 18 months. During the data acquisition period, facilities across the company were at various stages of electronic health record implementation. Based on a facility's level of adoption, it was individually coded as follows:

0. Paper Activity of Daily Living (pADL) and paper Health Records (pHR)
1. Electronic ADL (eADL) and Paper Health Records (pHR)
2. eADL and eHR

Data were initially obtained from 188 facilities. Following elimination of facilities with incomplete data, 168 facilities served as the basis for this study. The data set reflects 18 months of information and contains 3,024 monthly records. The 168 study facilities operate a total of 18,343 beds. The smallest facility in the study had 30 SNF beds and the largest had 240 beds with a median facility bed count of 120. More than 329,000 patient bed days of data were included in the study.

HIT EHR status was coded through the IBM SPSS Transform Compute Variable process. A master key was provided designating the implementation date (Month-Year) and type of HIT EHR implementation, eADL or Full Clinical EHR. Default was set as 0 (none). Monthly records were coded for the EHR status for the month following the month of implementation. For example, if the month of implementation was June 2016, records for each month from July 2016 forward reflected the new EHR status.

Data from the facilities were in the format maintained for input into the company's reporting dashboard. These data were provided in Microsoft Excel workbook files for each

variable. The individual workbooks were combined using Microsoft Access' merge function. Data Matrix is provided in Figure1 below while the complete matrix for the Long Term Care Minimum Data Set is provided in Appendix 2 with links to the code tables and descriptions.

Data Variables	Input	Transparency	Category
Variable/ Performance Indicator		**Masked Y/N**	
Facility Name		Y	Facility
Facility Location		N	Facility
Facility Region		Y	Facility
Number of Beds		N	Facility
IT Go Live Date		N	Facility
IT TYPE	Full E.H.R, ADL, None	N	Facility
Month/Year		N	Facility
OT % 30	Sum of Overtime hours (30 days)/Sum of Total Hours (30 days)	N	Operational
Employee Engagement	% Employees Engaged	N	Operational
Employee Turnover	Sum of Terminations (12 months)/Sum of Total Staff (12 months) (excludes interims and PRNs)	N	Operational
Employee Retention	Number of staff with over one year of service on the last day of the month period divided by the average monthly staff count for the last 12 months (Excludes interims and PRNs)	N	Operational
Overall Quality Rating	Average Overall Rating, Quality Rating, Staffing Rating and Survey Rating	N	Clinical
Complaint Tags	Sum of Complaint Tags	N	Clinical
G+ Tags	Sum of G+ Tags / Sum of total Tags	N	Clinical
RTH %	Number of Residents Admitted from and Discharged to an Acute Care Hospital within 30 Days of admission divided by the Number of Residents Admitted from an Acute Care Hospital	N	Clinical
HDI	Number of Health Defficiencies/ State Health Deficiency Index Average	N	Clinical
ADC MTH	Sum of Census/ Number of Days in Current Month	N	Financial
Bad Debt YTD %	Sum of Bad Debt (YTD)/ Sum of Revenue (YTD)	N	Financial
EBITDAR YTD %	Sum of EBITDAR-Sum of EBITDAR Budget)/ Sum of EBITDAR Budget	N	Financial
Case Mix Index	Medicare Case Mix Index	N	Control
Average Pt Age		N	Control
Medicare Days %		N	Control
Medicaid Days %		N	Control
Commercial Days %		N	Control
Other Payer Days %		N	Control

Figure 1: Data Matrix

Following the merging of data files and cleaning the data, monthly data for 168 facilities comprised the final data, which was imported into SPSS to create the following data set in SPSS version 24.

Data were obtained for 188 facilities. Facilities with incomplete data were omitted from the study. A total of 168 facilities had complete data for 18 months, totaling 3,024 monthly records. The facilities comprise a total of 18,343 beds; the smallest facility had 30 SNF beds and the largest had 240 beds with a median facility bed count of 120.

Research Design

The data used in this study was observational; the best empirical strategy to analyze such data is a retrospective quantitative analysis to test the hypotheses and provide insights to answer the research questions.

The research design was a Natural Experiment where we assumed adoption of partial HIT (eADL) and full HIT (eADL+eEHR) as facility level treatment. We acknowledge that there may have been unobserved characteristics of the facilities that may have influenced their HIT adoption decisions and, to that extent, the treatment may not have been randomly assigned; therefore, our parameter estimates may be biased. We discuss the implications of these limitations in the results sections and provide a path for further empirical investigation in the conclusion section with potential for future research.

We used 168 of the Company's facilities divided into three groups for each month based on HIT EHR status: fifty-eight (58) (Group 1) facilities (which had implemented a partial EHR for ADLs) treatment group 1, forty (40) (Group 2) facilities (which had implemented the Full Clinical EHR system) as the treatment group 2 and seventy (70) (Group 0) facilities (which had not implemented an EHR system) as the control group; we compared outcomes between the

three groups of facilities. Facilities data were obtained for their operational outcomes (overtime hours, employee engagement, employee turnover, employee retention), clinical outcomes (overall five star quality rating, complaint tags, return to hospital percentage facility health deficiency index, failed survey revisits) and financial outcomes (average daily census, bad debt, percent overtime, revenue performance compared to budget, EBITDAR YTD percentage), after controlling for facilities' level differences in skilled patient mix (PAC).

Assumptions

Before presenting results, the key assumptions that informed the empirical strategy are outlined below:

1. Data provide information on Facility performance, across facilities and over time – both cross-sectional and time-series dimensions.
2. Data are balanced Panel Data and include 168 Facilities observed at monthly intervals from Jan2016-Jun2017.
3. Correlation (clustering) over time for a given Facility, with independence over other Facilities is assumed. This means the performance parameters for the same facility are correlated over time but independent across facilities.
4. Variation for the dependent variable and regressors has 2 components: between variation (variation between Facilities) and within variation (variation within Facilities).
5. Pooled model: Pooled model of Panel-Data Analysis, which specifies constant coefficients along with the usual assumptions for cross-sectional analysis, was considered.
6. Assumptions for Pooled Panel-Data Analysis: same as cross-sectional data analysis.

7. The variation of outcomes for facilities amongst themselves is assumed to be significantly greater than the variation within each one of them over the time period. This allowed us to view the data as a cross sectional sample of 168 X 18 sample points or observations that vary due to performance variation amongst the facilities during the time frame of study. This assumption allowed us to interpret the results, ignoring temporal impacts or impacts over-time. The justification of this assumption was based on the setting of these facilities wherein the clinical, operational and financial performance of each facility was rather constant overtime without any technological interventions.

For the purpose of this dissertation research, a preliminary analysis was conducted with the one-way multivariate analysis of covariance (one-way MANCOVA) performed utilizing SPSS 9.4. Further analysis with Panel Data methods is proposed for future research. Following the MANCOVA analysis, univariate one-way ANCOVAs and multiple pairwise comparisons were performed with SPSS to understand which individual outcomes were affected by the EHR implementation state. SPSS Split File procedure was performed and with Chart Builder procedure a scatterplot matrix was produced with added loess lines to visually determine Linearity.

Not all pairs of dependent variables were linearly related, but a majority were, as assessed by visual inspection of scatterplots. There was heterogeneity of regression slopes, as assessed by the interaction term between EHR and SkilledPctMix, $F(24, 6014) = 8.867$, $p < .001$. Residuals were not normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). The remaining assumptions are assumed to be met, and the MANCOVA analysis was continued to provide preliminary analysis to gain an understanding of the data. The large number of observations and

the robustness of the procedures were considered sufficient to account for the few assumption violations stated above.

Chapter IV:

Results

Introduction

This chapter presents the results of the data analysis and findings of the dissertation research. It begins with a summary of descriptive statistics of the LTPAC facilities' data submissions, followed by a detailed presentation of the multivariate data analysis and results organized by research question. It concludes with a brief summary of the results leading to the discussion of findings in Chapter V.

Descriptive Statistics

A total of 168 LTPAC facilities that provided 18 complete monthly records of data were used in the analysis. These facilities had a combined reported total of 329,476 bed days available for the study period with an average of 109 beds per facility; the minimum was 30 beds and maximum was 240 beds while the median bed size was 120 beds. The facilities included in this analysis comprised 18,343 total LTPAC beds.

For the reporting period ending June 30, 2017, 70 facilities had no HIT for health records or ADL, 58 facilities had HIT for ADL only and 40 facilities had full clinical eHRs.

Multivariate Analysis

A one-way MANCOVA was run to determine the effect of HIT on 12 measures used by the company for evaluating LTPAC facility performance:

1. **Operational Processes**
   1.1. Employee engagement

1.2. Staff retention rate

1.3. Staff turnover

2. Financial Performance

2.1. Staff overtime

2.2. Bad Debt

2.3. Revenue performance against budget

3. Clinical Performance

3.1. CMS Five Star Total Score

3.2. CMS Five Star Quality Measure

3.3. Complaint Tags percentage

3.4. Facility Deficiency Index

3.5. Failed Survey Re-Visits

3.6. Return to hospital/re-admissions

The one-way MANCOVA showed a statistically significant difference between the HIT EHR groups on the combined dependent variables after controlling for skilled percent mix, $F(24,6018) = 38.744$, $p < .0005$, Wilks' $\Lambda = .750$, partial $\eta 2 = .134$.

Follow up univariate one-way ANCOVAs were performed. A Bonferroni adjustment was made such that statistical significance was accepted when $p < .0167$. There were statistically significant differences in adjusted means for Employee Engagement $F(2, 3020) = 21.042$, $p < .001$, partial $\eta 2 = .014$), Staff Retention $F(2,3020) = 32.710$, $p < .001$, partial $\eta 2 = .021$), Staff Turnover $F(2, 3020) = 6.386$, $p < .001$, partial $\eta 2 = .004$), CMS 5 Star $F(2, 3020) = 23.651$, $p < .001$, partial $\eta 2 = .015$), CMS Five Star Quality $F(2, 3020) = 93.474$, $p < .001$, partial $\eta 2 = .058$), Failed Revisits $F(2, 3020) = 4.864$, $p < .001$, partial $\eta 2 = .003$), Complain Tags $F(2, 3020) = 53.616$, $p < .001$, partial $\eta 2 = .034$), Facility Deficiency Index $F(2, 3020) = 4.227$, $p < .001$, partial $\eta 2 = .003$), Return to Hospital $F(2, 3020) = 59.512$, $p < .001$, partial $\eta 2 = .038$), and Overtime $F(2, 3020) = 86.419$, $p < .001$, partial $\eta 2 = .054$). The differences in two variables

were not significant: Bad Debt F (2, 3020) = 1.551, p = .212, partial η2 = .001) and Revenue performance to Budget F (2, 3020) = .501, p =.606, partial η2 = .000). Statistically significant one-way ANCOVAs were followed up with pairwise comparisons with a Bonferroni adjustment.

Means and adjusted means for the Operation Processes Performance indicators varied only slightly as shown in Table 1. (*Adjusted Covariates appearing in the model are evaluated at the following values: % Skilled Patients = 19.6091%)*

Table 1: Means, Adjusted Means, Standard Deviations and Standard Errors for the Three Operational Processes Performance indicators for each HIT Group

	Employee Engagement		Staff Retention Rate		Staff Turnover	
HIT Group	*M (SD)*	M_{adj} *(SE)*	*M (SD)*	M_{adj} *(SE)*	*M (SD)*	M_{adj} *(SE)*
None	31.9%(11.4)	31.97%(.312)	60.0%(11.9)	60.1%(.003)	42%(10.9)	41.9%(.003)
eADL	34.6%(13.6)	34.7%(.391)	60.1%(11.1)	60.2%(.004)	41.5%(10.9)	41.4%(.003)
FulleHR	35.6%(12.4	35.3%(.586)	55.5%(12.4)	55.2%(.006)	39.5%(10.4)	39.8%(.005)

Operational Performance

Among the operational performance indicators, the Full Clinical EHR group was consistently significant while having a lower staff turnover rate of 39.8% compared to 41.9% and 41.4%; this group also experienced a lower staff retention rate, 55.2%, compared to 60.1% and 60.2%.

Table 2: Adjusted Means

ADJUSTED MEANS							
				Interval			
Operational Dependent Variable		Mean	Std. Error	Lower Bound	Upper Bound		
Emplyee Engagement Score	None	*31.965[a]	0.312	31.354	32.576		
	eADL	*34.660[a]	0.391	33.893	35.426		
	FulleHR	*35.296[a]	0.586	34.147	36.446		
Staff Retention Rate	None	.601[a]	0.003	0.595	0.607		
	eADL	.602[a]	0.004	0.595	0.610		
	FulleHR	*.552[a]	0.006	0.541	0.563		
Total Staff Turnover Rate	None	.419[a]	0.003	0.414	0.424		
	eADL	.414[a]	0.003	0.407	0.421		
	FulleHR	*.398[a]	0.005	0.388	0.408		
Note: a. Covariates appearing in the model are evaluated at the following values: % Skilled Patients = 19.6091%.							
** =statistically significant difference (p<.0167) based on Bonferroni adjustment,*							
95% confidence interval (CI) is simultaneos confidence interval based on Bonferroni adjustment							

Table 3: Pairwise Comparisons

Pairwise Comparisons							
						Interval for Difference[b]	
Operational Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
Emplyee Engagement Score	None	eADL	-2.694*	0.498	0.000	-3.888	-1.500
		FulleHR	-3.331*	0.670	0.000	-4.935	-1.727
	eADL	None	2.694*	0.498	0.000	1.500	3.888
		FulleHR	-0.637	0.712	1.000	-2.343	1.069
	FulleHR	None	3.331*	0.670	0.000	1.727	4.935
		eADL	0.637	0.712	1.000	-1.069	2.343
Staff Retention Rate	None	eADL	-0.001	0.005	1.000	-0.013	0.010
		FulleHR	.049*	0.006	0.000	0.034	0.064
	eADL	None	0.001	0.005	1.000	-0.010	0.013
		FulleHR	.050*	0.007	0.000	0.034	0.067
	FulleHR	None	-.049*	0.006	0.000	-0.064	-0.034
		eADL	-.050*	0.007	0.000	-0.067	-0.034
Total Staff Turnover %	None	eADL	0.005	0.004	0.809	-0.006	0.015
		FulleHR	.021*	0.006	0.001	0.007	0.035
	eADL	None	-0.005	0.004	0.809	-0.015	0.006
		FulleHR	.016*	0.006	0.029	0.001	0.031
	FulleHR	None	-.021*	0.006	0.001	-0.035	-0.007
		eADL	-.016*	0.006	0.029	-0.031	-0.001
Based on estimated marginal means							
*. The mean difference is significant at the .05 level.							
b. Adjustment for multiple comparisons: Bonferroni.							

Employee Engagement

The employee engagement score tended to be higher for facilities with some level of HIT, and staff turnover tended to be lower for the same groups. While there was a statistically significant difference in employee engagement between HIT groups none, eADL and FulleHR (31.97, 34.67, 35.30), Figure 1, any inference should be limited as only results from one employee survey were applied to all 18 months of data as provided; also, a number of facilities

were surveyed prior to HIT implementation. Therefore, the only inference is the appearance of a difference in the pooled data when considering "employee engagement."

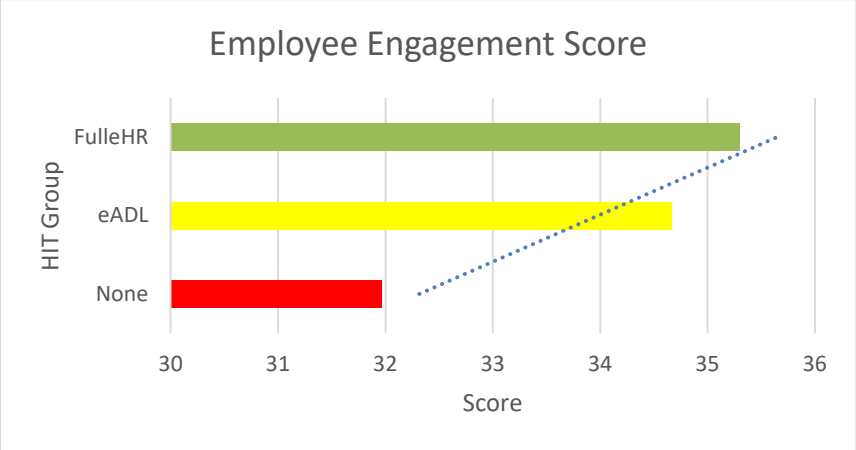

Figure 2: Employee Engagement Score

Staff Retention Rate

In an effort to improve overall staff retention, monthly measurement of the indicator was determined by the number of staff with over one year of service on the last day of the most recent month divided by the average monthly staff count for the last 12 months. The mean rate for the pooled data was (*M (SD)*) None 60.0%(11.9), eADL 60.1%(11.1), FulleHR 55.5%(12.4) unadjusted, and (*Madj (SE)),* 60.1%(.003), 60.2%(.004), 55.2%(.006), respectively (Figure 3).

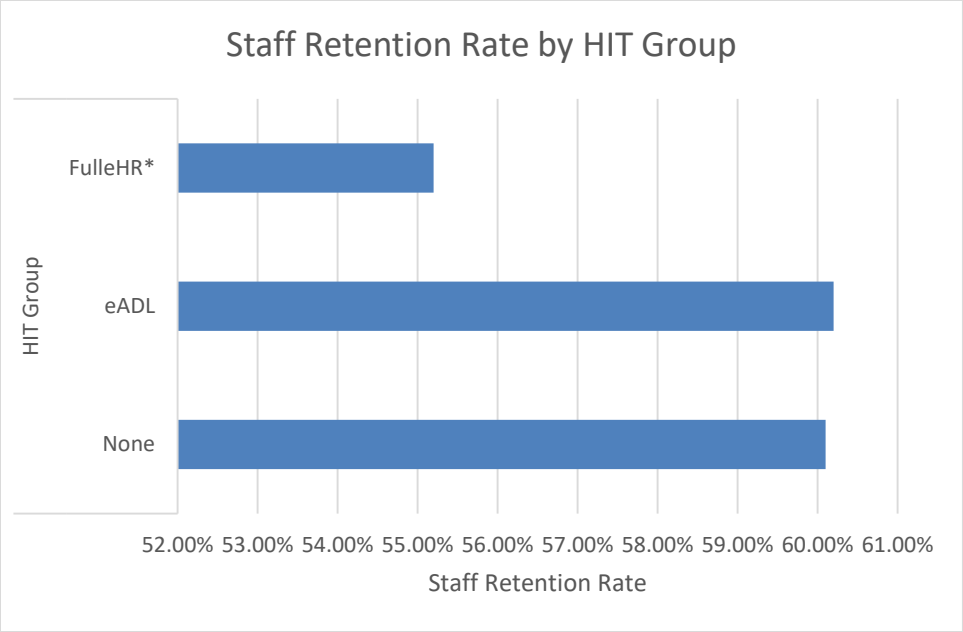

Figure 3: Staff Retention Rate by HIT Group

Only the difference in means for the full clinical EHR group was found to be significant and appears to negatively affect staff retention, 55% compared to 60% for both None and eADL groups.

Total Staff Turnover

The performance metric for staff turnover was calculated monthly and is the total number of terminations for the last 12 months divided by the average monthly staff count for the last 12 months as of the last date of the most recent month. The analysis results were significant for only the differences in means for the Full EHR group at 39.8%, compared to None 41.9% and eADL 41.4% (Figure 4).

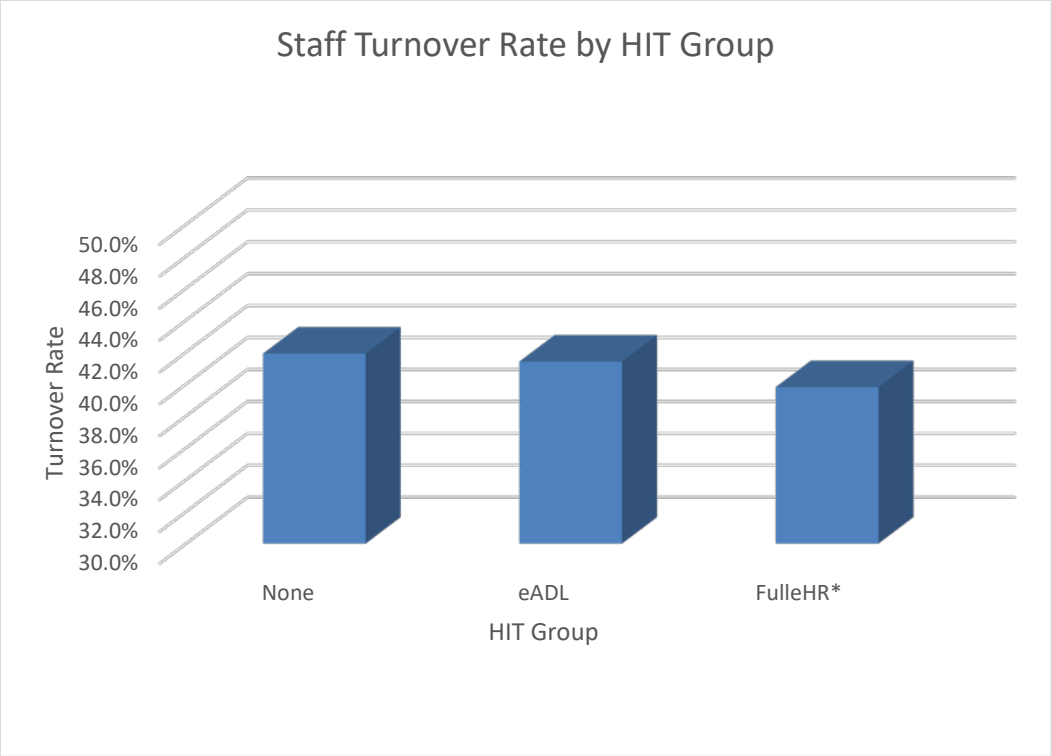

Figure 4: Staff Turnover Rate by HIT Group

Clinical Performance

There was a statistically significant difference in means for all clinical performance measures (Tables 5& 6) with the exception of failed revisits in the Full Clinical EHR group. However, given failed revisits is nominal and dichotomous, 0-1, facility either had a failed re-visit (1) or did not (0), we can only infer that the mean represents the mean percent of facilities having a revisit, which was found to be significant.

Table 4: Clinical Performance Indicators: Adjusted Means

ADJUSTED MEANS					
				Interval	
Clinical Performance Indicators		Mean	Std. Error	Lower Bound	Upper Bound
CMS 5 Star	None	*2.372[a]	0.031	2.312	2.432
	eADL	*2.038[a]	0.038	1.963	2.113
	FulleHR	*2.205[a]	0.057	2.092	2.317
CMS 5 Star Quality	None	*3.604[a]	0.032	3.542	3.667
	eADL	*3.028[a]	0.040	2.950	3.107
	FulleHR	*3.894[a]	0.060	3.776	4.012
Failed Revisit	None	*.081[a]	0.006	0.068	0.093
	eADL	*.051[a]	0.008	0.035	0.066
	FulleHR	.056[a]	0.012	0.033	0.080
Complaint Tags %	None	*25.124[a]	0.633	23.882	26.366
	eADL	*14.853[a]	0.795	13.295	16.412
	FulleHR	*23.936[a]	1.191	21.600	26.271
Facility Defficiency Index	None	*1.640[a]	0.027	1.586	1.693
	eADL	*1.621[a]	0.034	1.554	1.688
	FulleHR	*1.795[a]	0.051	1.694	1.895
Return to Hospital %	None	*17.520[a]	0.114	17.296	17.744
	eADL	*15.530[a]	0.143	15.249	15.812
	FulleHR	*16.597[a]	0.215	16.175	17.018

Note: a. Covariates appearing in the model are evaluated at the following values: % Skilled Patients = 19.6091%.

** =statistically significant difference (p<.0167) based on Bonferroni adjustment,*

95% confidence interval (CI) is simultaneos confidence interval based on Bonferroni adjustment

Table 5: Clinical Performance Indicators: Pairwise Comparisons

Pairwise Comparisons							
			Mean Difference (I-J)	Std. Error	Sig.[b]	Interval for Difference[b]	
Clinical Dependent Variable						Lower Bound	Upper Bound
CMS 5 Star	None	eADL	.335*	0.049	0.000	0.218	0.452
		FulleHR	.168*	0.066	0.032	0.011	0.325
	eADL	None	-.335*	0.049	0.000	-0.452	-0.218
		FulleHR	-0.167	0.070	0.051	-0.334	0.000
	FulleHR	None	-.168*	0.066	0.032	-0.325	-0.011
		eADL	0.167	0.070	0.051	0.000	0.334
CMS 5 Star Quality	None	eADL	.576*	0.051	0.000	0.454	0.698
		FulleHR	-.290*	0.069	0.000	-0.454	-0.125
	eADL	None	-.576*	0.051	0.000	-0.698	-0.454
		FulleHR	-.866*	0.073	0.000	-1.041	-0.691
	FulleHR	None	.290*	0.069	0.000	0.125	0.454
		eADL	.866*	0.073	0.000	0.691	1.041
Failed Revisit	None	eADL	.030*	0.010	0.009	0.006	0.054
		FulleHR	0.024	0.014	0.217	-0.008	0.057
	eADL	None	-.030*	0.010	0.009	-0.054	-0.006
		FulleHR	-0.005	0.014	1.000	-0.040	0.029
	FulleHR	None	-0.024	0.014	0.217	-0.057	0.008
		eADL	0.005	0.014	1.000	-0.029	0.040
Complaint Tags %	None	eADL	10.271*	1.013	0.000	7.845	12.697
		FulleHR	1.188	1.361	1.000	-2.072	4.448
	eADL	None	-10.271*	1.013	0.000	-12.697	-7.845
		FulleHR	-9.082*	1.447	0.000	-12.549	-5.615
	FulleHR	None	-1.188	1.361	1.000	-4.448	2.072
		eADL	9.082*	1.447	0.000	5.615	12.549
Facility Defficiency Index	None	eADL	0.019	0.044	1.000	-0.086	0.123
		FulleHR	-.155*	0.059	0.025	-0.296	-0.014
	eADL	None	-0.019	0.044	1.000	-0.123	0.086
		FulleHR	-.174*	0.062	0.017	-0.323	-0.024
	FulleHR	None	.155*	0.059	0.025	0.014	0.296
		eADL	.174*	0.062	0.017	0.024	0.323
Return to Hospital %	None	eADL	1.990*	0.183	0.000	1.552	2.427
		FulleHR	.923*	0.246	0.001	0.335	1.511
	eADL	None	-1.990*	0.183	0.000	-2.427	-1.552
		FulleHR	-1.066*	0.261	0.000	-1.692	-0.441
	FulleHR	None	-.923*	0.246	0.001	-1.511	-0.335
		eADL	1.066*	0.261	0.000	0.441	1.692

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

CMS Five Star Total Score

The mean CMS Five Star Total was 2.4 (No HIT), 2.0 (eADL), 2.2 (Full EHR). The preliminary analysis infers a negative effect on the Total Five Star score.

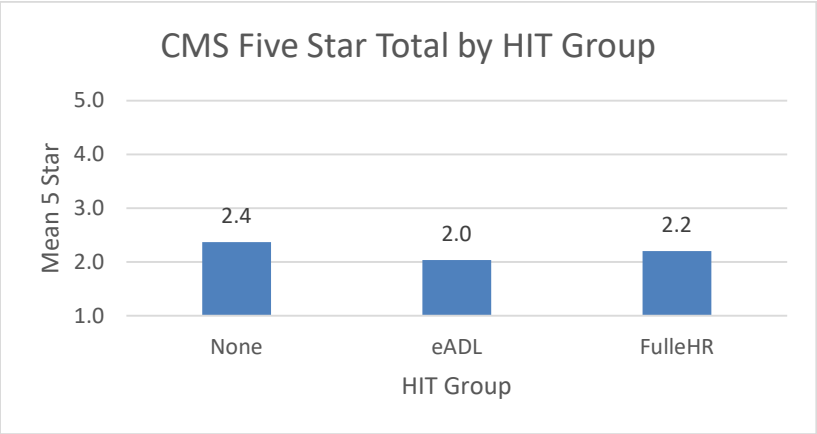

Figure 5: CMS Five Star Total Score by HIT Group

CMS Five Star Quality Measure

The results for the CMS Five Star Quality measure was a negative effect for eADL (3.03) and a positive effect for Full EHR (3.89) compared to No EHR (3.60). The Full EHR group was nearly 1 point higher than the eADL group in the 5 Star Quality score with a p<.001.

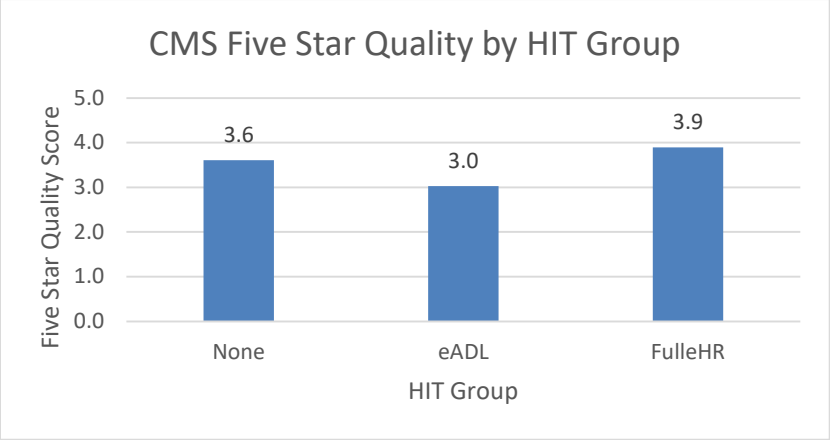

Figure 6: CMS Five Star Quality Score by HIT Group

Complaint Tags

Complaint tags are complaint deficiencies as a percentage of a center's total Survey Tags as reported by CMS. Complaints that did not result in a tag were not reflected in this percentage. Complaint tags as a percent of total CMS survey tags was higher in the No HIT group than both the eADL and Full EHR. But, the eADL group was also significantly lower than the Full EHR group, 25.1%, 14.9% and 23.9% respectively.

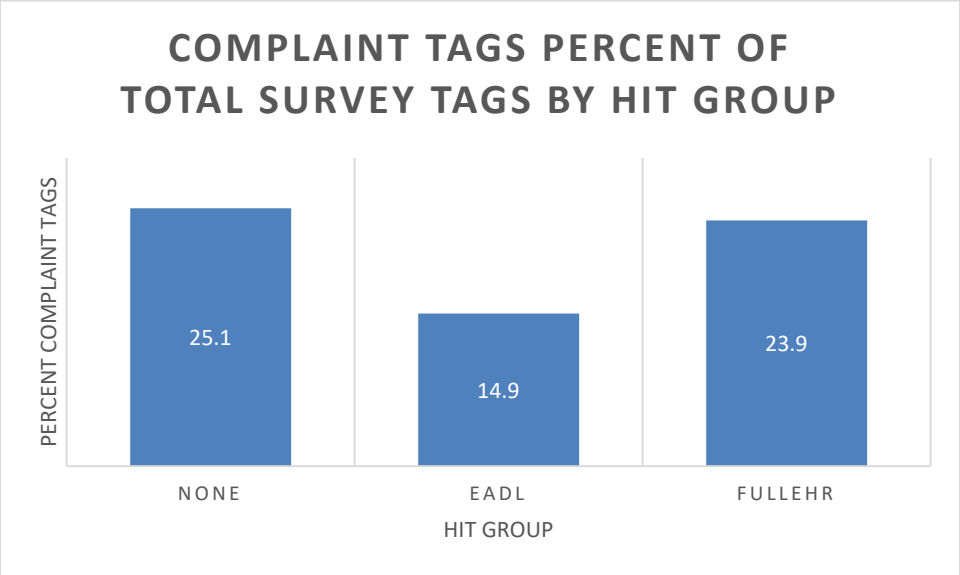

Figure 7: Complaint Tags Percent by HIT Group

Facility Deficiency Index

The Facility Deficiency Index (FDI) is the total facility health deficiencies divided by the state average of facility health deficiencies reported by CMS. The differences in means were found to be significant only between None compared to FulleHR ($p=0.025$) and eADL compared to FulleHR ($p=0.17$) but not between None and eADL ($p>1.000$) HIT Groups, None 1.640, eADL 1.621 and FulleHR 1.795.

Failed Survey Revisits

Failed survey revisits (FSR) was measured as a center with more than one revisit in Cycle 1 was considered to have a failed revisit. FSR was only significant between None (.081) and eADL (.051) (p=.009). None compared to Full EHR (.056) (p=0.217) and eADL compared to Full EHR (p>1.000) were not significant.

Return to hospital (readmissions)

The Return to Hospital (RTH) rate was calculated as the number of patients admitted from and discharged to an acute care hospital within 30 days of admission divided by the number of patients admitted from an acute care hospital. Differences between means for RTH were significant between all categories of HIT Groups (M, SE). None (15.52%, 0.114), eADL (15.53%, 0.143) and Full EHR (16.60%, 0.215) (p<.001).

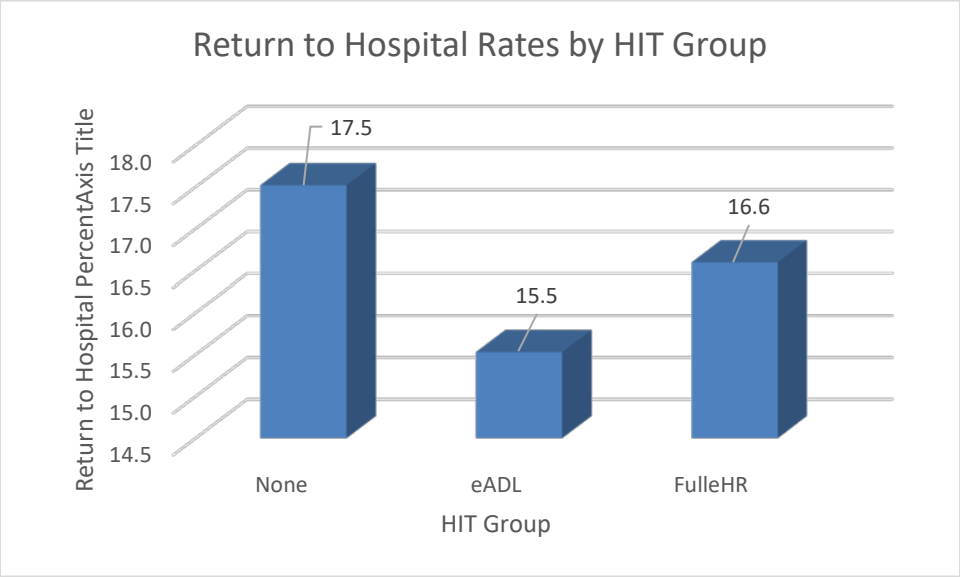

Figure 8: Return to Hospital Rates by HIT Group

Financial Performance

Analysis of the indicators for financial performance determined that the measurement for bad debt percentage and revenue performance against budget were not significant. Only overtime was found to be significant for the eADL group at 5.34% compared to 6.79% for the no HIT group and 6.71% for the Full Clinical EHR group of facilities (Figure 9).

Table 6: Financial Performance Indicators: Adjusted Means

ADJUSTED MEANS					
				Interval	
Financial Performance Indicators		Mean	Std. Error	Lower Bound	Upper Bound
Over Time %	None	*6.793[a]	0.071	6.653	6.933
	eADL	*5.342[a]	0.089	5.167	5.517
	FulleHR	*6.709[a]	0.134	6.447	6.972
Bad Debt %	None	.194[a]	0.151	-0.102	0.489
	eADL	.592[a]	0.189	0.222	0.963
	FulleHR	.159[a]	0.283	-0.397	0.714
Revenue % of Budget	None	782.541[a]	544.464	-285.016	1850.099
	eADL	-88.834[a]	683.217	-1428.452	1250.784
	FulleHR	416.386[a]	1023.752	-1590.936	2423.707

Note: a. Covariates appearing in the model are evaluated at the following values: % Skilled Patients = 19.6091%.

** =statistically significant difference (p<.0167) based on Bonferroni adjustment,*

95% confidence interval (CI) is simultaneos confidence interval based on Bonferroni adjustment

Table 7: Financial Performance Indicators: Pairwise Comparisons

Pairwise Comparisons							
			Mean Difference (I-J)	Std. Error	Sig.[b]	Interval for Difference[b]	
Financial Dependent Variable						Lower Bound	Upper Bound
Over Time %	None	eADL	1.451*	0.114	0.000	1.178	1.723
		FulleHR	0.084	0.153	1.000	-0.283	0.450
	eADL	None	-1.451*	0.114	0.000	-1.723	-1.178
		FulleHR	-1.367*	0.163	0.000	-1.757	-0.978
	FulleHR	None	-0.084	0.153	1.000	-0.450	0.283
		eADL	1.367*	0.163	0.000	0.978	1.757
Bad Debt %	None	eADL	-0.399	0.241	0.294	-0.976	0.178
		FulleHR	0.035	0.324	1.000	-0.741	0.811
	eADL	None	0.399	0.241	0.294	-0.178	0.976
		FulleHR	0.434	0.344	0.624	-0.391	1.259
	FulleHR	None	-0.035	0.324	1.000	-0.811	0.741
		eADL	-0.434	0.344	0.624	-1.259	0.391
Revenue % of Budget	None	eADL	871.375	870.558	0.951	-1213.884	2956.635
		FulleHR	366.156	1169.898	1.000	-2436.117	3168.429
	eADL	None	-871.375	870.558	0.951	-2956.635	1213.884
		FulleHR	-505.219	1244.190	1.000	-3485.446	2475.007
	FulleHR	None	-366.156	1169.898	1.000	-3168.429	2436.117
		eADL	505.219	1244.190	1.000	-2475.007	3485.446

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Staff overtime

Staff overtime was only found to be significant in the eADL Group (MD -1.451, SE 0.114 p<.001)

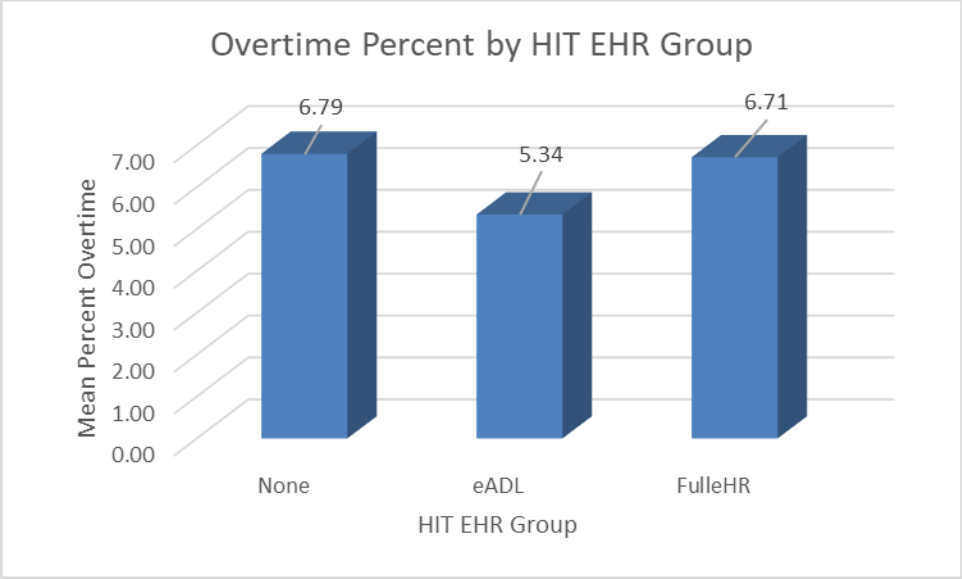

Figure 9: Staff Overtime by HIT EHR Group

Bad Debt

Bad debt measurement is YTD Bad Debt divided by YTD Revenue. This performance indicator was found to not be significant in the Pairwise analysis (Table 7).

Revenue performance against budget

Revenue performance indicator defined as EBITDAR (total revenue minus management expenses and operating expenses) was calculated and reported as a percent over or under budgeted EBITDAR. This indicator was not significant for any of the means comparisons.

Hypotheses Testing Results Summary

$H1_0$ The use of an electronic health record (EHR) module for activities of daily living (ADL) (eADL). HIT has no effect on operational processes at LTPACs.

$H1_a$ The use of an eADL HIT positively effects operational processes at LTPACs.

eADL positively affected employee engagement but had no effect on staff retention or turnover. Given the time lag in employee engagement surveys, these results may be erroneous. Therefore, the null hypothesis $H1_0$ is not rejected.

$H2_0$ The use of an eADL has no effect on clinical outcomes at LTPACs.

$H2_a$ The use of an eADL positively affects clinical outcomes at LTPACs.

The null hypothesis is rejected. eADL use had a negative effect on CMS Five Star Total and CMS Five Star Quality, a positive effect on complaint tags, failed revisits and return to hospital, but no effect on facility health index.

$H3_0$ The use of an eADL had no effect on financial performance at LTPACs.

H3a The use of an eADL positively affects financial performance at LTPACs.

The null hypothesis is partially rejected as eADL was associated with a reduction in overtime but had no effect on bad debt or revenue performance to budget.

$H4_0$ The use of a Full Clinical electronic health record (Full EHR) has no effect on operational processes at LTPACs.

$H4_a$ The use of a Full Clinical electronic health record (Full EHR) positively affects operational processes at LTPACs.

The null hypothesis is rejected for operational processes ($p<.001$), the Full EHR group had the highest employee engagement mean score (positive effect), the lowest staff retention rate (negative effect) and the lowest staff turnover rate (positive effect).

$H5_0$ The use of a Full EHR has no effect on clinical outcomes at LTPACs.

$H5_a$ The use of a Full EHR positively affects clinical outcomes at LTPACs.

The null hypothesis is rejected, ($p<.001$). Full EHR had a negative effect on CMS Five Star total, positive effect on CMS Five Star Quality, positive effect on complaint

tags, negative effect on Facility Deficiencies and a positive effect on reducing hospital re-admissions.

$H6_0$ The use of a Full EHR has no effect on financial performance at LTPACs.

H6a The use of a Full EHR positively affects financial performance at LTPACs.

The null hypothesis was rejected as overtime, comparing Full EHR to eADL (1.37 $p<.001$), Full EHR Group had higher mean overtime rate than eADL Group. So, Full EHR negatively affected financial performance.

Chapter V:

Conclusion

The LTPAC sector of healthcare is becoming a central point in the overall transitions of the care landscape. Patient transitions from home to an acute care hospital to LTPACs and back home, often to home health care, are frequently complicated by failures in communication and medication errors. A report from the National Transition of Care Coalition found "an estimated 60% of medication errors occur during times of transition" (HealthIT.gov, 2013). The use of HIT has long been expected to improve financial performance through cost reduction, improved clinical outcomes and improved coordination of care. However, the use of EHR technology in LTPAC facilities seems to be lagging other sectors, possibly due to a lack of federal subsidies provided to other sectors. In addition to being excluded from Medicare and Medicaid EHR Incentive Programs, LTPAC facilities experience other barriers that affect HIT adoption and use. These inhibitors include lack of staff, lack of financial capacity to acquire HIT and lack of leadership to prioritize HIT adoption. Emerging and evolving payment and service delivery models make it increasingly important for LTPACs to implement and adopt HIT to support these new models.

In an effort to build support for HIT adoption in LTPAC, this body of research was initiated. As noted in the descriptive statistics, the study LTPAC Company, as of June 30, 2017, had implemented some level of HIT in 58% of the 168 facilities included in the study. The company identified the Key Performance Indicators (dependent variables) which were a focus of the study. The results of the preliminary analysis suggest some, but not all, may be appropriate

indicators for study. Primarily, the clinical performance indicators (the CMS Five Star Quality, complaint tags, failed revisits and return to hospital and possibly, facility health index) were found suggestive of further study. Operations performance indicators (employee engagement, staff retention and staff turnover) appear to be reasonable indicators. While there was a statistically significant difference between HIT groups for employee engagement, any inference should be limited as only one annual employee survey result was applied to all 18 months of data as provided by the company. Therefore, the only inference is there appears to be a difference in the pooled data when considering "employee engagement." Therefore, this performance indicator may only be of value in future prospective studies if the company increases the frequency of employee engagement surveys to monthly, quarterly or semiannually.

In general, HIT with a partial EMR (eADL) and Full Clinical EHR had varied effects on performance indicators in all three categories (Operational, Clinical and Financial), although not all indicators were affected. The overall analysis of the MANCOVA of combined indicators for all 18 months of data was significant

The one-way MANCOVA showed a statistically significant difference between the HIT EHR groups on the combined dependent variables after controlling for skilled percent mix, $F(24,6018) = 38.744$, $p < .0005$, Wilks' $\Lambda = .750$, partial $\eta 2 = .134$.

Financial performance indicators should be expanded to include gross and net revenue per occupied bed, and gross and net revenue per licensed bed. The dependent variables bad debt and performance to budget may prove to be of value in future analyses, which include time series. Clearly, MANCOVA and ANOVA analysis of this data was merely preliminary. Given the complexity of the data, panel data methods were determined to be the most appropriate methods

to further analyze these data. Extensive Panel Data analysis was beyond the scope of this dissertation.

As described previously, the data provided are longitudinal or cross-sectional time-series data. In many cases, there are data for time periods before and after HIT implementation. The data also represent over 170 different LTPAC facilities across the company and covers multiple states and regions. The preliminary analysis of the data indicates panel analysis for fixed effects models and random effects models. Given the heterogeneity of some indicators, a fixed effects model may provide for exploration of the relationship of HIT and other predictors on a variety of outcome variables: operational, financial and clinical. Other data, like failed revisit surveys, are nominal and dichotomous, making those indicators more suitable to logistical regression (LOGIT) analysis.

Given the diversity and complexity of the study company's facilities, there is rationale for a random effects (RE) model, given the potential for variation across LTPAC facilities. This model is also appropriate to test, given the possibility that differences among the facilities may have some influence on the dependent variables chosen. RE allows for generalization of the inferences beyond this preliminary analysis. Perhaps one of the most promising findings of the Pooled study was the differences in means for hospital readmissions.

Contributors to Hospital Readmissions

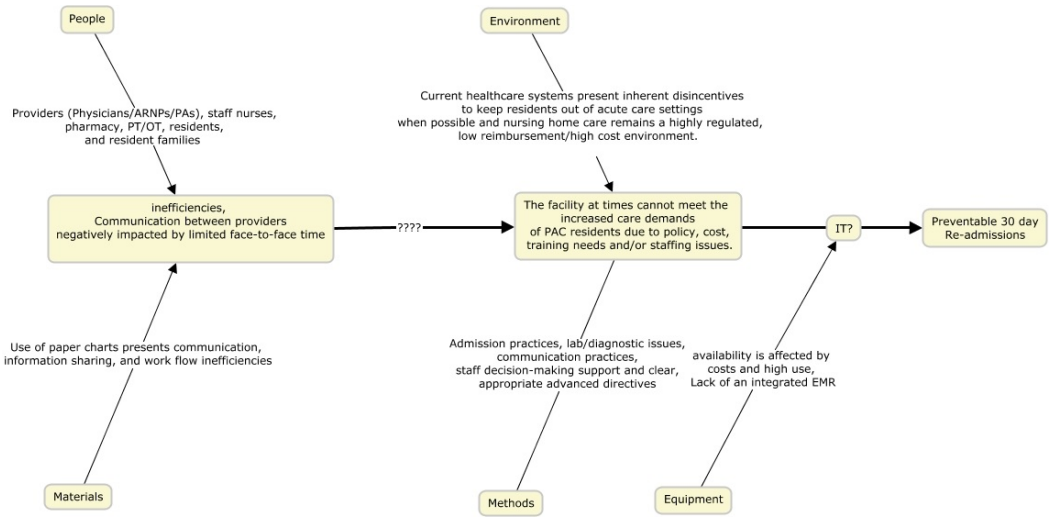

Figure 10: Contributors to Hospital Readmissions

Readmissions to acute care hospitals from home and LTPACs is one of the costliest factors in today's health and medical care landscape. If these findings are sustained in future panel analysis, they may prove to be the "silver bullet," providing the return on investment needed to support the capital investment of HIT in the LTPAC sector.

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Appendices

Appendix 1

Long Term Care Minimum Data Set 3.0

Variable List:

* = Limitations and/or code table are available for variable.

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
1	BENE_ID	Encrypted CCW Beneficiary ID	*	
2	ASMT_ID	Encrypted Assessment ID		
3	TRGT_DT	Target Date (Date of Assessment)		
4	STATE_CD	State Code (for assessments)		*
5	FACINTID	Facility Internal ID		*
6	MDS_ASMT_ID	Encrypted MDS Assessment Internal ID		
7	MDS_ITM_SBST_CD	Item Subset Code (ISC)		*
8	SBMSSNDT	Submission Date		
9	MDS_SUBMSN_ID	Submission ID		
10	RQRD_SUBMSN_CD	Submission Required Code (SUB_REQ)		*
11	C_BIRTH_DT_SBMT_CD	Birth Date Submit Code		
12	CRRCTNNM	Correction Number		
13	MDS_CRCTN_STUS_CD	Correction Status Code		*
14	SPEC_VRSN_CD	Data Submission Specification Version Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
15	FAC_DOC_ID	Facility Document Idenitifier		
16	ITM_SET_VRSN_CD	Item Set Version Code		
17	ORGNL_ASMT_ID	Encrypted Original Assessment ID		
18	V0100F_PRIOR_STF_MOOD_SCRE_NUM	Prior Assessment Staff Assessment of Resident Mood (PHQ-9) Total Severity Score Number		
19	PRCSD_TS	Processed Timestamp		
20	C_RSDNT_AGE_NUM	Resident Age		
21	RSDNT_MATCH_CRTIA_ID	Resident Match Criteria ID		
22	SFTWR_PROD_NAME	Software Product Name		
23	SFTWR_PROD_VRSN_CD	Software Product Version		
24	SFTW_ID	Software Vendor ID		
25	C_URBN_RRL_CD	CBSA Urban/Rural Code		
26	C_MDCR_HIPPS_TXT	Recalculated Z0100A		
27	C_MDCR_RUG_VRSN_TXT	Recalculated Z0100B		
28	C_MDCR_STAY_CD	Recalculated Z0100C		
29	C_MDCR_SET_CD	CMI Set for Recalculated Z0100A		
30	C_MDCR_CMI_TXT	CMI Value for Recalculated Z0100A		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
31	C_MDCR_NT_HIPPS_TXT	Recalculated Z0150A		
32	C_MDCR_NT_RUG_VRSN_TXT	Recalculated Z0150B		
33	C_MDCR_NT_SET_CD	CMI Set for Recalculated Z0150A		
34	C_MDCR_NT_CMI_TXT	CMI Value for Recalculated Z0150A		
35	C_STATE_RUG_GRP_TXT	Recalculated Z0200A		
36	C_STATE_RUG_VRSN_TXT	Recalculated Z0200B		
37	C_STATE_SET_CD	CMI Set for Recalculated Z0200A		
38	C_STATE_CMI_TXT	CMI Value for Recalculated Z0200A		
39	C_STATE_2_RUG_GRP_TXT	Recalculated Z0250A		
40	C_STATE_2_RUG_VRSN_TXT	Recalculated Z0250B		
41	C_STATE_2_SET_CD	CMI Set for Recalculated Z0250A		
42	C_STATE_2_CMI_TXT	CMI Value for Recalculated Z0250A		
43	C_MDCR_RUG3_IDX_MAX_GRP_TXT	Medicare RUG III Index Maximized Group		
44	C_MDCR_RUG3_IDX_MAX_VRSN_TXT	Medicare RUG III Index Maximized Version		
45	C_MDCR_RUG3_IDX_MAX_CMI_SET_CD	Medicare RUG III Index Maximized CMI Set		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
46	C_MDCR_RUG3_IDX_MAX_CMI_TXT	Medicare RUG III Index Maximized CMI Value		
47	C_MDCR_RUG3_HIRCHCL_GRP_TXT	Medicare RUG III Hierarchical Group		
48	C_MDCR_RUG3_HIRCHCL_VRSN_TXT	Medicare RUG III Hierarchical Version		
49	C_MDCR_RUG4_HIRCHCL_GRP_TXT	Medicare RUG IV Hierarchical Group		
50	C_MDCR_RUG4_HIRCHCL_VRSN_TXT	Medicare RUG IV Hierarchical Version		
51	A0100A_NPI_NUM	A0100A Facility National Provider Identifier (NPI)		
52	A0100B_CMS_CRTFCTN_NUM	A0100B Facility CMS Certification Number (CCN)		
53	A0100C_STATE_PRVDR_NUM	A0100C State Provider Number		
54	A0200_PRVDR_TYPE_CD	A0200 Type of Provider		*
55	A0310A_FED_OBRA_CD	A0310A Federal OBRA Reason for Assessment Code		*
56	A0310B_PPS_CD	A0310B PPS Assessment Code		*
57	A0310C_PPS_OMRA_CD	A0310C PPS Other Medicare Required Assessment (OMRA) Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
58	A0310D_SB_CLNCL_CHG_CD	A0310D Swing Bed Clinical Change Code		*
59	A0310E_FIRST_SINCE_ADMSN_CD	A0310E First Assessment Since Most Recent Admission Code		*
60	A0310F_ENTRY_DSCHRG_CD	A0310F Entry/Discharge Code		*
61	A0410_RQRD_SUBMSN_CD	A0410 Submission Required Code		*
62	A0800_GNDR_CD	A0800 Gender		*
63	A0900_BIRTH_DT	A0900 Birth Date		
64	A1000A_AMRCN_INDN_AK_NTV_CD	A1000A Race/Ethnicity: American Indian or Alaskan Native Code		*
65	A1000B_ASN_CD	A1000B Race/Ethnicity: Asian Code		*
66	A1000C_AFRCN_AMRCN_CD	A1000C Race/Ethnicity: African American Code		*
67	A1000D_HSPNC_CD	A1000D Race/Ethnicity: Hispanic Code		*
68	A1000E_NTV_HI_PCFC_ISLNDR_CD	A1000E Race/Ethnicity: Native Hawaiian/Pacific Islander Code		*
69	A1000F_WHT_CD	A1000F Race/Ethnicity: White Code		
70	A1100A_NEED_INTRPTR_CD	A1100A Resident Need Interpreter Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
71	A1100B_INTRPTR_LANG_TXT	A1100B Preferred Language		
72	A1200_MRTL_STUS_CD	A1200 Marital Status Code		*
73	A1300A_MDCL_REC_NUM	A1300A Medical Record Number		
74	A1300B_ROOM_NUM	A1300B Room Number		
75	A1300C_PREFRD_NAME	A1300C Preferred Name		
76	A1300D_LFTM_OCPTN_TXT	A1300D Lifetime Occupation(s) Text		
77	A1500_PASRR_CD	A1500 Preadmission Screening and Resident Review (PASRR) Code		*
78	A1550A_DOWN_SYNDRM_CD	A1550A MR/DD Status: Down Syndrome Code		*
79	A1550B_AUTSM_CD	A1550B MR/DD Status: Autism Code		*
80	A1550C_EPLPSY_CD	A1550C MR/DD Status: Epilepsy Code		*
81	A1550D_OTHR_ORGNC_MR_DD_CD	A1550D MR/DD Status: Other Organic MR/DD Condition Code		*
82	A1550E_OTHR_MR_DD_CD	A1550E MR/DD Status: MR/DD With No Organic Condition Code		*
83	A1550Z_NO_MR_DD_CD	A1550Z MR/DD Status: None of the Above		*
84	A1600_ENTRY_DT	A1600 Entry Date		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
85	A1700_ENTRY_TYPE_CD	A1700 Type of Entry Code		*
86	A1800_ENTRD_FROM_TXT	A1800 Entered From Code		
87	A2000_DSCHRG_DT	A2000 Discharge Date		
88	A2100_DSCHRG_STUS_CD	A2100 Discharge Status Code		*
89	A2200_PRVS_ASMT_RFRNC_DT	A2200 Previous Assessment Reference Date For Significant Correction		
90	A2300_ASMT_RFRNC_DT	A2300 Assessment Reference Date		
91	A2400A_MDCR_STAY_CD	A2400A Has Resident Had a Medicare Stay Code Since Most Recent Admission		*
92	A2400B_MDCR_STAY_STRT_DT	A2400B Start Date of Most Recent Medicare Stay		
93	A2400C_MDCR_STAY_END_DT	A2400C End Date of Most Recent Medicare Stay		
94	B0100_CMTS_CD	B0100 Comatose Code		*
95	B0200_HEARG_CD	B0200 Hearing Code		*
96	B0300_HEARG_AID_CD	B0300 Hearing Aide Code		*
97	B0600_SPCH_CLRTY_CD	B0600 Speech Clarity Code		*
98	B0700_SELF_UNDRSTOD_CD	B0700 Makes Self Understood Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
99	B0800_UNDRST_OTHR_CD	B0800 Ability to Understand Others Code		*
100	B1000_VSN_CD	B1000 Vision Code		*
101	B1200_CRCTV_LENS_CD	B1200 Corrective Lenses Code		*
102	C0100_CNDCT_MENTL_STUS_CD	C0100 Brief Interview for Mental Status Be Conducted Code		*
103	C0200_WORD_RPET_FIRST_ATMPT_CD	C0200 BIMS: Number of Words Repeated After First Attempt		*
104	C0300A_RPT_CRCT_YR_CD	C0300A BIMS: Temporal Orientation - Able to Report Correct Year		*
105	C0300B_RPT_CRCT_MO_CD	C0300B BIMS: Temporal Orientation - Able to Report Correct Month		*
106	C0300C_RPT_CRCT_DAY_CD	C0300C BIMS: Temporal Orientation - Able to Report Correct Day of Week		*
107	C0400A_RCALL_FIRST_WORD_CD	C0400A BIMS: Recall - Able to Recall Sock		*
108	C0400B_RCALL_SCND_WORD_CD	C0400B BIMS: Recall - Able to Recall Blue		*
109	C0400C_RCALL_THRD_WORD_CD	C0400C BIMS: Recall - Able to Recall Bed		*
110	C0500_BIMS_SCRE_NUM	C0500 Brief Interview for Mental Status (BIMS) Score Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
111	C0600_CNDCT_STF_MENTL_STUS_CD	C0600 Staff to Conduct Brief Interview for Mental Status		*
112	C0700_SHRT_TERM_MEMRY_CD	C0700 Staff Assessment of Mental Status - Short Term Memory Code		
113	C0800_LT_MEMRY_CD	C0800 Staff Assessment of Mental Status - Long Term Memory Code		*
114	C0900A_RCALL_CRNT_SEASN_CD	C0900A Staff Assessment of Mental Status - Recalls Current Season Code		*
115	C0900B_RCALL_LCTN_ROOM_CD	C0900B Staff Assessment of Mental Status - Recalls Location of Room Code		*
116	C0900C_RCALL_STF_NAME_CD	C0900C Staff Assessment of Mental Status - Recalls Staff Name Code		*
117	C0900D_RCALL_NH_CD	C0900D Staff Assessment of Mental Status - Recalls Nursing Home Code		*
118	C0900Z_RCALL_NONE_CD	C0900Z Staff Assessment of Mental Status - Recalls None of Above Code		*
119	C1000_DCSN_MKNG_CD	C1000 Cognitive Skills for Decision Making Code		*
120	C1300A_INATTNTN_CD	C1300A Signs and Symptoms of Delirium - Inattention		*
121	C1300B_DISORGNZ_THNKG_CD	C1300B Signs and Symptoms of Delirium - Disorganized Thinking		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
122	C1300C_ALTRD_CONSCS_CD	C1300C Signs and Symptoms of Delirium - Altered Level of Consciousness		*
123	C1300D_PSYCHMTR_RTRDTN_CD	C1300D Signs and Symptoms of Delirium - Psychomotor Retardation		*
124	C1600_CHG_MENTL_STUS_CD	C1600 Acute Onset Mental Status Change		*
125	D0100_CNDCT_MOOD_CD	D0100 Resident Mood Interview Be Conducted Code		*
126	D0200A1_INTRST_LOSS_CD	D0200A1 Resident Mood Interview - Interest Loss Code		*
127	D0200A2_INTRST_LOSS_FREQ_CD	D0200A2 Resident Mood Interview - Interest Loss Frequency Code		*
128	D0200B1_FEEL_DOWN_CD	D0200B1 Resident Mood Interview - Feel Down Code		*
129	D0200B2_FEEL_DOWN_FREQ_CD	D0200B2 Resident Mood Interview - Feel Down Frequency Code		*
130	D0200C1_TRBL_SLEEP_CD	D0200C1 Resident Mood Interview - Trouble Sleep Code		*
131	D0200C2_TRBL_SLEEP_FREQ_CD	D0200C2 Resident Mood Interview - Trouble Sleep Frequency Code		*
132	D0200D1_LTL_ENRGY_CD	D0200D1 Resident Mood Interview - Little Energy Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
133	D0200D2_LTL_ENRGY_FREQ_CD	D0200D2 Resident Mood Interview - Little Energy Frequency Code		*
134	D0200E1_POOR_APTIT_CD	D0200E1 Resident Mood Interview - Poor Appetite Code		*
135	D0200E2_POOR_APTIT_FREQ_CD	D0200E2 Resident Mood Interview - Poor Appetite Frequency Code		*
136	D0200F1_SELF_DPRCTN_CD	D0200F1 Resident Mood Interview - Self Depreciation Code		*
137	D0200F2_SELF_DPRCTN_FREQ_CD	D0200F2 Resident Mood Interview - Self Depreciation Frequency Code		*
138	D0200G1_CNCNTRTN_CD	D0200G1 Resident Mood Interview - Lack of Concentration Code		*
139	D0200G2_CNCNTRTN_FREQ_CD	D0200G2 Resident Mood Interview - Lack of Concentration Frequency Code		*
140	D0200H1_MVMT_DFRNT_CD	D0200H1 Resident Mood Interview - Movement Different Code		*
141	D0200H2_MVMT_DFRNT_FREQ_CD	D0200H2 Resident Mood Interview - Movement Different Frequency Code		*
142	D0200I1_NGTV_STATE_CD	D0200I1 Resident Mood Interview - Negative Statement Code		*
143	D0200I2_NGTV_STATE_FREQ_CD	D0200I2 Resident Mood Interview - Negative Statement Frequency Code		*
144	D0300_MOOD_SCRE_NUM	D0300 Resident Mood Interview - Total Severity Mood Score Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
145	D0350_NGTV_STATE_NTFY_STF_CD	D0350 Resident Mood Interview - Negative Statements Notify Staff Code		*
146	D0500A1_STF_INTRST_LOSS_CD	D0500A1 Staff Assessment of Resident Mood - Interest Loss Code		*
147	D0500A2_STF_INTRSTLOSS_FREQ_CD	D0500A2 Staff Assessment of Resident Mood - Interest Loss Frequency Code		*
148	D0500B1_STF_FEEL_DOWN_CD	D0500B1 Staff Assessment of Resident Mood - Feel Down Code		*
149	D0500B2_STF_FEEL_DOWN_FREQ_CD	D0500B2 Staff Assessment of Resident Mood - Feel Down Frequency Code		*
150	D0500C1_STF_TRBL_SLEEP_CD	D0500C1 Staff Assessment of Resident Mood - Trouble Sleep Code		*
151	D0500C2_STF_TRBL_SLEEP_FREQ_CD	D0500C2 Staff Assessment of Resident Mood - Trouble Sleep Frequency Code		*
152	D0500D1_STF_LTL_ENRGY_CD	D0500D1 Staff Assessment of Resident Mood - Little Energy Code		*
153	D0500D2_STF_LTL_ENRGY_FREQ_CD	D0500D2 Staff Assessment of Resident Mood - Little Energy Frequency Code		*
154	D0500E1_STF_POOR_APTIT_CD	D0500E1 Staff Assessment of Resident Mood - Poor Appetite Code		*
155	D0500E2_STF_POOR_APTIT_FREQ_CD	D0500E2 Staff Assessment of Resident Mood - Poor Appetite Frequency Code		*
156	D0500F1_STF_SELF_DPRCTN_CD	D0500F1 Staff Assessment of Resident Mood - Self Depreciation Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
157	D0500F2_STF_SELFDPRCTN_FREQ_CD	D0500F2 Staff Assessment of Resident Mood - Self Depreciation Frequency Code		*
158	D0500G1_STF_CNCNTRTN_CD	D0500G1 Staff Assessment of Resident Mood - Concentration Code		*
159	D0500G2_STF_CNCNTRTN_FREQ_CD	D0500G2 Staff Assessment of Resident Mood - Concentration Frequency Code		*
160	D0500H1_STF_MVMT_DFRNT_CD	D0500H1 Staff Assessment of Resident Mood - Movement Different Code		*
161	D0500H2_STF_MVMT_DFRNT_FREQ_CD	D0500H2 Staff Assessment of Resident Mood - Movement Different Frequency Code		*
162	D0500I1_STF_NGTV_STATE_CD	D0500I1 Staff Assessment of Resident Mood - Negative Statement Code		*
163	D0500I2_STF_NGTV_STATE_FREQ_CD	D0500I2 Staff Assessment of Resident Mood - Negative Statement Frequency Code		*
164	D0500J1_STF_SHRT_TMPR_CD	D0500J1 Staff Assessment of Resident Mood - Short Temper Code		*
165	D0500J2_STF_SHRT_TMPR_FREQ_CD	D0500J2 Staff Assessment of Resident Mood - Short Temper Frequency Code		*
166	D0600_STF_MOOD_SCRE_NUM	D0600 Staff Assessment Total Severity Mood Score		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
167	D0650_STF_NGTV_STATE_NTFY_CD	D0650 Staff Assessment of Resident Mood - Negative Statement Notify Code		*
168	E0100A_HLLCNTN_CD	E0100A Behavior: Hallucinations Code		*
169	E0100B_DLSN_CD	E0100B Behavior: Delusion Code		*
170	E0100Z_NO_PSYCHOSIS_CD	E0100Z Behavior: No Psychosis Code		*
171	E0200A_PHYS_BHVRL_CD	E0200A Behavior: Physical Behavioral Code		*
172	E0200B_VRBL_BHVRL_CD	E0200B Behavior: Verbal Behavioral Code		*
173	E0200C_OTHR_BHVRL_CD	E0200C Behavior: Other Behavioral Code		*
174	E0300_BHVR_PRSNT_CD	E0300 Overall Presence of Behavioral Symptoms		*
175	E0500A_BHVR_INJR_SELF_CD	E0500A Behavior Impact on Resident: Risk to Injure Self		*
176	E0500B_BHVR_INTRFR_CARE_CD	E0500B Behavior Impact on Resident: Interferes With Care		*
177	E0500C_BHVR_INTRFR_PRTCPTN_CD	E0500C Behavior Impact on Resident: Interferes With Participation		*
178	E0600A_BHVR_INJR_OTHR_CD	E0600A Behavior Impact on Others: Risk to Injure Others		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
179	E0600B_BHVR_INTRD_PRVCY_CD	E0600B Behavior Impact on Others: Intrude On Privacy of Others		*
180	E0600C_BHVR_DSRUPT_ENVRMNT_CD	E0600C Behavior Impact on Others: Disrupt Care or Living Environment		*
181	E0800_RJCT_EVALTN_CD	E0800 Rejection of Care: Presence and Frequency		*
182	E0900_WNDR_CD	E0900 Wandering: Presence and Frequency		*
183	E1000A_WNDR_RISK_CD	E1000A Wander Risk Impact		*
184	E1000B_WNDR_INTRD_PRVCY_CD	E1000B Wandering Intrudes on Privacy of Others		*
185	E1100_BHVR_CHG_PRIOR_CD	E1100 Change in Behavior or Other Symptoms		*
186	F0300_CNDCT_ACTVTY_CD	F0300 Should Daily and Activity Preference Interview Be Conducted		*
187	F0400A_DRESS_CD	F0400A Interview for Daily Preferences: Chooses Clothes Code		*
188	F0400B_CARE_PRSNL_ITM_CD	F0400B Interview for Daily Preferences: Care Personal Items Code		*
189	F0400C_BATHG_OPTN_CD	F0400C Interview for Daily Preferences: Bathing Option Code		*
190	F0400D_SNACK_BTWN_CD	F0400D Interview for Daily Preferences: Snack Between Meals Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
191	F0400E_BED_TIME_CD	F0400E Interview for Daily Preferences: Choose Bed Time Code		*
192	F0400F_FMLY_INVLVMT_CD	F0400F Interview for Daily Preferences: Family Involvement Code		*
193	F0400G_PRVT_PHNE_CD	F0400G Interview for Daily Preferences: Private Phone Time Code		*
194	F0400H_LOCK_ITM_CD	F0400H Interview for Daily Preferences: Lock Item Code		*
195	F0500A_READG_AVLBL_CD	F0500A Interview for Activity Preferences: Reading Materials Available Code		*
196	F0500B_MUSIC_CD	F0500B Interview for Activity Preferences: Music Code		*
197	F0500C_ANML_CD	F0500C Interview for Activity Preferences: Animal Presence Code		*
198	F0500D_NEWS_CD	F0500D Interview for Activity Preferences: News Code		*
199	F0500E_GRP_ACTVTY_CD	F0500E Interview for Activity Preferences: Group Activity Code		*
200	F0500F_FVRT_ACTVTY_CD	F0500F Interview for Activity Preferences: Favorite Activity Code		*
201	F0500G_FRSH_AIR_CD	F0500G Interview for Activity Preferences: Time Outdoors Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
202	F0500H_RLGN_CD	F0500H Interview for Activity Preferences: Religion Code		*
203	F0600_RSPNDT_ACTVTY_CD	F0600 Daily and Activity Preferences Primary Respondent Code		*
204	F0700_STF_CNDCT_ACTVTY_CD	F0700 Conduct Staff Assessment of Daily and Activity Preferences Code		*
205	F0800A_STF_DRESS_CD	F0800A Staff Assessment: Chooses Clothes Code		
206	F0800B_STF_CARE_PRSNL_ITM_CD	F0800B Staff Assessment: Care Personal Item Code		*
207	F0800C_STF_TUB_BATH_CD	F0800C Staff Assessment: Tub Bath Code		*
208	F0800D_STF_SHWR_CD	F0800D Staff Assessment: Shower Code		*
209	F0800E_STF_BED_BATH_CD	F0800E Staff Assessment: Bed Bath Code		*
210	F0800F_STF_SPNG_BATH_CD	F0800F Staff Assessment: Sponge Bath Code		*
211	F0800G_STF_SNACK_BTWN_CD	F0800G Staff Assessment: Snacks Between Code		*
212	F0800H_STF_BED_TIME_CD	F0800H Staff Assessment: Bed Time Code		*
213	F0800I_STF_FMLY_INVLVMT_CD	F0800I Staff Assessment: Family Involvement Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
214	F0800J_STF_PRVT_PHNE_CD	F0800J Staff Assessment: Private Phone Code		*
215	F0800K_STF_LOCK_ITM_CD	F0800K Staff Assessment: Lock Item Code		*
216	F0800L_STF_READG_AVLBL_CD	F0800L Staff Assessment: Reading Materials Available Code		*
217	F0800M_STF_MUSIC_CD	F0800M Staff Assessment: Music Code		*
218	F0800N_STF_ANML_CD	F0800N Staff Assessment: Animal Presence Code		*
219	F0800O_STF_NEWS_CD	F0800O Staff Assessment: News Code		*
220	F0800P_STF_GRP_ACTVTY_CD	F0800P Staff Assessment: Group Activity Code		*
221	F0800Q_STF_FVRT_ACTVTY_CD	F0800Q Staff Assessment: Favorite Activity Code		*
222	F0800R_STF_TIME_AWAY_NH_CD	F0800R Staff Assessment: Time Away Nursing Home Code		*
223	F0800S_STF_FRSH_AIR_CD	F0800S Staff Assessment: Time Outdoors Code		*
224	F0800T_STF_RLGN_CD	F0800T Staff Assessment: Participating in Religious Activities Code		*
225	F0800Z_STF_NO_ACTVTY_CD	F0800Z Staff Assessment: None of Above Activity Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
226	G0110F2_LOCOMTN_OFF_SPRT_CD	G0100F2 ADL Assistance: Locomotion Off Support Provided Code		*
227	G0110A1_BED_MBLTY_SELF_CD	G0110A1 ADL Assistance: Bed Mobility Self Performance Code		*
228	G0110A2_BED_MBLTY_SPRT_CD	G0110A2 ADL Assistance: Bed Mobility Support Provided Code		*
229	G0110B1_TRNSFR_SELF_CD	G0110B1 ADL Assistance: Transfer Self Performance Code		*
230	G0110B2_TRNSFR_SPRT_CD	G0110B2 ADL Assistance: Transfer Self Support Provided Code		*
231	G0110C1_WLK_ROOM_SELF_CD	G0110C1 ADL Assistance: Walk In Room Self Performance Code		*
232	G0110C2_WLK_ROOM_SPRT_CD	G0110C2 ADL Assistance: Walk In Room Support Provided Code		*
233	G0110D1_WLK_CRDR_SELF_CD	G0110D1 ADL Assistance: Walk In Corridor Self Performance Code		*
234	G0110D2_WLK_CRDR_SPRT_CD	G0110D2 ADL Assistance: Walk In Corridor Self Support Provided Code		*
235	G0110E1_LOCOMTN_ON_SELF_CD	G0110E1 ADL Assistance: Locomotion On Self Performance Code		*
236	G0110E2_LOCOMTN_ON_SPRT_CD	G0110E2 ADL Assistance: Locomotion On Support Provided Code		*
237	G0110F1_LOCOMTN_OFF_SELF_CD	G0110F1 ADL Assistance: Locomotion Off Self Performance Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
238	G0110G1_DRESS_SELF_CD	G0110G1 ADL Assistance: Dress Self Performance Code		*
239	G0110G2_DRESS_SPRT_CD	G0110G2 ADL Assistance: Dress Support Provided Code		*
240	G0110H1_EATG_SELF_CD	G0110H1 ADL Assistance: Eating Self Performance Code		*
241	G0110H2_EATG_SPRT_CD	G0110H2 ADL Assistance: Eating Support Provided Code		*
242	G0110I1_TOILTG_SELF_CD	G0110I1 ADL Assistance: Toileting Self Performance Code		*
243	G0110I2_TOILTG_SPRT_CD	G0110I2 ADL Assistance: Toileting Support Provided Code		*
244	G0110J1_PRSNL_HYGNE_SELF_CD	G0110J1 ADL Assistance: Personal Hygiene Self Performance Code		*
245	G0110J2_PRSNL_HYGNE_SPRT_CD	G0110J2 ADL Assistance: Personal Hygiene Support Provided Code		*
246	G0120A_BATHG_SELF_CD	G0120A ADL Assistance: Bathing Self Performance Code		*
247	G0120B_BATHG_SPRT_CD	G0120B ADL Assistance: Bathing Support Provided Code		*
248	G0300A_BAL_SEAT_STNDG_CD	G0300A Balance During Seated to Standing Position Code		*
249	G0300B_BAL_WLKG_CD	G0300B Balance During Walking Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
250	G0300C_BAL_TRNG_ARND_CD	G0300C Balance When Turning Around Code		*
251	G0300D_BAL_TOILT_CD	G0300D Balance Moving On and Off Toilet Code		*
252	G0300E_BAL_SRFC_TRNSFR_CD	G0300E Balance With Surface to Surface Transfer Code		*
253	G0400A_UPR_XTRMTY_MTN_CD	G0400A Functional Limitation in ROM: Upper Extremity Motion Code		*
254	G0400B_LWR_XTRMTY_MTN_CD	G0400B Functional Limitation in ROM: Lower Extremity Motion Code		*
255	G0600A_CANE_CD	G0600A Mobility Devices: Cane Code		*
256	G0600B_WLKR_CD	G0600B Mobility Devices: Walker Code		*
257	G0600C_WHLCHR_CD	G0600C Mobility Devices: Wheelchair Code		*
258	G0600D_LIMB_PRSTHTC_CD	G0600D Mobility Devices: Limb Prosthesis Code		*
259	G0600Z_NO_MBLTY_CD	G0600Z Mobility Devices: None of Above Code		*
260	G0900A_INCRS_INDPNDNC_CD	G0900A Functional Rehabilitation Potential: Resident Increased Independence Code		*
261	G0900B_STF_INCRS_INDPNDNC_CD	G0900B Functional Rehabilitation Potential: Staff Increased Independence Code		*

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
262	H0100A_INDWLG_CTHTR_CD	H0100A Bladder and Bowel Appliances: Indwelling Catheter Code		
263	H0100B_EXTRNL_CTHTR_CD	H0100B Bladder and Bowel Appliances: External Catheter Code		
264	H0100C_OSTMY_CD	H0100C Bladder and Bowel Appliances: Ostomy Code		
265	H0100D_INTRMTNT_CTHTR_CD	H0100D Bladder and Bowel Appliances: Intermittent Catheter Code		
266	H0100Z_NO_URNRY_APLNC_CD	H0100Z Bladder and Bowel Appliances: No Urinary Appliance Code		
267	H0200A_TRIL_TOILTG_PGM_CD	H0200A Urinary Toileting Program: Trial Toileting Program Code		
268	H0200B_RSPNS_TOILTG_PGM_CD	H0200B Urinary Toileting Program: Response To Toileting Program Code		
269	H0200C_CRNT_TOILTG_PGM_CD	H0200C Urinary Toileting Program: Current Toileting Program Code		
270	H0300_URNRY_CNTNC_CD	H0300 Urinary Continence Code		
271	H0400_BWL_CNTNC_CD	H0400 Bowel Continence Code		
272	H0500_BWL_TOILTG_PGM_CD	H0500 Bowel Toileting Program Code		
273	H0600_CONSTPTN_CD	H0600 Constipation Code		
274	I0100_CNCR_CD	I0100 Active Diagnoses: Cancer Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
275	I0200_ANEMIA_CD	I0200 Active Diagnoses: Anemia Code		
276	I0300_DYSRHYTHMIA_CD	I0300 Active Diagnoses: Dysrhythmia Code		
277	I0400_CAD_CD	I0400 Active Diagnoses: Coronary Artery Disease (CAD) Code		
278	I0500_DVT_CD	I0500 Active Diagnoses: Deep Vein Thrombosis (DVT) Code		
279	I0600_HRT_FAILR_CD	I0600 Active Diagnoses: Heart Failure (CHF) Code		
280	I0700_HYPRTNSN_CD	I0700 Active Diagnoses: Hypertension Code		
281	I0800_HYPOTNSN_CD	I0800 Active Diagnoses: Hypotension Code		
282	I0900_PVD_CD	I0900 Active Diagnoses: Peripheral Vascular Disease (PVD) Code		
283	I1100_CRRHS_CD	I1100 Active Diagnoses: Cirrhosis Code		
284	I1200_GERD_CD	I1200 Active Diagnoses: Gastroesophageal Reflux Disease (GERD) Code		
285	I1300_ULCRTV_CLTS_CD	I1300 Active Diagnoses: Ulcerative Colitis Code		
286	I1400_BPH_CD	I1400 Active Diagnoses: Benign Prostatic Hyperplasia (BPH) Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
287	I1500_ESRD_CD	I1500 Active Diagnoses: End Stage Renal Disease (ESRD) Code		
288	I1550_NRGNC_BLADR_CD	I1550 Active Diagnoses: Neurogenic Bladder Code		
289	I1650_OBSTRCT_URPTHY_CD	I1650 Active Diagnoses: Obstructive Uropathy Code		
290	I1700_MDRO_CD	I1700 Active Diagnoses: Multi-drug Resistant Drug Organism (MDRO) Code		
291	I2000_PNEUMO_CD	I2000 Active Diagnoses: Pneumonia Code		
292	I2100_SPTCMIA_CD	I2100 Active Diagnoses: Septicemia Code		
293	I2200_TB_CD	I2200 Active Diagnoses: Tuberculosis Code		
294	I2300_UTI_CD	I2300 Active Diagnoses: Urinary Tract Infection (UTI) Code		
295	I2400_VRL_HPT_CD	I2400 Active Diagnoses: Viral Hepatitis Code		
296	I2500_WND_INFCTN_CD	I2500 Wound Infection Code		
297	I2900_DM_CD	I2900 Active Diagnoses: Diabetes Mellitus (DM) Code		
298	I3100_HYPONATREMIA_CD	I3100 Active Diagnoses: Hyponatremia Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
299	I3200_HYPERKALEMIA_CD	I3200 Active Diagnoses: Hyperkalemia Code		
300	I3300_HYPERLIPIDMIA_CD	I3300 Active Diagnoses: Hyperlipidemia Code		
301	I3400_THYRD_CD	I3400 Active Diagnoses: Thyroid Code		
302	I3700_ARTHTS_CD	I3700 Active Diagnoses: Arthritis Code		
303	I3800_OSTPRS_CD	I3800 Active Diagnoses: Osteoporosis Code		
304	I3900_HIP_FRCTR_CD	I3900 Active Diagnoses: Hip Fracture Code		
305	I4000_OTHR_FRCTR_CD	I4000 Active Diagnoses: Other Fracture Code		
306	I4200_ALZHMR_CD	I4200 Active Diagnoses: Alzheimers Disease Code		
307	I4300_APHASIA_CD	I4300 Active Diagnoses: Aphasia Code		
308	I4400_CRBRL_PLSY_CD	I4400 Active Diagnoses: Cerebral Palsy Code		
309	I4500_STRK_CD	I4500 Active Diagnoses: Stroke (CVA or TIA or Stroke) Code		
310	I4800_DMNT_CD	I4800 Active Diagnoses: Dementia Code		
311	I4900_HEMIPLG_CD	I4900 Active Diagnoses: Hemiplegia Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
312	I5000_PARAPLG_CD	I5000 Active Diagnoses: Paraplegia Code		
313	I5100_QUADPLG_CD	I5100 Active Diagnoses: Quadriplegia Code		
314	I5200_MS_CD	I5200 Active Diagnoses: Multiple Sclerosis Code		
315	I5250_HNTGTN_CD	I5250 Active Diagnoses: Huntingtons Code		
316	I5300_PRKNSN_CD	I5300 Active Diagnoses: Parkinsons Code		
317	I5350_TOURT_CD	I5350 Tourettes Code		
318	I5400_SZRE_CD	I5400 Active Diagnoses: Seizure Code		
319	I5500_BRN_INJURY_CD	I5500 Active Diagnoses: Traumatic Brain Injury (TBI) Code		
320	I5600_MALNTRTN_CD	I5600 Active Diagnoses: Malnutrition Code		
321	I5700_ANXTY_DSORDR_CD	I5700 Active Diagnoses: Anxiety Disorder Code		
322	I5800_DPRSN_CD	I5800 Active Diagnoses: Depression Code		
323	I5900_MNC_DPRSN_CD	I5900 Active Diagnoses: Manic Depression Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
324	I5950_PSYCHTC_CD	I5950 Active Diagnoses: Psychotic Code		
325	I6000_SCHZOPRNIA_CD	I6000 Active Diagnoses: Schizophrenia Code		
326	I6100_PTSD_CD	I6100 Active Diagnoses: Post-traumatic Stress Disorder (PTSD) Code		
327	I6200_ASTHMA_CD	I6200 Active Diagnoses: Asthma COPD Chronic Lung Disease Code		
328	I6300_RSPRTRY_FAILR_CD	I6300 Active Diagnoses: Respiratory Failure Code		
329	I6500_CTRCT_CD	I6500 Active Diagnoses: Cataracts Glaucoma or Macular Degeneration Code		
330	I7900_NO_ACTV_DEASE_CD	I7900 Active Diagnoses: No Active Disease Code		
331	I8000A_ICD_1_CD	I8000A Additional Active Diagnoses: ICD 1 Code		
332	I8000B_ICD_2_CD	I8000B Additional Active Diagnoses: ICD 2 Code		
333	I8000C_ICD_3_CD	I8000C Additional Active Diagnoses: ICD 3 Code		
334	I8000D_ICD_4_CD	I8000D Additional Active Diagnoses: ICD 4 Code		
335	I8000E_ICD_5_CD	I8000E Additional Active Diagnoses: ICD 5 Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
336	I8000F_ICD_6_CD	I8000F Additional Active Diagnoses: ICD 6 Code		
337	I8000G_ICD_7_CD	I8000G Additional Active Diagnoses: ICD 7 Code		
338	I8000H_ICD_8_CD	I8000H Additional Active Diagnoses: ICD 8 Code		
339	I8000I_ICD_9_CD	I8000I Additional Active Diagnoses: ICD 9 Code		
340	I8000J_ICD_10_CD	I8000J Additional Active Diagnoses: ICD 10 Code		
341	J0100A_SCHLD_PAIN_MDCTN_CD	J0100A Pain management: Scheduled Pain Medication Code		
342	J0100B_PRN_PAIN_MDCTN_CD	J0100B Pain management: PRN Pain Medication Code		
343	J0100C_OTHR_PAIN_INTRVTN_CD	J0100C Pain management: Other Pain Intervention Code		
344	J0200_CNDCT_PAIN_ASMT_CD	J0200 Should Pain Assessment be Conducted Code		
345	J0300_PAIN_CD	J0300 Pain Assessment Interview: Pain Presence Code		
346	J0400_PAIN_FREQ_CD	J0400 Pain Assessment Interview: Pain Frequency Code		
347	J0500A_PAIN_EFCT_SLEEP_CD	J0500A Pain Assessment Interview: Pain Effect Sleep Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
348	J0500B_PAIN_EFCT_ACTVTY_CD	J0500B Pain Assessment Interview: Pain Effect Activity Code		
349	J0600A_PAIN_INTNSTY_NUM	J0600A Pain Intensity Numeric Rating Scale Number		
350	J0600B_VRBL_DSCRPTR_SCALE_NUM	J0600B Pain Intensity Verbal Descriptor Scale Number		
351	J0700_STF_CNDCT_PAIN_ASMT_CD	J0700 Staff Conduct Pain Assessment Code		
352	J0800A_NVRBL_SND_CD	J0800A Staff Assessment for Pain: Nonverbal Sound Code		
353	J0800B_VCL_CMPLNT_CD	J0800B Staff Assessment for Pain: Vocal Complaint Code		
354	J0800C_FACE_EXPRSN_CD	J0800C Staff Assessment for Pain: Facial Expression Code		
355	J0800D_PRTCTV_MVMT_CD	J0800D Staff Assessment for Pain: Protective Movement Code		
356	J0800Z_NO_SGN_PAIN_CD	J0800Z Staff Assessment for Pain: None of Above Signs of Pain Code		
357	J0850_STF_PAIN_FREQ_CD	J0850 Staff Frequency of Indicator of Pain or Possible Pain Frequency Code		
358	J1100A_SOB_EXRTN_CD	J1100A Shortness of Breath With Exertion Code		
359	J1100B_SOB_SITG_CD	J1100B Shortness of Breath When Sitting Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
360	J1100C_SOB_LYG_CD	J1100C Shortness of Breath When Lying Flat Code		
361	J1100Z_NO_SOB_CD	J1100Z None of Above Shortness of Breath Code		
362	J1300_TOBCO_CD	J1300 Tobacco Use Code		
363	J1400_LIFE_PRGNS_CD	J1400 Life Prognosis Less Than Six Months Code		
364	J1550A_FVR_CD	J1550A Problem Conditions: Fever Code		
365	J1550B_VMTG_CD	J1550B Problem Conditions: Vomiting Code		
366	J1550C_DHYDRT_CD	J1550C Problem Conditions: Dehydration Code		
367	J1550D_INTRNL_BLEDG_CD	J1550D Problem Conditions: Internal Bleeding Code		
368	J1550Z_NO_PRBLM_COND_CD	J1550Z Problem Conditions: None of Above Code		
369	J1700A_FALL_30_DAY_CD	J1700A Fall History on Admission: Fall 30 Day Code		
370	J1700B_FALL_31_180_DAY_CD	J1700B Fall History on Admission: Fall 31-180 Day Code		
371	J1700C_FRCTR_SIX_MO_CD	J1700C Fall History on Admission: Fall Six Month Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
372	J1800_FALL_LAST_ASMT_CD	J1800 Falls Since Admission or Prior Assessment Code		
373	J1900A_FALL_NO_INJURY_CD	J1900A Number of Falls Since Admission or Prior Assessment With No Injury Code		
374	J1900B_FALL_INJURY_CD	J1900B Number of Falls Since Admission or Prior Assessment With Injury Except Major Code		
375	J1900C_FALL_MAJ_INJURY_CD	J1900C Number of Falls Since Admission or Prior Assessment With Major Injury Code		
376	K0100A_LOSS_MOUTH_EATG_CD	K0100A Swallowing Disorder: Loss Mouth Eating Code		
377	K0100B_HLD_FOOD_MOUTH_CD	K0100B Swallowing Disorder: Hold Food Mouth Code		
378	K0100C_CHOK_DRNG_MEAL_CD	K0100C Swallowing Disorder: Choke Drinking Meal Code		
379	K0100D_CMPLNT_SWLWG_CD	K0100D Swallowing Disorder: Complaint Swallowing Code		
380	K0100Z_NO_SWLWG_CD	K0100Z Swallowing Disorder: None of Above Code		
381	K0200A_HGT_NUM	K0200A Height Number		
382	K0200B_WT_NUM	K0200B Weight Number		
383	K0300_WT_LOSS_CD	K0300 Weight Loss Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
384	K0500A_PEN_CD	K0500A Nutritional Approaches: Parenteral/IV Feeding Code		
385	K0500B_FEEDG_TUBE_CD	K0500B Nutritional Approaches: Feeding Tube Code		
386	K0500C_ALTR_FOOD_CD	K0500C Nutritional Approaches: Mechanically Altered Diet Code		
387	K0500D_THRPTC_DIET_CD	K0500D Nutritional Approaches: Therapeutic Diet Code		
388	K0500Z_NO_FEEDG_CD	K0500Z Nutritional Approaches: None of Above Code		
389	K0700A_CAL_PEN_CD	K0700A Percent Caloric Intake Through Parenteral/Tube Feeding Code		
390	K0700B_IV_TUBE_DAILY_CD	K0700B Average Fluid Intake by IV Or Tube Feeding Code		
391	L0200A_BRKN_DNTR_CD	L0200A Dental Status: Broken Denture Code		
392	L0200B_NO_TEETH_CD	L0200B Dental Status: No Teeth Code		
393	L0200C_ABNRML_MOUTH_TISUE_CD	L0200C Dental Status: Abnormal Mouth Tissue Code		
394	L0200D_CVTY_CD	L0200D Dental Status: Cavity Code		
395	L0200E_INFLMD_GUM_CD	L0200E Dental Status: Inflamed Gum Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
396	L0200F_MOUTH_PAIN_CD	L0200F Dental Status: Mouth or Facial Pain Code		
397	L0200G_DNTL_UNK_CD	L0200G Dental Status: Unable to Examine Code		
398	L0200Z_NO_DNTL_CD	L0200Z Dental Status: None of Above Code		
399	M0100A_RISK_VSBL_CD	M0100A Determination of Pressure Ulcer Risk: Ulcer Visible Code		
400	M0100B_RISK_FRML_ASMT_CD	M0100B Determination of Pressure Ulcer Risk: Formal Assessment/Instrument Code		
401	M0100C_RISK_CLNCL_JDGMNT_CD	M0100C Determination of Pressure Ulcer Risk: Clinical Assessment Code		
402	M0100Z_NO_RISK_DTMNTN_CD	M0100Z Determination of Pressure Ulcer Risk: None of Above		
403	M0150_PRSR_ULCR_RISK_CD	M0150 Pressure Ulcer Risk Code		
404	M0210_STG_1_HGHR_ULCR_CD	M0210 One or More Stage 1 or Higher Unhealed Pressure Ulcer Code		
405	M0300A_STG_1_ULCR_NUM	M0300A Stage 1 Pressure Ulcer Number		
406	M0300B1_STG_2_ULCR_NUM	M0300B1 Stage 2 Pressure Ulcer Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
407	M0300B2_STG_2_ULCR_ADMSN_NUM	M0300B2 Stage 2 Pressure Ulcer Present on Admission Number		
408	M0300B3_STG_2_ULCR_OLD_DT	M0300B3 Date of Oldest Stage 2 Pressure Ulcer		
409	M0300C1_STG_3_ULCR_NUM	M0300C1 Stage 3 Pressure Ulcer Number		
410	M0300C2_STG_3_ULCR_ADMSN_NUM	M0300C2 Stage 3 Pressure Ulcer Present on Admission Number		
411	M0300D1_STG_4_ULCR_NUM	M0300D1 Stage 4 Pressure Ulcer Number		
412	M0300D2_STG_4_ULCR_ADMSN_NUM	M0300D2 Stage 4 Pressure Ulcer Present on Admission Number		
413	M0300E1_UNSTGBL_ULCR_DRSNG_NUM	M0300E1 Unstageable Pressure Ulcer Due To Dressing Number		
414	M0300E2_U_ULCR_DRSNG_ADMSN_NUM	M0300E2 Unstageable Pressure Ulcer Due To Dressing on Admission Number		
415	M0300F1_UNSTGBL_ULCR_ESC_NUM	M0300F1 Unstageable Pressure Ulcer With Slough or Eschar Number		
416	M0300F2_U_ULCR_ESC_ADMSN_NUM	M0300F2 Unstageable Pressure Ulcer With Slough or Eschar on Admission Number		
417	M0300G1_UNSTGBL_ULCR_DEEP_NUM	M0300G1 Unstageable Pressure Ulcer With Deep Tissue Injury Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
418	M0300G2_U_ULCR_DEEP_ADMSN_NUM	M0300G2 Unstageable Pressure Ulcer With Deep Tissue Injury on Admission Number		
419	M0610A_STG_3_4_ULCR_LNGTH_NUM	M0610A Unhealed Stage 3-4 Pressure Ulcer Length Number		
420	M0610B_STG_3_4_ULCR_WDTH_NUM	M0610B Unhealed Stage 3-4 Pressure Ulcer Width Number		
421	M0610C_STG_3_4_ULCR_DPTH_NUM	M0610C Unhealed Stage 3-4 Pressure Ulcer Depth Number		
422	M0700_ULCR_TISUE_TYPE_CD	M0700 Most Severe Pressure Ulcer Tissue Type Code		
423	M0800A_WRSNG_STG_2_ULCR_NUM	M0800A Worsening Stage 2 Pressure Ulcer Since Prior Assessment Number		
424	M0800B_WRSNG_STG_3_ULCR_NUM	M0800B Worsening Stage 3 Pressure Ulcer Since Prior Assessment Number		
425	M0800C_WRSNG_STG_4_ULCR_NUM	M0800C Worsening Stage 4 Pressure Ulcer Since Prior Assessment Number		
426	M0900A_PRSR_ULCR_PRIOR_CD	M0900A Healed Pressure Ulcer Present on Prior Assessment Code		
427	M0900B_HEALD_STG_2_ULCR_NUM	M0900B Healed Stage 2 Pressure Ulcer Number		
428	M0900C_HEALD_STG_3_ULCR_NUM	M0900C Healed Stage 3 Pressure Ulcer Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
429	M0900D_HEALD_STG_4_ULCR_NUM	M0900D Healed Stage 4 Pressure Ulcer Number		
430	M1030_ARTRL_ULCR_NUM	M1030 Venous and Arterial Ulcer Number		
431	M1040A_FT_INFCTN_CD	M1040A Other Foot Skin Problems: Foot Infection Code		
432	M1040B_DBTC_FT_ULCR_CD	M1040B Other Foot Skin Problems: Diabetic Foot Ulcer Code		
433	M1040C_OTHR_LSN_FT_CD	M1040C Other Foot Skin Problems: Other Open Lesion on Foot Code		
434	M1040D_OPEN_LSN_CD	M1040D Other Skin Problems: Open Lesions Other Than Ulcers Rashes Cuts Code		
435	M1040E_SRGCL_WND_CD	M1040E Other Skin Problems: Surgical Wound(s) Code		
436	M1040F_BRN_CD	M1040F Other Skin Problems: Burn(s) Code		
437	M1040Z_NO_OTHR_SKIN_PRBLM_CD	M1040Z Other Skin Problems: None of Above Code		
438	M1200A_PRSR_RDC_CHR_CD	M1200A Skin and Ulcer Treatments: Pressure Reducing Device in Chair Code		
439	M1200B_PRSR_RDC_BED_CD	M1200B Skin and Ulcer Treatments: Pressure Reducing Device in Bed Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
440	M1200C_TRNG_PGM_CD	M1200C Skin and Ulcer Treatments: Turning/Repositioning Program Code		
441	M1200D_HYDRTN_CD	M1200D Skin and Ulcer Treatments: Nutrition/Hydration Code		
442	M1200E_ULCR_CARE_CD	M1200E Skin and Ulcer Treatments: Ulcer Care Code		
443	M1200F_SRGCL_WND_CARE_CD	M1200F Skin and Ulcer Treatments: Surgical Wound Care Code		
444	M1200G_APLCTN_DRSNG_CD	M1200G Skin and Ulcer Treatments: Application Nonsurgical Dressing Code		
445	M1200H_APLCTN_ONTMNT_CD	M1200H Skin and Ulcer Treatments: Application Ointments/Medications Code		
446	M1200I_APLCTN_DRSNG_FOOT_CD	M1200I Skin and Ulcer Treatments: Application Dressings to Foot Code		
447	M1200Z_NO_SKIN_TRMNT_CD	M1200Z Skin and Ulcer Treatments: None of Above Code		
448	N0300_INJCT_MDCTN_DAY_NUM	N0300 Number of Days Injections of Any Type		
449	N0350A_INSLN_INJCT_DAY_NUM	N0350A Number of Days Insulin Injections		
450	N0350B_INSLN_ORDR_DAY_NUM	N0350B Number of Days Insulin Orders Changed		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
451	N0400A_ANTIPSYCHTC_CD	N0400A Medications Received: Antipsychotic Code		
452	N0400B_ANTINXTY_CD	N0400B Medications Received: Antianxiety Code		
453	N0400C_ANTIDPRSNT_CD	N0400C Medications Received: Antidepressant Code		
454	N0400D_HPNTC_CD	N0400D Medications Received: Hypnotic Code		
455	N0400E_ANTICOAGLNT_CD	N0400E Medications Received: Anticoagulant Code		
456	N0400F_ANTBTC_CD	N0400F Medications Received: Antibiotic Code		
457	N0400G_DRTC_CD	N0400G Medications Received: Diuretic Code		
458	N0400Z_NO_MDCTN_RCVD_CD	N0400Z Medications Received: None of Above		
459	O0100A1_CHMTHRPY_PRIOR_CD	O0100A1 Special Treatments/Programs: Chemotherapy Pre-admit Code		
460	O0100A2_CHMTHRPY_POST_CD	O0100A2 Special Treatments/Programs: Chemotherapy Post-admit Code		
461	O0100B1_RDTN_PRIOR_CD	O0100B1 Special Treatments/Programs: Radiation Pre-admit Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
462	O0100B2_RDTN_POST_CD	O0100B2 Special Treatments/Programs: Radiation Post-admit Code		
463	O0100C1_OXGN_PRIOR_CD	O0100C1 Special Treatments/Programs: Oxygen Pre-admit Code		
464	O0100C2_OXGN_POST_CD	O0100C2 Special Treatments/Programs: Oxygen Post-admit Code		
465	O0100D1_SCTNG_PRIOR_CD	O0100D1 Special Treatments/Programs: Suctioning Pre-admit Code		
466	O0100D2_SCTNG_POST_CD	O0100D2 Special Treatments/Programs: Suctioning Post-admit Code		
467	O0100E1_TRCHOSTMY_PRIOR_CD	O0100E1 Special Treatments/Programs: Tracheostomy Pre-admit Code		
468	O0100E2_TRCHOSTMY_POST_CD	O0100E2 Special Treatments/Programs: Tracheostomy Post-admit Code		
469	O0100F1_VNTLTR_PRIOR_CD	O0100F1 Special Treatments/Programs: Ventilator Pre-admit Code		
470	O0100F2_VNTLTR_POST_CD	O0100F2 Special Treatments/Programs: Ventilator Post-admit Code		
471	O0100G1_CPAP_PRIOR_CD	O0100G1 Special Treatments/Programs: Continuous		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
		Positive Airway Pressure Pre-admit Code		
472	O0100G2_CPAP_POST_CD	O0100G2 Special Treatments/Programs: Continuous Positive Airway Pressure Post-admit Code		
473	O0100H1_IV_MDCTN_PRIOR_CD	O0100H1 Special Treatments/Programs: Intravenous Medication Pre-admit Code		
474	O0100H2_IV_MDCTN_POST_CD	O0100H2 Special Treatments/Programs: Intravenous Medication Post-admit Code		
475	O0100I1_TRNSFSN_PRIOR_CD	O0100I1 Special Treatments/Programs: Transfusion Pre-admit Code		
476	O0100I2_TRNSFSN_POST_CD	O0100I2 Special Treatments/Programs: Transfusion Post-admit Code		
477	O0100J1_DLYS_PRIOR_CD	O0100J1 Special Treatments/Programs: Dialysis Pre-admit Code		
478	O0100J2_DLYS_POST_CD	O0100J2 Special Treatments/Programs: Dialysis Post-admit Code		
479	O0100K1_HOSPC_PRIOR_CD	O0100K1 Special Treatments/Programs: Hospice Pre-admit Code		
480	O0100K2_HOSPC_POST_CD	O0100K2 Special Treatments/Programs: Hospice Post-admit Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
481	O0100L2_RESP_POST_CD	O0100L2 Special Treatments/Programs: Respite Post-admit Code		
482	O0100M1_ISLTN_PRIOR_CD	O0100M1 Special Treatments/Programs: Isolation Pre-admit Code		
483	O0100M2_ISLTN_POST_CD	O0100M2 Special Treatments/Programs: Isolation Post-admit Code		
484	O0100Z1_NO_TRTMT_PRIOR_CD	O0100Z1 Special Treatments/Programs: None of Above Pre-admit Treatment Prior Code		
485	O0100Z2_NO_TRTMT_POST_CD	O0100Z2 Special Treatments/Programs: None of Above Treatment Post-admit Code		
486	O0250A_INFLNZ_RCVD_CD	O0250A Influenza Received Code		
487	O0250B_INFLNZ_RCVD_DT	O0250B Influenza Received Date		
488	O0250C_RSN_INFLNZ_NOT_RCV_CD	O0250C Reason Influenza Not Received Code		
489	O0300A_PPV_CD	O0300A Pneumococcal Vaccination Code		
490	O0300B_RSN_PPV_NOT_RCVD_CD	O0300B Reason Pneumococcal Vaccination Not Received Code		
491	O0400A1_SPCH_THRPY_IND_MIN_NUM	O0400A1 Speech Therapy/Audiology Individual Minutes Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
492	O0400A2_SPCH_THRPY_CNC_MIN_NUM	O0400A2 Speech Therapy/Audiology Concurrent Minutes Number		
493	O0400A3_SPCH_THRPY_GRP_MIN_NUM	O0400A3 Speech Therapy/Audiology Group Minutes Number		
494	O0400A4_SPCH_THRPY_DAY_NUM	O0400A4 Number of Days Speech Therapy/Audiology Administered		
495	O0400A5_SPCH_THRPY_STRT_DT	O0400A5 Speech Therapy/Audiology Start Date		
496	O0400A6_SPCH_THRPY_END_DT	O0400A6 Speech Therapy/Audiology End Date		
497	O0400B1_OT_INDVDL_MIN_NUM	O0400B1 Occupational Therapy Individual Minutes Number		
498	O0400B2_OT_CNCRNT_MIN_NUM	O0400B2 Occupational Therapy Concurrent Minutes Number		
499	O0400B3_OT_GRP_MIN_NUM	O0400B3 Occupational Therapy Group Minutes Number		
500	O0400B4_OT_DAY_NUM	O0400B4 Number of Days Occupational Therapy Administered		
501	O0400B5_OT_STRT_DT	O0400B5 Occupational Therapy Start Date		
502	O0400B6_OT_END_DT	O0400B6 Occupational Therapy End Date		
503	O0400C1_PT_INDVDL_MIN_NUM	O0400C1 Physical Therapy Individual Minutes Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
504	O0400C2_PT_CNCRNT_MIN_NUM	O0400C2 Physical Therapy Concurrent Minutes Number		
505	O0400C3_PT_GRP_MIN_NUM	O0400C3 Physical Therapy Group Minutes Number		
506	O0400C4_PT_DAY_NUM	O0400C4 Number of Days Physical Therapy Administered		
507	O0400C5_PT_STRT_DT	O0400C5 Physical Therapy Start Date		
508	O0400C6_PT_END_DT	O0400C6 Physical Therapy End Date		
509	O0400D1_RT_MIN_NUM	O0400D1 Respiratory Therapy Minutes Number		
510	O0400D2_RT_DAY_NUM	O0400D2 Number of Days Respiratory Therapy Administered		
511	O0400E1_PSYCH_THRPY_MIN_NUM	O0400E1 Psychological Therapy Minutes Number		
512	O0400E2_PSYCH_THRPY_DAY_NUM	O0400E2 Number of Days Psychological Therapy Administered		
513	O0400F1_RCRTNL_THRPY_MIN_NUM	O0400F1 Recreational Therapy Minutes Number		
514	O0400F2_RCRTNL_THRPY_DAY_NUM	O0400F2 Number of Days Recreational Therapy Administered		
515	O0500A_PSV_ROM_NUM	O0500A Restorative Nursing: Passive Range of Motion Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
516	O0500B_ACTV_ROM_NUM	O0500B Restorative Nursing: Active Range of Motion Number		
517	O0500C_BRC_ASTNC_NUM	O0500C Restorative Nursing: Splint/Brace Assistance Number		
518	O0500D_BED_MBLTY_TRNG_NUM	O0500D Restorative Nursing: Bed Mobility Training Number		
519	O0500E_TRNSFR_TRNG_NUM	O0500E Restorative Nursing: Transfer Training Number		
520	O0500F_WLKG_TRNG_NUM	O0500F Restorative Nursing: Walking Training Number		
521	O0500G_DRSG_TRNG_NUM	O0500G Restorative Nursing: Dressing/Grooming Training Number		
522	O0500H_EATG_TRNG_NUM	O0500H Restorative Nursing: Eating/Swallowing Training Number		
523	O0500I_AMPUTTN_TRNG_NUM	O0500I Restorative Nursing: Amputation/Prosthesis Care Training Number		
524	O0500J_COMMUN_TRNG_NUM	O0500J Restorative Nursing: Communication Training Number		
525	O0600_PHYSN_EXMN_NUM	O0600 Physician Examination Day Number		
526	O0700_PHYSN_ORDR_NUM	O0700 Physician Order Day Number		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
527	P0100A_BED_RAIL_CD	P0100A Physical Restraints in Bed: Bed Rail Code		
528	P0100B_TRNK_RSTRNT_BED_CD	P0100B Physical Restraints in Bed: Trunk Restraint Bed Code		
529	P0100C_LMB_RSTRNT_BED_CD	P0100C Physical Restraints in Bed: Limb Restraint Bed Code		
530	P0100D_OTHR_RSTRNT_BED_CD	P0100D Physical Restraints in Bed: Other Restraint Bed Code		
531	P0100E_TRNK_RSTRNT_CHR_CD	P0100E Physical Restraints in Chair: Trunk Restraint Chair Code		
532	P0100F_LMB_RSTRNT_CHR_CD	P0100F Physical Restraints in Chair: Limb Restraint Chair Code		
533	P0100G_CHR_PRVNT_RISE_CD	P0100G Physical Restraints in Chair: Chair Prevent Rise Code		
534	P0100H_OTHR_RSTRNT_CHR_CD	P0100H Physical Restraints in Chair: Other Restraint Chair Code		
535	Q0100A_RSDNT_PRTCPTN_CD	Q0100A Resident Participation in Assessment Code		
536	Q0100B_FMLY_PRTCPTN_CD	Q0100B Family Participation in Assessment Code		
537	Q0100C_GRDN_PRTCPTN_CD	Q0100C Guardian Participation in Assessment Code		
538	Q0300A_RSDNT_GOAL_CD	Q0300A Resident Overall Goal Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
539	Q0300B_GOAL_SRC_CD	Q0300B Overall Goal Source Code		
540	Q0400A_DSCHRG_PLN_CD	Q0400A Discharge Plan Code		
541	Q0400B_DSCHRG_DTRMNTN_CD	Q0400B Discharge Determination Code		
542	Q0500A_RSDNT_RTRN_CMNTY_CD	Q0500A Has Resident Been Asked About Return To Community Code		
543	Q0500B_STF_ASK_RTRN_CMNTY_CD	Q0500B Staff Asked Resident or Family About Return To Community Code		
544	Q0600_LCA_RFRL_CD	Q0600 Local Contact Agency Referral Code		
545	V0100A_PRIOR_FED_OBRA_CD	V0100A Prior Assessment Federal OBRA Reason for Assessment Code		
546	V0100B_PRIOR_PPS_CD	V0100B Prior Assessment PPS Reason for Assessment Code		
547	V0100C_PRIOR_ASMT_RFRNC_DT	V0100C Prior Assessment Reference Date		
548	V0100D_PRIOR_BIMS_SCRE_NUM	V0100D Prior Assessment Brief Interview for Mental Status (BIMS) Summary Score Number		
549	V0100E_PRIOR_MOOD_SCRE_NUM	V0100E Prior Assessment Resident Mood Interview (PHQ-9) Total Severity Score Number		
550	V0200A01A_DLRM_CTR_CD	V0200A01A Delirium Care Area Trigger Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
551	V0200A01B_DLRM_CPL_CD	V0200A01B Delirium Addressed in Care Plan Code		
552	V0200A02A_DMNT_CTR_CD	V0200A02A Dementia Care Area Trigger Code		
553	V0200A02B_DMNT_CPL_CD	V0200A02B Dementia Addressed in Care Plan Code		
554	V0200A03A_VISL_FUNC_CTR_CD	V0200A03A Visual Function Care Area Trigger Code		
555	V0200A03B_VISL_FUNC_CPL_CD	V0200A03B Visual Function Addressed in Care Plan Code		
556	V0200A04A_COMMUN_CTR_CD	V0200A04A Communication Care Area Trigger Code		
557	V0200A04B_COMMUN_CPL_CD	V0200A04B Communication Addressed in Care Plan Code		
558	V0200A05A_ADL_CTR_CD	V0200A05A ADL Care Area Trigger Code		
559	V0200A05B_ADL_CPL_CD	V0200A05B ADL Addressed in Care Plan Code		
560	V0200A06A_URNRY_CTR_CD	V0200A06A Urinary Care Area Trigger Code		
561	V0200A06B_URNRY_CPL_CD	V0200A06B Urinary Addressed in Care Plan Code		
562	V0200A07A_PSYCHSOC_CTR_CD	V0200A07A Psychosocial Care Area Trigger Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
563	V0200A07B_PSYCHSOC_CPL_CD	V0200A07B Psychosocial Addressed in Care Plan Code		
564	V0200A08A_MOOD_CTR_CD	V0200A08A Mood Care Area Trigger Code		
565	V0200A08B_MOOD_CPL_CD	V0200A08B Mood Addressed in Care Plan Code		
566	V0200A09A_BHVRL_CTR_CD	V0200A09A Behavioral Care Area Trigger Code		
567	V0200A09B_BHVRL_CPL_CD	V0200A09B Behavioral Addressed in Care Plan Code		
568	V0200A10A_ACTVTY_CTR_CD	V0200A10A Activity Care Area Trigger Code		
569	V0200A10B_ACTVTY_CPL_CD	V0200A10B Activity Addressed in Care Plan Code		
570	V0200A11A_FALL_CTR_CD	V0200A11A Fall Care Area Trigger Code		
571	V0200A11B_FALL_CPL_CD	V0200A11B Fall Addressed in Care Plan Code		
572	V0200A12A_NTRNT_CTR_CD	V0200A12A Nutritional Care Area Trigger Code		
573	V0200A12B_NTRNT_CPL_CD	V0200A12B Nutritional Addressed in Care Plan Code		
574	V0200A13A_FEEDG_TUBE_CTR_CD	V0200A13A Feeding Tube Care Area Trigger Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
575	V0200A13B_FEEDG_TUBE_CPL_CD	V0200A13B Feeding Tube Addressed in Care Plan Code		
576	V0200A14A_DHYDRTN_CTR_CD	V0200A14A Dehydration Care Area Trigger Code		
577	V0200A14B_DHYDRTN_CPL_CD	V0200A14B Dehydration Addressed in Care Plan Code		
578	V0200A15A_DNTL_CTR_CD	V0200A15A Dental Care Area Trigger Code		
579	V0200A15B_DNTL_CPL_CD	V0200A15B Dental Addressed in Care Plan Code		
580	V0200A16A_PRSR_ULCR_CTR_CD	V0200A16A Pressure Ulcer Care Area Trigger Code		
581	V0200A16B_PRSR_ULCR_CPL_CD	V0200A16B Pressure Ulcer Addressed in Care Plan Code		
582	V0200A17A_PSYCH_DRUG_CTR_CD	V0200A17A Psychotropic Drug Care Area Trigger Code		
583	V0200A17B_PSYCH_DRUG_CPL_CD	V0200A17B Psychotropic Drug Addressed in Care Plan Code		
584	V0200A18A_RSTRNT_CTR_CD	V0200A18A Restraint Care Area Trigger Code		
585	V0200A18B_RSTRNT_CPL_CD	V0200A18B Restraint Addressed in Care Plan Code		
586	V0200A19A_PAIN_CTR_CD	V0200A19A Pain Care Area Trigger Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
587	V0200A19B_PAIN_CPL_CD	V0200A19B Pain Addressed in Care Plan Code		
588	V0200A20A_RTN_CMNTY_CTR_CD	V0200A20A Return to Community Care Area Trigger Code		
589	V0200A20B_RTN_CMNTY_CPL_CD	V0200A20B Return to Community Addressed in Care Plan Code		
590	V0200B2_CAT_DT	V0200B2 Care Area Assessment Completion Date		
591	V0200C2_CARE_PLN_DT	V0200C2 Care Plan Completion Date		
592	X0100_TRANS_TYPE_CD	X0100 Type of Record Code		
593	X0150_CRCTN_PRVDR_TYPE_CD	X0150 Correction Provider Type Code		
594	X0200A_CRCTN_FIRST_NAME	X0200A Correction Resident First Name		
595	X0200C_CRCTN_LAST_NAME	X0200C Correction Resident Last Name		
596	X0300_CRCTN_GNDR_CD	X0300 Correction Gender Code		
597	X0400_CRCTN_BIRTH_DT	X0400 Correction Birth Date		
598	X0500_CRCTN_SSN_NUM	X0500 Correction Social Security Number		
599	X0600A_CRCTN_FED_OBRA_CD	X0600A Correction Federal OBRA Reason for Assessment Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
600	X0600B_CRCTN_PPS_CD	X0600B Correction PPS Reason for Assessment Code		
601	X0600C_CRCTN_PPS_OMRA_CD	X0600C PPS Other Medicare Required Assessment (OMRA) Code		
602	X0600D_CRCTN_SB_CLNCL_CHG_CD	X0600D Correction Swing Bed Clinical Change Code		
603	X0600F_CRCTN_ENTRY_DSCHRG_CD	X0600F Correction Entry/Discharge Code		
604	X0700A_CRCTN_ASMT_RFRNC_DT	X0700A Correction Assessment Reference Date		
605	X0700B_CRCTN_DSCHRG_DT	X0700B Correction Discharge Date		
606	X0700C_CRCTN_ENTRY_DT	X0700C Correction Entry Date		
607	X0800_CRCTN_NUM	X0800 Correction Number		
608	X0900A_MDFCTN_TRNSCRPT_ERR_CD	X0900A Reason for Modification: Transcription Error Code		
609	X0900B_MDFCTN_ENTRY_ERR_CD	X0900B Reason for Modification: Data Entry Error Code		
610	X0900C_MDFCTN_SFTWR_ERR_CD	X0900C Reason for Modification: Software Product Error Code		
611	X0900D_MDFCTN_ITM_ERR_CD	X0900D Reason for Modification: Item Coding Error Code		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
612	X0900Z_MDFCTN_OTHR_CD	X0900Z Reason for Modification: Other Error Requiring Modification Code		
613	X1050A_INACTV_NO_EVNT_CD	X1050A Reason for Inactivation: Event Did Not Occur Code		
614	X1050Z_INACTV_OTHR_CD	X1050B Reason for Inactivation: Other Error Requiring Inactivation Code		
615	X1100A_ATSTR_FIRST_NAME	X1100A Attesting Individuals First Name		
616	X1100B_ATSTR_LAST_NAME	X1100B Attesting Individuals Last Name		
617	X1100E_ATSTN_DT	X1100E Attestation Date		
618	Z0100A_MDCR_HIPPS_TXT	Z0100A Medicare Part A HIPPS Code Text		
619	Z0100B_MDCR_RUG_VRSN_TXT	Z0100B Medicare Part A RUG Version Text		
620	Z0100C_MDCR_SHRT_STAY_CD	Z0100C Medicare Part A Short Stay Assessment Code		
621	Z0150A_MDCR_NTHRPY_HIPPS_TXT	Z0150A Medicare Part A Non-therapy HIPPS Code Text		
622	Z0150B_MDCR_NTHRPY_RUGVRSN_TXT	Z0150B Medicare Non-therapy Part A RUG Version Text		
623	Z0200A_STATE_RUG_GRP_TXT	Z0200A State Medicaid RUG Case Mix Group Text		

	SHORT SAS NAME	VARIABLE NAME	LIMITATION	CODE TABLE
624	Z0200B_STATE_RUG_VRSN_TXT	Z0200B State Medicaid RUG Version Text		
625	Z0250A_STATE_2_RUG_GRP_TXT	Z0250A Alternate State Medicaid RUG Case Mix Group Text		
626	Z0250B_STATE_2_RUG_VRSN_TXT	Z0250B Alternate State Medicaid RUG Version Text		
627	Z0500B_RN_SGN_CMPLT_DT	Z0500B Date RN Assessment Coordinator Signed Assessment as Complete		

Appendix 2

Design for Nursing Home Compare Five-Star Quality Rating System:

Technical Users' Guide

January 2017

Note: In July 2016, the Centers for Medicare & Medicaid Services (CMS) made several changes to the quality measure (QM) domain of the Five Star Nursing Home Quality Rating System. These include the addition of five new measures and several methodological changes. The new measures are:

- ***Percentage of short-stay residents who were successfully discharged to the community (claims-based)***
- ***Percentage of short-stay residents who have had an outpatient emergency department visit (claims-based)***
- ***Percentage of short-stay residents who were re-hospitalized after a nursing home admission (claims-based)***
- ***Percentage of short-stay residents who made improvements in function (MDS-based)***
- ***Percentage of long-stay residents whose ability to move independently worsened (MDS-based)***

These measures greatly expand the number of short-stay measures used on Nursing Home Compare and add important domains not covered by other measures. The five new QMs will be phased in between July 2016 and January 2017. As of January 2017, the five QMs incorporated into the rating in July 2016 have the same weight as the other eleven QMs.

The methodological changes introduced in July include:

- ***Using four quarters of data rather than three for determining QM ratings.***
- ***Reducing the minimum denominator for all measures (short-stay, long-stay, and claims-based) to 20 summed across four quarters.***
- ***Revising the imputation methodology for QMs with low denominators meeting specific criteria. A facility's own available data will be used and the state average will be used to reach the minimum denominator.***
- ***Using national cut points for assigning points for the ADL QM rather than state-specific thresholds.***

These changes are described in more detail in the Quality Measure Domain section of this document.

Introduction

In December 2008, The Centers for Medicare & Medicaid Services (CMS) enhanced its *Nursing Home Compare* public reporting site to include a set of quality ratings for each nursing home that participates in Medicare or Medicaid. The ratings take the form of several "star" ratings for each nursing home. The primary goal of this rating system is to provide residents and their families with an easy way to understand assessment of nursing home quality, making meaningful distinctions between high and low performing nursing homes.

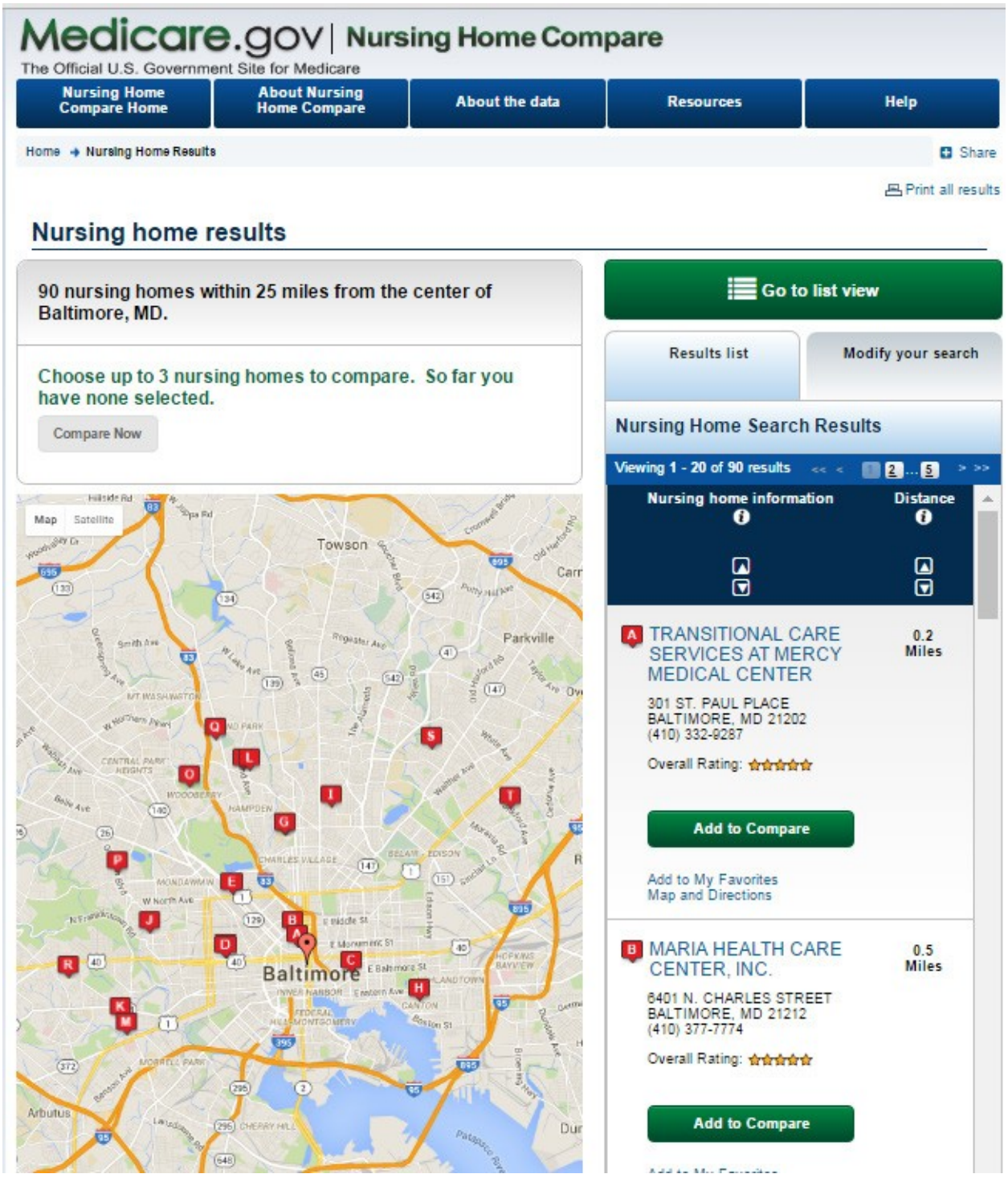
This document provides a comprehensive description of the design for the *Nursing Home Compare* Five-Star Quality Rating System. This design was developed by CMS with assistance from Abt Associates, invaluable advice from leading researchers in the long-term care field who comprise the Technical Expert Panel (TEP) for this project, and numerous ideas contributed by consumer and provider groups. All of these organizations and groups have continued to contribute their input as the rating system has been refined and updated to incorporate newly available data. We believe the Five-Star Quality Rating System continues to offer valuable and comprehensible information to consumers based on the best data currently available. The rating system features an Overall Quality Rating of one to five stars based on facility performance for three types of measures, each of which has its own five-star rating:

- ***Health Inspections - Measures based on outcomes from State health inspections:*** Facility ratings for the health inspection domain are based on the number, scope, and severity of deficiencies identified during the three most recent annual inspection surveys, as well as substantiated findings from the most recent 36 months of complaint investigations. All deficiency findings are weighted by scope and severity. This measure also takes into account the number of revisits required to ensure that deficiencies identified during the health inspection survey have been corrected.
- ***Staffing - Measures based on nursing home staffing levels:*** Facility ratings on the staffing domain are based on two measures: 1) Registered nurse (RN) hours per resident day; and 2) total staffing hours (RN+ licensed practical nurse (LPN) + nurse aide hours) per resident day. Other types of nursing home staff such as clerical or housekeeping staff are not included in these staffing numbers. These staffing measures are derived from the CMS Certification and Survey Provider Enhanced Reports (CASPER) system, and are case-mix adjusted based on the distribution of Minimum Data Set, Version 3.0 (MDS 3.0) assessments by Resource utilization groups, version III (RUG-III) group.
- ***QMs - Measures based on MDS and claims-based quality measures (QMs):*** Facility ratings for the quality measures are based on performance on 16 of the 24 QMs that are currently posted on the *Nursing Home Compare* web site, and that are based on MDS 3.0 assessments as well as hospital and emergency department claims. These include nine long-stay measures and seven short-stay measures.

In recognition of the multi-dimensional nature of nursing home quality, *Nursing Home Compare* displays information on facility ratings for each of these domains alongside the overall performance rating. Further, in addition to the overall staffing five-star rating mentioned above, a five-star rating for RN

staffing is also displayed separately on the Nursing Home Compare website, when users seek more information on the staffing component.

An example of the rating information included on *Nursing Home Compare* is shown in the figure below. Users of the web site can drill down on each domain to obtain additional details on facility performance.



A companion document to this Technical Users' Guide (*Nursing Home Compare* – Five Star Quality Rating System: Technical Users' Guide – State-Level Cut Point Tables) provides the data for the state-

level cut points for the star ratings included in the health inspection. The data table in the companion document will be updated monthly. Cut points for the staffing ratings have been fixed and do not vary

monthly. Data tables giving the cut points for the staffing ratings are included in Tables 4 and 5 in this Technical Users' Guide.

Methodology for Constructing the Ratings

Health Inspection Domain

Nursing homes that participate in the Medicare and/or Medicaid programs have an onsite recertification (standard) ("comprehensive") inspection annually *on average*, with very rarely more than fifteen months elapsing between inspections for any one particular nursing home. Inspections are unannounced and are conducted by a team of health care professionals who spend several days in the nursing home to assess whether the nursing home is in compliance with federal requirements. These inspections provide a comprehensive assessment of the nursing home, reviewing facility practice and policies in such areas as resident rights, quality of life, medication management, skin care, resident assessment, nursing home administration, environment, and kitchen/food services. The methodology for constructing the health inspection rating is based on the three most recent recertification surveys for each nursing home, complaint deficiencies during the most recent three-year period, and any repeat revisits needed to verify that required corrections have brought the facility back into compliance. The Five-Star Quality Rating System uses more than 200,000 records for the health inspection domain alone.

Scoring Rules

CMS calculates a health inspection score based on points assigned to deficiencies identified in each active provider's three most recent recertification health inspections, as well as on deficiency findings from the most recent three years of complaint inspections.

- ***Health Inspection Results***: Points are assigned to individual health deficiencies according to their scope and severity –more serious, widespread deficiencies receive more points, with additional points assigned for substandard quality of care (see Table 1).. If the status of the deficiency is "past non-compliance" and the severity is "immediate jeopardy" (i.e., J-, K- or L-level), then points associated with a G- level deficiency are assigned. Deficiencies from Life Safety surveys are not included in calculations for the Five-Star rating. Deficiencies from Federal Comparative Surveys are not reported on *Nursing Home Compare* or included in *Five Star* calculations, though the results of State Survey Agency determinations made during a Federal Oversight Survey are included.
- ***Repeat Revisits - Number of repeat revisits required to confirm that correction of deficiencies have restored compliance***: No points are assigned for the first revisit; points are assigned only for the second, third, and fourth revisits and are proportional to the health inspection score for the survey cycle (Table 2). If a provider fails to correct deficiencies by the time of the first revisit, then these additional revisit points are assigned up to 85 percent of the health inspection score for the fourth revisit. CMS experience is that providers who fail to demonstrate restored compliance with safety and quality of care requirements during the first revisit have lower quality of care than other nursing homes. More revisits are associated with more serious quality problems.

CMS calculates a total health inspection score for each facility. The total score is calculated as the facility's weighted deficiency score (including any repeat revisit points). Note that a lower survey score corresponds to fewer deficiencies and revisits, and thus better performance on the health inspection

domain. In calculating the total weighted score, more recent surveys are weighted more heavily than earlier surveys with the most recent period (cycle 1) being assigned a weighting factor of 1/2, the previous period (cycle 2) having a weighting factor of 1/3, and the second prior survey (cycle 3) having a weighting factor of 1/6. The individual weighted time period scores are then summed to create the total weighted survey score for each facility.

Complaint inspections are assigned to a time period based on the most recent 12 month period in which the complaint survey occurred. Complaint inspections that occurred within the most recent 12 months preceding the current web site update date receive a weighting factor of 1/2; those from 13-24 months ago have a weighting factor of 1/3, and those from 25-36 months ago have a weighting factor of 1/6. There are some deficiencies that appear on both standard and complaint inspections. To avoid potential double-counting, deficiencies that appear on complaint inspections that are conducted within 15 days of a recertification inspection (either prior to or after the recertification inspection) are counted only once. If the scope or severity differs between the two inspections, the highest scope-severity combination is used. Points from complaint deficiencies from a given period are added to the health inspection score before calculating revisit points, if applicable.

For facilities missing data for one period, the health inspection score is determined based on the periods for which data are available, using the same relative weights, with the missing (third) survey weight distributed proportionately to the existing two inspections. Specifically, when there are only two recertification inspections, the most recent receives 60 percent weight and the prior receives 40 percent weight. Facilities with only one standard health inspection are considered not to have sufficient data to determine a health inspection rating and are set to missing for the health inspection domain. For these facilities, no composite rating is assigned and no ratings are reported for the staffing or QM domains even if these ratings are available.

Table 1
Health Inspection Score: Weights for Different Types of Deficiencies

Severity	Scope		
	Isolated	**Pattern**	**Widespread**
Immediate jeopardy to resident health or safety	**J** 50 points* (75 points)	**K** 100 points* (125 points)	**L** 150 points* (175 points)
Actual harm that is not immediate jeopardy	**G** 20 points	**H** 35 points (40 points)	**I** 45 points (50 points)
No actual harm with potential for more than minimal harm that is not immediate jeopardy	**D** 4 points	**E** 8 points	**F** 16 points (20 points)
No actual harm with potential for minimal harm	**A** 0 point	**B** 0 points	**C** 0 points

Note: Figures in parentheses indicate points for deficiencies that are for substandard quality of care.

Shaded cells denote deficiency scope/severity levels that constitute substandard quality of care if the requirement which is not met is one that falls under the following federal regulations: 42 CFR 483.13 resident behavior and nursing home practices, 42 CFR 483.15 quality of life, 42 CFR 483.25 quality of care.

* If the status of the deficiency is “past non-compliance” and the severity is Immediate Jeopardy, then points associated with a ‘G-level” deficiency (i.e., 20 points) are assigned.

Source: Centers for Medicare & Medicaid Services

Table 2
Weights for Repeat Revisits

Revisit Number	Noncompliance Points
First	0
Second	50 percent of health inspection score
Third	70 percent of health inspection score
Fourth	85 percent of health inspection score

Note: The health inspection score includes points from deficiencies cited on the standard health inspection and complaint inspections during a given survey cycle.

Rating Methodology

Health inspections are based on federal regulations, which surveyors implement using national interpretive guidance and a federally-specified survey process. Federal staff train State inspectors and oversee State performance. The federal oversight includes quality checks based on a 5% sample of the health inspections performed by States, in which Federal inspectors either accompany State inspectors or replicate the inspection within 60 days of the State and then compare results. These control systems are designed to improve consistency in the survey process. Nonetheless there remains variation among states in both inspection process and outcomes. Such variation derives from many factors, including:

- ***Survey Management:*** Variation among states in the skill sets of inspectors, supervision of inspectors , and the inspection processes;
- ***State Licensure***: State licensing laws set forth different expectations for nursing homes and affect the interaction between State enforcement and Federal enforcement (for example, a few states conduct many complaint investigations based on State licensure, and issue citations based on State licensure rather than on the Federal regulations);
- ***Medicaid Policy:*** Medicaid pays for the largest proportion of long term care in nursing homes. Nursing home eligibility rules, payment, and other policies in the State-administered Medicaid program may be associated with differences in survey outcome.

For the above reasons, CMS bases Five-Star quality ratings in the health inspection domain on the relative performance of facilities within a state. This approach helps control for variation among states. CMS determines facility ratings using these criteria:

- The top 10 percent (with the lowest health inspection weighted scores) in each state receive a health inspection rating of five stars.
- The middle 70 percent of facilities receive a rating of two, three, or four stars, with an equal number (approximately 23.33 percent) in each rating category.
- The bottom 20 percent receive a one-star rating.

Cut points are re-calibrated each month so that the distribution of star ratings within states remains relatively constant over time. However, the rating for a given facility is held constant until there is a change in the weighted health inspection score for that facility, regardless of changes in the statewide distribution. Items that could change the health inspection score include the following:

- A new health inspection;
- A complaint investigation that results in one or more deficiency citations;
- A second, third, or fourth revisit;
- Resolution of an Informal Dispute Resolutions (IDR) or Independent Informal Dispute Resolutions (IIDR) resulting in changes to the scope and/or severity of deficiencies;
- The "aging" of complaint deficiencies. Specifically, as noted above, complaint surveys are assigned to a time period based on the most recent 12 month period in which the complaint survey occurred; thus, when a complaint deficiency ages into a different cycle, it receives less weight in the scoring process, resulting in a lower health inspection score and potentially a change in health inspection rating.

In the very rare case that a state or territory has fewer than five facilities upon which to generate the cut points, the national distribution of health inspection scores is used. Cut points for the health inspection ratings can be found in the Cut Point Table in the companion document to this Technical Users' Guide: Five Star Quality Rating System State-Level Cut Point Tables available in the 'downloads' section at: https://www.cms.gov/medicare/provider-enrollment-and-certification/certificationandcomplianc/fsqrs.html.

Staffing Domain

There is considerable evidence of a relationship between nursing home staffing levels and resident outcomes. The CMS Staffing Study found a clear association between nurse staffing ratios and nursing home quality of care, identifying specific ratios of staff to residents below which residents are at substantially higher risk of quality problems.[1]

The rating for staffing is based on two case-mix adjusted measures:

1. Total nursing hours per resident day (RN + LPN + nurse aide hours)
2. RN hours per resident day

The source document for the reported staffing hours is the CMS form CMS-671 (Long Term Care Facility Application for Medicare and Medicaid) obtained from CASPER. The resident census is based on the count of total residents from the CMS form CMS-672 (Resident Census and Conditions of Residents). The specific fields that are used in the RN, LPN, and nurse aide hour calculations are:

- RN hours: Includes registered nurses (tag number F41 on the CMS-671 form), RN director of nursing (F39), and nurses with administrative duties (F40).

[1] Kramer AM, Fish R. “The Relationship Between Nurse Staffing Levels and the Quality of Nursing Home Care.” Chapter 2 in Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes: Phase II Final Report. Abt Associates, Inc., Winter 2001.

- LPN hours: Includes licensed practical/licensed vocational nurses (F42)
- Nurse aide hours: Includes certified nurse aides (F43), aides in training (F44), and medication aides/technicians (F45)

Note that the CASPER staffing data include both facility employees (full time and part time) and individuals under an organization (agency) contract or an individual contract. The CASPER staffing data do not include "private duty" nursing staff reimbursed by a resident or his/her family. Also not included are hospice staff and feeding assistants. The staffing hours reported on the CMS-671 form are for the residents in the Medicare- and/or Medicaid-certified beds only.

CMS uses a set of exclusion criteria to identify facilities with highly improbable CASPER staffing data, and neither staffing data nor a staffing rating are reported for these facilities (displaying "Data Not Available" on the Nursing Home Compare website).

The resident census, used in the denominator of the staffing calculations uses data reported in block F78 of the CMS-672 form. This includes the total number of residents in Medicare- and/or Medicaid-certified beds and the number for whom a bed is being maintained on the day the nursing home survey begins (bed-holds). Bed-holds typically involve residents temporarily away in a hospital or on leave. The CMS- 671 form separately collects hours for full-time, part-time, and contract staff. These hours are converted to full-time equivalents (FTE), which are summed across full time, part time, and contract staff and converted to hours per resident per day (HRD) as follows:

$$\textbf{HRD = total hours for each nursing discipline/resident census/14 days}$$

This calculation is done separately for RNs, LPNs, and Nurse Aides as described above, and all three of these are summed to calculate total nursing hours.

Case-Mix Adjustment

CMS adjusts the reported staffing ratios for case-mix, using Resource Utilization Group (RUG-III) case-mix system. The CMS Staff Time Measurement Studies recorded the number of RN, LPN, and nurse aide minutes associated with each RUG-III group (using the 53 group version of RUG-III). CMS calculates case-mix adjusted hours per resident day for each facility for each staff type using this formula:

$$\textbf{Hours}_{\textbf{Adjusted}} = (\textbf{Hours}_{\textbf{Reported}}/\textbf{Hours}_{\textbf{Expected}}) * \textbf{Hours}_{\textbf{National Average}}$$

where $\text{Hours}_{\text{National Average}}$ is the mean across all facilities of the reported hours per resident day for a given staff type. The expected values are based on the distribution of residents by RUG-III group in the quarter closest to the date of the most recent standard survey (when the staffing data were collected) and measures of the expected RN, LPN, and nurse aide hours that are based on data from the CMS 1995 and 1997 Staff Time Measurement Studies (see Table A1). The distribution of residents by RUG-III group is determined using the most recent MDS assessment for current residents of the nursing home on the last day of the quarter.

The data used in the RUG calculations are based on a summary of MDS information for residents currently in the nursing home. The MDS assessment information for each active nursing home resident is

consolidated to create a profile of the most recent standard information for the resident. An active resident is defined as a resident who, on the last day of the quarter, has no discharge assessment and whose most recent MDS transaction is less than 180 days old (this allows for 93 days between quarterly assessments,

plus time for completion and submission of the assessments). The active resident information can represent a composite of items taken from the most recent OBRA-required and Scheduled-PPS assessments. Different items may come from different assessments. The intention is to create a profile with the most recent standard information for an active resident, regardless of source of information. These data are used to place each resident in a RUG category.

For the Five-Star rating, a "draw" of the most recent RUG category distribution data is done for every nursing facility on the last business day of the last month of each quarter. The Five-Star rating makes use of the distribution for the quarter in which the staffing data were collected. For each facility, a "target" date that is seven days prior to the most recent standard survey date is assigned. The rationale for this target is that the staffing data reported for CASPER covers the two-week period prior to the survey, with seven days being the midpoint of that interval. If RUG data are available for the facility for the quarter containing that survey "target" date, that quarter of RUG data is used for the case mix adjustment. In instances when the quarter of RUG data containing the survey target date is not available for a given facility, the quarter of available RUG data that is closest to that target date - either before or after – is selected. Closest is defined as having the smallest absolute value for the difference between the survey target date and the midpoint of the available RUG quarter(s). If the RUG data for the quarter in which the survey was conducted becomes available subsequently, the staffing rating will be recalculated to reflect these more appropriate data, and this might change the staffing rating. The staffing rating calculated using staffing data and RUG data from the same quarter will be held constant for a nursing home until new staffing data are collected for the facility.

Expected hours are calculated by summing the nursing times in minutes (from the CMS Time Study found in Appendix Table A1) connected to each RUG category across all residents in the category and across all categories. The total minutes are then divided by the number of residents included in the calculations. The number of minutes per resident is converted to hours by dividing by 60. The result is the "expected" number of hours per resident day for each nursing category.

The "reported" hours are those reported by the facility on the CMS-671 form from the most recent standard survey, while the "national average" hours (shown in Table 3) represent the unadjusted national mean of the reported hours across all facilities for December, 2011.

Table 3
National Average Hours per Resident Day Used To Calculate Adjusted Staffing (as of April 2012)

Type of staff	National average hours per resident per day
Total nursing staff (Aides + LPNs + RNs)	4.0309
Registered nurses	0.7472

The calculations of "expected", "reported", and "national average" hours are performed separately for RNs and for all staff delivering nursing care (RNs, LPNs, and CNAs). Adjusted hours are also calculated for both groups using the formula discussed earlier in this section.

A downloadable file that contains the "expected", "reported" and "case-mix adjusted" hours used in the staffing calculations is available at: http://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandComplianc/FSQRS.html. The file, referred to as the "Expected and Adjusted Staff Time Values Data Set," contains data for both RNs and total staff for each individual nursing home.

Scoring Rules

The two staffing measures (RN and total nursing staff) are given equal weight. For each of RN staffing and total staffing, a 1 to 5 rating is assigned based on a percentile-based method (where percentiles are based on the distribution for freestanding facilities[2]) (Table 4). For each facility, the overall staffing rating is assigned based on the combination of the two staffing ratings (Table 5).

The percentile cut points (data boundaries between each star category) were determined using the data available as of December 2011. This was the first update of the cut points since December 2008 and was necessary because of changes in the expected staffing due to MDS 3.0. The cut points were set so that the changes in expected staffing due to MDS 3.0 would not impact the overall distribution of the five-star ratings; that is, they were selected so that the proportion of nursing homes in each rating category would initially (i.e. for April 2012) be the same as it was in December 2011. CMS will evaluate whether further rebasing is needed on an annual basis. A major advantage of using fixed cut-points is that it allows the distribution of staffing ratings to change over time. Nursing homes that seek to improve their staffing rating, for example, can ascertain the increased levels at which they would earn a higher star rating for the staffing domain.

Table 4

National Star Cut Points for Staffing Measures, Based on Case-Mix Adjusted Hours per Resident Day (updated April 2012)

Staff type	1 star	2 stars lower	2 stars upper	3 stars lower	3 stars upper	4 stars lower	4 stars upper	5 stars
RN	< 0.283	≥0.283	< 0.379	≥0.379	< 0.513	≥0.513	< 0.710	≥0.710
Total	< 3.262	≥3.262	< 3.661	≥3.661	< 4.173	≥4.173	< 4.418	≥4.418

Note: Adjusted staffing values are rounded to three decimal places before the cut points are applied.

Rating Methodology

Facility ratings for overall staffing are based on the combination of RN and total nurse (RNs, LPNs, and CNAs) staffing ratings as shown in Table 5. To receive an overall staffing rating of five stars, facilities must achieve a rating of five stars for both RN and total staffing. To receive a four-star staffing rating, facilities must receive at least a three-star rating on one (either the RN or total nurse staffing) and a rating of four or five stars on the other.

[2] The distribution for freestanding facilities was used because of concerns about the reliability of staffing data for some hospital-based facilities.

Table 5

Staffing Points and Rating (updated February 2015)

RN rating and hours		Total nurse staffing rating and hours (RN, LPN and nurse aide)				
		1	2	3	4	5
		<3.262	3.262 – 3.660	3.661 – 4.172	4.173 – 4.417	≥4.418
1	<0.283	★	★	★★	★★	★★★
2	0.283 – 0.378	★	★★	★★★	★★★	★★★
3	0.379 – 0.512	★★	★★★	★★★	★★★★	★★★★
4	0.513 – 0.709	★★	★★★	★★★★	★★★★	★★★★
5	≥0.710	★★★	★★★	★★★★	★★★★	★★★★★

Note: Adjusted staffing values are rounded to three decimal places before the cut points are applied.

Quality Measure Domain

A set of quality measures (QMs) has been developed from Minimum Data Set (MDS) and Medicare claims data to describe the quality of care provided in nursing homes. These measures address a broad range of function and health status indicators. The facility rating for the QM domain is based on its performance on a subset of 13 (out of 24) of the MDS-based QMs and three MDS- and Medicare claims- based measures currently posted on Nursing Home Compare. The measures were selected based on their validity and reliability, the extent to which facility practice may affect the measure, statistical performance, and importance. Five additional measures (indicated below) were added to the Five-Star rating system in July 2016.

Measures for Long-Stay residents (residents in the facility for greater than 100 days) that are derived from MDS assessments:

- Percentage of residents whose need for help with activities of daily living has increased
- **(ADDED JULY 2016):** Percentage of residents whose ability to move independently worsened
- Percentage of high risk residents with pressure ulcers (sores)
- Percentage of residents who have/had a catheter inserted and left in their bladder
- Percentage of residents who were physically restrained
- Percentage of residents with a urinary tract infection
- Percentage of residents who self-report moderate to severe pain
- Percentage of residents experiencing one or more falls with major injury
- Percentage of residents who received an antipsychotic medication

Measures for Short-Stay residents that are derived from MDS assessments:

- **(ADDED JULY 2016):** Percentage of residents whose physical function improves from admission to discharge

- Percentage of residents with pressure ulcers (sores) that are new or worsened
- Percentage of residents who self-report moderate to severe pain
- Percentage of residents who newly received an antipsychotic medication

Measures for Short-Stay residents that are derived from claims data and MDS assessments:

- **(ADDED JULY 2016):** Percentage of residents who were re-hospitalized after a nursing home admission
- **(ADDED JULY 2016):** Percentage of residents who have had an outpatient emergency department visit
- **(ADDED JULY 2016):** Percentage of residents who were successfully discharged to the community

Table 6 contains more detailed information on these measures. Technical specifications for the complete set of MDS-based QMs are available at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/MDS-30-QM-Users-Manual-V10.pdf Technical specifications for the claims-based measures are available at: https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandComplianc/Downloads/New-Measures-Technical-Specifications-DRAFT-04-05-16-.pdf.

Values for five of the MDS-based QMs (mobility decline, catheter, long-stay pain, short-stay functional improvement, and short-stay pressure ulcers) are risk adjusted, using resident-level covariates that adjust for resident factors associated with differences in the performance on the QM. For example, the catheter risk-adjustment model takes into account whether or not residents had bowel incontinence or pressure sores on the prior assessment. Additionally, all three of the claims-based measures are also risk adjusted using both items from Medicare Part A claims that preceded the start of the nursing home stay and information from the first MDS assessment associated with the nursing home stay.

The risk-adjustment methodology is described in more detail in the technical specification documents referenced above. The covariates and the coefficients used in the risk-adjustment models are reported in Table A-2 in the Appendix.

CMS calculates ratings for the QM domain using the **four** most recent quarters for which data are available. This time period specification was selected to increase the number of assessments available for calculating the QM rating. This increases the stability of estimates and reduces the amount of missing data. The adjusted four-quarter QM values for each of the MDS-based QMs used in the five-star algorithm are computed as follows:

$$QM_{4Quarter} = [(QM_{Q1} * D_{Q1}) + (QM_{Q2} * D_{Q2}) + (QM_{Q3} * D_{Q3}) + (QM_{Q4} * D_{Q4})]/(D_{Q1} + D_{Q2} + D_{Q3} + D_{Q4})$$

Where QM_{Q1}, QM_{Q2}, QM_{Q3}, and QM_{Q4} correspond to the adjusted QM values for the four most recent quarters and D_{Q1}, D_{Q2}, and D_{Q3} D_{Q4} are the denominators (number of eligible residents for the particular QM) for the same four quarters.

Values for the three claims-based measures are calculated in a similar manner, except that the data used to calculate the measures use a full year of data rather than being broken out separately by quarter.

Table 6 Quality Measures Used in the Five-Star Quality Measure Rating Calculation

Measure	Comments
MDS Long-Stay Measures	
Percentage of residents whose ability to move independently worsened	This measure is a change measure that reports the percent of long-stay residents who have demonstrated a decline in independence of locomotion when comparing the target assessment to a prior assessment. Residents who lose mobility may also lose the ability to perform other activities of daily living, like eating, dressing, or getting to the bathroom.
Percentage of residents whose need for help with activities of daily living has increased[1]	This measure reports the percentage of long-stay residents whose need for help with late-loss Activities of Daily Living (ADLs) has increased when compared to the prior assessment. This is a change measure that reflects worsening performance on at least two late loss ADLs by one functional level or on one late loss ADL by more than one functional level compared to the prior assessment. The late loss ADLs are bed mobility, transfer, eating, and toileting. Maintenance of ADLs is related to an environment in which the resident is up and out of bed and engaged in activities. The CMS Staffing Study found that higher staffing levels were associated with lower rates of increasing dependence in ADLs.
Percentage of high-risk residents with pressure ulcers	This measure captures the percentage of long-stay, high-risk residents with Stage II-IV pressure ulcers**.** Residents at high risk for pressure ulcers are those who are impaired in bed mobility or transfer, who are comatose, or who suffer from malnutrition.
Percentage of residents who have/had a catheter inserted and left in their bladder	This measure reports the percentage of residents who have had an indwelling catheter in the last seven days. Indwelling catheter use may result in complications, like urinary tract or blood infections, physical injury, skin problems, bladder stones, or blood in the urine.
Percentage of residents who were physically restrained	This measure reports the percentage of long-stay residents who are physically restrained on a daily basis. A resident who is restrained daily can become weak, lose his or her ability to go to the bathroom without help, and develop pressure ulcers or other medical complications.
Percentage of residents with a urinary tract infection	This measure reports the percentage of long-stay residents who have had a urinary tract infection within the past 30 days. Urinary tract infections can often be prevented through hygiene and drinking enough fluid. Urinary tract infections are relatively minor but can lead to more serious problems and cause complications like delirium if not treated.
Percentage of residents who self-report moderate to severe pain	This measure captures the percentage of long-stay residents who report either (1) almost constant or frequent moderate to severe pain in the last five days or (2) any very severe/horrible pain in the last 5 days.
Percentage of residents experiencing one or more falls with major injury	This measure reports the percentage of long-stay residents who have experienced one or more falls with major injury reported in the target period or look-back period (one full calendar year).
Percentage of residents who received an antipsychotic medication	This measure reports the percentage of long-stay residents who are receiving antipsychotic drugs in the target period. Reducing the rate of antipsychotic medication use has been the focus of several CMS initiatives.
MDS Short-Stay Measures	
Percentage of residents whose physical function improves from admission to discharge	This measure assesses the percentage of short-stay residents whose independence in three mobility functions (i.e., transfer, locomotion, and walking) increases over the course of the nursing home care episode.
Percentage of residents with pressure ulcers that are new or worsened	This measure captures the percentage of short-stay residents with new or worsening Stage II-IV pressure ulcers.

Percentage of residents who self-report moderate to severe pain	This measure captures the percentage of short-stay residents, with at least one episode of moderate/severe pain or horrible/excruciating pain of any frequency, in the last 5 days.

Table 6 Quality Measures Used in the Five-Star Quality Measure Rating Calculation

Measure	Comments
Percentage of residents who newly received an antipsychotic medication	This measure reports the percentage of short-stay residents who are receiving an antipsychotic medication during the target period but not on their initial assessment.
Claims-Based Short-Stay Measures	
Percentage of residents who were re-hospitalized after a nursing home admission	This measure reports the percentage of all new admissions or readmissions to a nursing home from a hospital where the resident was re-admitted to a hospital for an inpatient or observation stay within 30 days of entry or reentry.
Percentage of short-stay residents who have had an outpatient emergency department (ED) visit	This measure reports the percentage of all new admissions or readmissions to a nursing home from a hospital where the resident had an outpatient ED visit (i.e., an ED visit not resulting in an inpatient hospital admission) within 30 days of entry or reentry.
Percentage of short-stay residents who were successfully discharged to the community	This measure reports the percentage of all new admissions to a nursing home from a hospital where the resident was discharged to the community within 100 calendar days of entry and for 30 subsequent days, did not die, was not admitted to a hospital for an unplanned inpatient stay, and was not readmitted to a nursing home.

[1]Indicates ADL QM as referenced in scoring rules
Sources: Based on information from the AHRQ Measures Clearinghouse and the NHVBP Draft Design Report and the MDS 3.0 Quality Measures User's Manual.

Missing Data and Imputation

Consistent with the specifications used for *Nursing Home Compare,* MDS-based measures are reported if the measure can be calculated for at least 20 residents' assessments (summed across **four** quarters of data to enhance measurement stability) for both the long- and short-stay QMs. The claims-based measures are reported if the measure can be calculated for at least 20 nursing home stays over the course of the year.

For facilities with missing data or an inadequate denominator size for one or more QMs, meeting the criteria described below, all available data from the facility are used. The remaining assessments (or stays) are imputed to get the facility to the minimum required sample size of 20. For example, if a facility had actual data for 12 resident assessments, the data for those 12 assessments would be used and the remaining eight assessments would be imputed using the state average to get to the minimum sample size to include the measure in the scoring for the QM rating. Missing values are imputed based on the statewide average for the measure. The imputation strategy for the missing values depends on the pattern of missing data.

- For facilities that have an adequate denominator size for at least five of the nine long-stay QMs, values are imputed for the long-stay measures with fewer than 20 assessments as described above. Points are then assigned for all nine long-stay QMs according to the scoring rules described below.
- For facilities that have an adequate denominator size for at least four of the seven short-stay QMs (including at least one of the three claims-based measures), values are imputed for the short-stay measures with smaller denominators as described above. Points are then assigned for all seven short-stay QMs according to the scoring rules described below.
- For facilities with adequate denominator sizes on four or fewer long-stay QMs, the QM rating is based on the short-stay measures only. Values for the missing long-stay QMs are not imputed,

and no long-stay measures are used in determining the QM rating.

- Similarly, for facilities with adequate denominator sizes for three or fewer short-stay QMs or no claims-based QMs, the QM rating is based on the long-stay measures only. Values for the missing short-stay QMs are not imputed, and no short-stay measures are used in determining the QM rating. One exception to this is for a small number of nursing homes that have adequate denominators for all four of the MDS-based short-stay measures but none of the claims-based measures. For these nursing homes, values are not imputed for the claims-based measures; however, the points assigned for the MDS-based short-stay measures are used in generating the QM rating according to the scoring rules described below.

Scoring Rules for the Individual QMs

For each measure, 20 to 100 points (50 points for the new QMs in July 2016) are assigned based on facility performance relative to the national distribution of the QM. Points are assigned after any needed imputation of individual QM values, with the points determined in the following way:

- For long-stay ADL worsening, long-stay pressure ulcers, long-stay catheter, long-stay urinary tract infections, long-stay pain, long-stay injurious falls, and short-stay pain: facilities are grouped into quintiles based on the national distribution of the QM. The quintiles are assigned 20 points for the poorest performing quintile, 100 points for the best performing quintile, and 40, 60 or 80 points for the second, third and fourth quintiles respectively.
- The **long-stay physical restraint** and **short-stay pressure ulcer** QMs are treated slightly differently because they have low prevalence – specifically, substantially more than 20 percent (i.e. a quintile) of nursing homes have zero percent rates on these measures.
    - For the **long-stay physical restraint** QM, facilities achieving the best possible score on the QM (i.e. zero percent of residents triggering the QM) are assigned 100 points; this is about 60 percent of facilities (or three quintiles). The remaining facilities are divided into two evenly sized groups, (each with about 20 percent of nursing homes); the poorer performing group is assigned 20 points, and the better performing group is assigned 60 points.
    - The **short-stay pressure ulcer** QM is treated similarly: facilities achieving the best possible score on the QM (i.e. zero percent of residents triggering the QM) are assigned 100 points; this is about one-third of nursing homes. The remaining facilities are divided into three evenly sized groups, (each with about 23 percent of nursing homes) and assigned 25, 50 or 75 points.
- For measures that were added to the QM rating beginning in February 2015, the following scoring rules use used:
    - For the **long-stay antipsychotic medication**, **long-stay mobility decline**, **short-stay functional improvement**, and the **three claims-based measures**, facilities are divided into five groups based on the national distribution of the measure. The top-performing 10 percent of facilities receive 100 points; the poorest performing 20 percent of facilities receive 20 points; the middle 70 percent of facilities are divided into three equally sized groups (each including approximately 23.3 percent of nursing homes) and receive 40, 60 or 80 points.
    - The **short-stay antipsychotic medication** QM is treated similarly; however, because

approximately 20 percent of facilities achieve the best possible score on this QM (i.e. zero percent of residents triggering the QM), these facilities all receive 100 points; the

poorest performing 20 percent of facilities receive 20 points; the remaining facilities are divided into three equally sized groups (each including approximately 20 percent of nursing homes) and receive 40, 60 or 80 points.

Note that, for all of the measures, the groupings are based on the national distribution of the QMs, prior to any imputation. For each of the MDS-derived QMs, the cut points are based on the QM distributions averaged across the four quarters of 2015. For the claims-based QMs, the cut points are based on the national distribution of the measures calculated for the period of Quarter 3 of 2014 through Quarter 2 of 2015.

Rating Methodology

After any needed imputation for individual QMs, the points are summed across all QMs based upon the scoring rules above to create a total score for each facility. The total possible score ranges between 325 and 1,600 in January 2017.

Facilities that receive a QM rating are in one of the following categories:

- They have points for all of the QMs.
- They have points for only the nine long-stay QMs (long-stay facilities).
- They have points for the nine long-stay QMs and the 4 MDS-based short-stay QMs
- They have points for only the seven short-stay QMs (short-stay facilities)
- They have points for only the four MDS-based short-stay QMs
- No values are imputed for nursing homes with data on fewer than five long-stay QMs and fewer than four short-stay QMs. No QM rating is generated for these nursing homes.

To ensure that all facilities are scored on the same scale, the total score is rescaled for long and short-stay facilities:

- If the facility has data for only the nine long-stay measures, the average of these point values is assigned for each of the seven (missing) short-stay measures and the total score is recalculated.
- If the facility has data for the nine long-stay QMs and the four MDS-based short-stay QMs but not the claims-based QMs, the average of the point values for the MDS-based short-stay QMs is assigned for each of the three (missing) claims-based measures and the total score is recalculated.
- If the facility has data for only the seven short-stay measures, the average of these point values is assigned for each of the nine (missing) long-stay measures and the total score is recalculated.
- If the facility has data for only the four MDS-based short stay QMs, but none of the long-stay QMs or the claims-based QMs, the average of the point values for the MDS-based short-stay QMs is assigned for each of the nine (missing) long-stay measures and each of the three (missing) claims-based measures and the total score is recalculated.

Once the summary QM score is computed for each facility as described above, the five-star QM rating is assigned, according to the point thresholds shown in Table 7. These thresholds were set so that the overall

proportion of nursing homes would be approximately 25 percent five-star, 20 percent for each of two-, three-, and four-star and 15 percent one-star, which was the distribution in February 2015 (the previous time that new measures were added and rebasing was required). The cut points associated with these star

ratings will be held constant for a period of one year (from January 2017), allowing the distribution of the QM rating to change over time.

Table 7
Star Cut-points for Quality Measure Summary Score
(updated January 2017)

QM Rating	Point Range July 2016	Point Range January 2017
★	275 – 669	325 – 789
★★	670 – 759	790 – 889
★★★	760 – 829	890 – 969
★★★★	830 – 904	970 – 1054
★★★★★	905 – 1350	1055 – 1600

Overall Nursing Home Rating (Composite Measure)

Based on the star ratings for the health inspection domain, the staffing domain and the MDS quality measure domain, CMS assigns the overall Five-Star rating in three steps:

Step 1: Start with the health inspection rating.

Step 2: Add one star to the Step 1 result if the staffing rating is four or five stars ***and greater than*** the health inspection rating; subtract one star if the staffing rating is one star. The overall rating cannot be more than five stars or less than one star.

Step 3: Add one star to the Step 2 result if the quality measure rating is five stars; subtract one star if the quality measure rating is one star. The overall rating cannot be more than five stars or less than one star.

Note: If the health inspection rating is one star, then the overall rating cannot be upgraded by more than one star based on the staffing and quality measure ratings. If the nursing home is a Special Focus Facility (SFF) that has not graduated, the maximum overall rating is three stars.

The rationale for upgrading facilities in Step 2 that receive a rating of four of five stars for staffing (rather than limiting the upgrade to those with five stars) is that the criteria for the staffing rating is quite stringent. However, requiring that the staffing rating be greater than the health inspection rating in order for the score to be upgraded ensures that a facility with four stars on health inspections and four stars on staffing (and more than one star on the quality measure rating) does not receive an overall rating of five stars.

The rationale for limiting star rating upgrades is that two self-reported data domains should not significantly outweigh the rating from actual onsite visits from trained surveyors who have found very

serious quality of care problems. Since the health inspection rating is heavily weighted toward the most recent findings, a health inspection rating of one star reflects both a serious and recent finding.

The rationale for limiting the overall rating of a Special Focus Facility (SFF) is that the health inspection rating is weighted toward more recent results and may not fully capture the long history of "yo-yo" or "in and out" of compliance with federal safety and quality of care requirements that some nursing homes exhibit. That type of history can be characteristic of the SFF nursing homes. The Nursing Home Compare web site should reflect the most recent data available so consumers can monitor facility performance, however, the overall rating will be capped out of caution that the prior "yo-yo" pattern could be repeated. Once a facility graduates from the SFF initiative by sustaining improved compliance for about 12 months, the cap will be removed for the former SFF nursing home.

The method for determining the overall nursing home rating does not assign specific weights to the health inspection, staffing, and QM domains. The health inspection rating is the most important dimension in determining the overall rating, but, depending on the performance on the staffing and QM domains, the overall rating for a facility may be increased or decreased by up to two stars.

If a facility has no health inspection rating, then no overall rating is assigned. If a facility has no health inspection rating because it is too new to have two standard surveys, then no ratings for any domain are displayed.

Change in Nursing Home Rating

Facilities may see a change in their overall rating for a number of reasons. Since the overall rating is based on three individual domains, a change in any one of the domains can affect the overall rating.

Provided below are some potential reasons that a change in a domain could occur:

New Data for the Facility

Any new data for a facility could potentially change a star rating domain.

Events that could change the health inspection score include:

- A new health inspection,
- New complaint deficiencies,
- A second, third, or fourth revisit,
- Resolution of an Informal Dispute Resolutions (IDR) or Independent Informal Dispute Resolutions (IIDR) resulting in changes to the scope and/or severity of deficiencies, or
- The "aging" of complaint deficiencies.

The data will be included as soon as they become part of the CMS database. The timing for this can vary by state and depends on having the complete survey package for the State Survey Agency to upload to the national database. Additional inspection data may be added to the database at any time because of complaint investigations, outcomes of revisits, Informal Dispute Resolutions (IDR), or Independent

Informal Dispute Resolutions (IIDR). These data may not be added in the same cycle as the standard inspection data.

Another reason the health inspection data (and therefore the rating) for a facility may change is the “aging” of one or more complaint deficiencies. Specifically, complaint investigations are assigned to a time period based on the most recent 12 month period in which the complaint investigation occurred. Thus, when a complaint deficiency ages into a prior period, it receives less weight in the scoring process and thus the weighted health inspection score may change and be compared to the state distribution at that time.

CASPER staffing data are collected at the time of the health inspection, so new staffing data will be added for a facility approximately annually. The case-mix adjustment for the staffing data is based on MDS assessment data for the current residents of the nursing home on the last day of the quarter in which the staffing data were collected (i.e. the quarter closest to the standard survey date). If the RUG data for the quarter in which the staffing data were collected are not available for a given facility, the quarter of available RUG data closest to the survey target date - either before or after – is selected. If the RUG data for the quarter in which the survey was conducted becomes available subsequently, the staffing rating will be recalculated to reflect these more appropriate data, and this might change the staffing rating. The staffing rating calculated using staffing data and RUG data from the same quarter will be held constant for a nursing home until new staffing data are collected for the facility.

Quality Measure data for the MDS-based QMs are updated on Nursing Home Compare on a quarterly basis, and the nursing home QM rating is updated at the same time. The updates occur mid-month in January, April, July, and October. The claims-based QM data will update every six months (in April and October). Changes in the quality measures may change the star rating.

Since the cut-points between star categories for the health inspection rating are based on percentile distributions that are not fixed, those cut-points may vary slightly depending on the current facility distribution in the database. However, while the cut-points for the health inspection ratings may change from month to month, the rating for a given facility is held constant until there is a change in the weighted health inspection score for that facility.

Appendix

Table A1 RUG Based Case-Mix Adjusted Nurse and Aide Staffing Minute Estimates					
1995-1997 Time Study Average Times (Minutes)					
RUG-53	**Resident Specific Time + Non-Resident Specific Time Minutes**				
Group	**STAFF TYPE**				**Total Minutes**
	RN	**LPN**	**Nurse Total**	**AIDE**	**All Staff Types**
REHAB & EXTENSIVE					
RUX	160.67	84.89	245.56	200.67	446.22
RUL	127.90	59.19	187.10	134.57	321.67
RVX	137.28	58.33	195.61	167.54	363.15
RVL	128.93	47.75	176.67	124.30	300.97
RHX	130.42	48.69	179.12	155.39	334.50
RHL	117.25	69.00	186.25	127.00	313.25
RMX	163.88	91.36	255.24	195.76	450.99
RML	166.61	62.68	229.29	147.07	376.36
RLX	116.87	55.13	172.00	132.63	304.63
REHABILITATION					
REHAB ULTRA HIGH					
RUC	100.75	46.03	146.78	174.86	321.64
RUB	84.12	34.94	119.06	123.13	242.19
RUA	64.98	39.49	104.47	97.91	202.38
REHAB VERY HIGH					
RVC	93.31	50.21	143.52	163.59	307.10
RVB	85.90	42.54	128.44	138.37	266.81
RVA	72.04	26.53	98.56	103.49	202.05
REHAB HIGH					
RHC	94.85	45.04	139.89	166.48	306.37
RHB	100.85	34.80	135.65	130.40	266.05
RHA	89.76	27.51	117.27	102.59	219.85
REHAB MEDIUM					
RMC	78.01	49.35	127.37	172.16	299.53
RMB	88.69	38.05	126.73	140.23	266.96
RMA	94.15	34.41	128.55	116.54	245.10

REHAB LOW					
RLB	69.38	46.52	115.91	196.33	312.24
RLA	60.88	33.02	93.89	124.29	218.18

Table A1 RUG Based Case-Mix Adjusted Nurse and Aide Staffing Minute Estimates					
1995-1997 Time Study Average Times (Minutes)					
RUG-53	**Resident Specific Time + Non-Resident Specific Time Minutes**				
Group	**STAFF TYPE**				**Total Minutes**
	RN	**LPN**	**Nurse Total**	**AIDE**	**All Staff Types**
EXTENSIVE					
SE3	143.56	101.33	244.89	193.50	438.39
SE2	108.52	86.06	194.58	163.54	358.12
SE1	80.79	57.68	138.47	191.79	330.26
SPECIAL					
SSC	72.9	64.3	137.20	184.1	321.30
SSB	70.9	55.0	125.90	172.4	298.30
SSA	91.7	41.7	133.40	130.4	263.80
CLINICALLY COMPLEX					
CC2	85.2	42.50	127.70	191.1	318.80
CC1	55.7	57.70	113.40	176.9	290.30
CB2	61.5	41.80	103.30	159.0	262.30
CB1	59.0	36.20	95.20	147.3	242.50
CA2	58.8	43.30	102.10	130.3	232.40
CA1	59.7	37.60	97.30	103.3	200.60
IMPAIRED COGNITION					
IB2	40.0	32.0	72.00	137.2	209.20
IB1	39.0	32.0	71.00	130.0	201.00
IA2	38.0	27.0	65.00	100.0	165.00
IA1	33.0	26.0	59.00	96.0	155.00
BEHAVIOR					
BB2	40.0	30.0	70.00	136.0	206.00
BB1	38.0	28.0	66.00	130.0	196.00
BA2	38.0	30.0	68.00	90.0	158.00
BA1	34.0	25.0	59.00	73.5	132.50

Table A1
RUG Based Case-Mix Adjusted Nurse and Aide Staffing Minute Estimates

1995-1997 Time Study Average Times (Minutes)

RUG-53	Resident Specific Time + Non-Resident Specific Time Minutes				
Group	STAFF TYPE				Total Minutes
	RN	LPN	Nurse Total	AIDE	All Staff Types
PHYSICAL FUNCTION					
PE2	37.0	32.0	69.00	184.8	253.80
PE1	37.0	29.4	66.40	181.6	248.00
PD2	36.0	25.0	61.00	170.0	231.00
PD1	36.0	27.6	63.60	160.0	223.60
PC2	25.6	32.8	58.40	154.4	212.80
PC1	45.1	20.6	65.70	124.2	189.90
PB2	28.0	36.8	64.80	80.6	145.40
PB1	27.5	27.7	55.20	93.9	149.10
PA2	31.9	30.6	62.50	72.9	135.40
PA1	28.2	29.8	58.00	72.8	130.80

Table A2
Coefficients for Risk-Adjustment Model

Quality Measure/Covariate	Constant (Intercept)	Coefficient
Percentage of long-stay residents who had a catheter inserted and left in their bladder	-3.645993	
1. Indicator of frequent bowel incontinence on prior assessment		0.545108
2. Indicator of pressure sores at stages II, III, or IV on prior assessment		1.967017
Percentage of long-stay residents who self-report moderate to severe pain	-2.428281	
1. Indicator of independence or modified independence in daily decision making on the prior assessment		1.044019
Percentage of short-stay residents with pressure ulcers that are new or worsened	-5.204646	
1. Indicator of requiring limited or more assistance in bed mobility on the initial assessment		1.013114
2. Indicator of bowel incontinence at least occasionally on initial assessment		0.835473
3. Indicator of diabetes or peripheral vascular disease on the initial assessment		0.412676
4. Indicator of low body mass index on the initial assessment		0.373643

Source: http://www.cms.hhs.gov/NursingHomeQualityInits/Downloads/NHQIQMUsersManual.pdf

Table A3

Ranges for Point Values for Quality Measures, Using Four Quarter Average Distributions[1, 4]

Quality measure	For QM values		Number of QM points is…[2]	
	between...	and...	July 2016	January 2017
ADL Decline (long-stay)	0.00000000	0.10049021	100	100
	0.10049022	0.13483145	80	80
	0.13483146	0.16778523	60	60
	0.16778524	0.20794393	40	40
	0.20794394	1.00000000	20	20
Moderate to Severe Pain (long-stay)	0.00000000	0.02201134	100	100
	0.02201135	0.04988420	80	80
	0.04988421	0.08311380	60	60
	0.08311381	0.13081113	40	40
	0.13081114	1.00000000	20	20
High risk pressure Ulcers (long-stay)	0.00000000	0.02654868	100	100
	0.02654869	0.04453437	80	80
	0.04453438	0.06181819	60	60
	0.06181820	0.08633095	40	40
	0.08633096	1.00000000	20	20
Catheter (long-Stay)	0.00000000	0.01073927	100	100
	0.01073928	0.02094371	80	80
	0.02094372	0.03178361	60	60
	0.03178362	0.04745521	40	40
	0.04745522	1.00000000	20	20
Urinary Tract Infection (long-stay)	0.00000000	0.01851851	100	100
	0.01851852	0.03423682	80	80
	0.03423683	0.05128203	60	60
	0.05128204	0.07598784	40	40
	0.07598785	1.00000000	20	20
Physical Restraints (long-stay)	0.00000000	0.00000000	100	100
	0.00000001	0.01424503	60	60

	0.01424504	1.00000000	20	20

Quality measure	For QM values		Number of QM points is…[2]	
	between...	and...	July 2016	January 2017
Injurious Falls (long-stay)	0.00000000	0.01315789	100	100
	0.01315790	0.02403848	80	80
	0.02403849	0.03511052	60	60
	0.03511053	0.05035973	40	40
	0.05035974	1.00000000	20	20
Antipsychotic Meds (long-stay)	0.00000000	0.06843265	100	100
	0.06843266	0.12704916	80	80
	0.12704917	0.17391305	60	60
	0.17391306	0.23979592	40	40
	0.23979593	1.00000000	20	20
Moderate to Severe Pain (short-stay)	0.00000000	0.07359305	100	100
	0.07359306	0.13229570	80	80
	0.13229571	0.18827161	60	60
	0.18827162	0.26041665	40	40
	0.26041666	1.00000000	20	20
New or Worsening Pressure Ulcers (short-stay)	0.00000000	0.00000000	100	100
	0.00000001	0.00692691	75	75
	0.00692692	0.01566247	50	50
	0.01566248	1.00000000	25	25
Antipsychotic Meds (short-stay)	0.00000000	0.00000000	100	100
	0.00000001	0.00999998	80	80
	0.00999999	0.01912567	60	60
	0.01912568	0.03486237	40	40
	0.03486238	1.00000000	20	20
Mobility decline (long-stay)[3]	0.00000000	0.08022493	50	100
	0.08022494	0.14454544	40	80
	0.14454545	0.19333225	30	60
	0.19333226	0.24905966	20	40
	0.24905967	1.00000000	10	20

Quality measure	For QM values		Number of QM points is…[2]	
	between...	and...	July 2016	January 2017
Functional Improvement (short-stay)[3]	0.81666872	1.00000000	50	100
	0.70966590	0.81666871	40	80
	0.62861965	0.70966589	30	60
	0.52015014	0.62861964	20	40
	0.00000000	0.52015013	10	20
Hospital readmission (short-stay)[3]	0.00000000	0.13839278	50	100
	0.13839279	0.18716279	40	80
	0.18716280	0.21886203	30	60
	0.21886204	0.25689121	20	40
	0.25689122	1.00000000	10	20
ED Visits (short-stay)[3]	0.00000000	0.05488714	50	100
	0.05488715	0.08944665	40	80
	0.08944666	0.11696705	30	60
	0.11696706	0.15529003	20	40
	0.15529004	1.00000000	10	20
Successful community discharge (short-stay)[3]	0.66448731	1.00000000	50	100
	0.59926791	0.66448730	40	80
	0.54906047	0.59926790	30	60
	0.47667646	0.54906046	20	40
	0.00000000	0.47667645	10	20

[1]For the claims-based measures (hospital readmission, ED visit, community discharge), points are based on data from 2014Q3 – 2015Q2. For the MDS-based measures (all others), points are based on data from 2015Q1 – 2015Q4. A higher QM value corresponds to better performance for all measures except functional improvement and successful community discharge where lower QM values correspond to better performance.

[2]The five new QMs (functional improvement, mobility decline, hospital readmission, ED visit, and community discharge) are
being phased into the QM rating. In July 2016 each contributed half the points of the other measures. In January 2017, the thresholds will remain the same but the points associated with each will double.

[3]Indicates one of the five new QMs as of July 2016 contributing half the points of the other 11 QMs. Starting in January 2017,
the new QMs will contribute the same number of points as the other measures.

[4]Thresholds for three quality measures were slightly changed on July 20, 2016 to correct errors in the earlier version of the TUG that was published on July 7, 2016. The thresholds that appeared in the July 7, 2016 version of the TUG were never used to calculate ratings that were publicly reported.

Appendix 3

Pairwise Comparisons

Dependent Variable	(I) EHR Level	(J) EHR Level	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
Emplyee Engagement Score	0	1	-2.694*	.498	.000	-3.888	-1.500
		2	-3.331*	.670	.000	-4.935	-1.727
	1	0	2.694*	.498	.000	1.500	3.888
		2	-.637	.712	1.000	-2.343	1.069
	2	0	3.331*	.670	.000	1.727	4.935
		1	.637	.712	1.000	-1.069	2.343
Staff Retention Rate	0	1	-.001	.005	1.000	-.013	.010
		2	.049*	.006	.000	.034	.064
	1	0	.001	.005	1.000	-.010	.013
		2	.050*	.007	.000	.034	.067
	2	0	-.049*	.006	.000	-.064	-.034
		1	-.050*	.007	.000	-.067	-.034
Total Staff Turnover %	0	1	.005	.004	.809	-.006	.015
		2	.021*	.006	.001	.007	.035
	1	0	-.005	.004	.809	-.015	.006
		2	.016*	.006	.029	.001	.031
	2	0	-.021*	.006	.001	-.035	-.007
		1	-.016*	.006	.029	-.031	-.001
CMS 5 Star	0	1	.335*	.049	.000	.218	.452
		2	.168*	.066	.032	.011	.325
	1	0	-.335*	.049	.000	-.452	-.218
		2	-.167	.070	.051	-.334	.000
	2	0	-.168*	.066	.032	-.325	-.011
		1	.167	.070	.051	.000	.334
CMS 5 Star Quality	0	1	.576*	.051	.000	.454	.698
		2	-.290*	.069	.000	-.454	-.125
	1	0	-.576*	.051	.000	-.698	-.454
		2	-.866*	.073	.000	-1.041	-.691
	2	0	.290*	.069	.000	.125	.454
		1	.866*	.073	.000	.691	1.041

Failed Revisit	0	1	.030*	.010	.009	.006	.054
		2	.024	.014	.217	-.008	.057
	1	0	-.030*	.010	.009	-.054	-.006
		2	-.005	.014	1.000	-.040	.029
	2	0	-.024	.014	.217	-.057	.008
		1	.005	.014	1.000	-.029	.040
Complaint Tags %	0	1	10.271*	1.013	.000	7.845	12.697
		2	1.188	1.361	1.000	-2.072	4.448
	1	0	-10.271*	1.013	.000	-12.697	-7.845
		2	-9.082*	1.447	.000	-12.549	-5.615
	2	0	-1.188	1.361	1.000	-4.448	2.072
		1	9.082*	1.447	.000	5.615	12.549
Facility Deficiency Index	0	1	.019	.044	1.000	-.086	.123
		2	-.155*	.059	.025	-.296	-.014
	1	0	-.019	.044	1.000	-.123	.086
		2	-.174*	.062	.017	-.323	-.024
	2	0	.155*	.059	.025	.014	.296
		1	.174*	.062	.017	.024	.323
Return to Hospital %	0	1	1.990*	.183	.000	1.552	2.427
		2	.923*	.246	.001	.335	1.511
	1	0	-1.990*	.183	.000	-2.427	-1.552
		2	-1.066*	.261	.000	-1.692	-.441
	2	0	-.923*	.246	.001	-1.511	-.335
		1	1.066*	.261	.000	.441	1.692
Over Time %	0	1	1.451*	.114	.000	1.178	1.723
		2	.084	.153	1.000	-.283	.450
	1	0	-1.451*	.114	.000	-1.723	-1.178
		2	-1.367*	.163	.000	-1.757	-.978
	2	0	-.084	.153	1.000	-.450	.283
		1	1.367*	.163	.000	.978	1.757
Bad Debt %	0	1	-.399	.241	.294	-.976	.178
		2	.035	.324	1.000	-.741	.811
	1	0	.399	.241	.294	-.178	.976
		2	.434	.344	.624	-.391	1.259
	2	0	-.035	.324	1.000	-.811	.741
		1	-.434	.344	.624	-1.259	.391

Revenue % of Budget	0	1	871.375	870.558	.951	-1213.884	2956.635
		2	366.156	1169.898	1.000	-2436.117	3168.429
	1	0	-871.375	870.558	.951	-2956.635	1213.884
		2	-505.219	1244.190	1.000	-3485.446	2475.007
	2	0	-366.156	1169.898	1.000	-3168.429	2436.117
		1	505.219	1244.190	1.000	-2475.007	3485.446

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix 4

SPSS Reports

```
GET
  FILE='C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final
Analysis\Jan2016-June2017Final Data Set-1.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Scott H\Documents\A Dissertation
SLH\Analysis\Final '+
    'Analysis\Jan2016-June2017Final Data Set-1.sav'
  /COMPRESSED.
DESCRIPTIVES VARIABLES=Facility
  /STATISTICS=MAX.
```

Descriptives

Notes

Output Created		30-SEP-2017 13:28:31
Comments		
Input	Data	C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=Facility /STATISTICS=MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

```
[DataSet1] C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final
Analysis\Jan2016-June2017Final Data Set-1.sav
```

Descriptive Statistics

	N	Maximum
Facility Identifier	3024	3264
Valid N (listwise)	3024	

```
FREQUENCIES VARIABLES=Facility
  /ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		30-SEP-2017 13:50:30
Comments		
Input	Data	C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Facility /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Statistics

Facility Identifier

N	Valid	3024
	Missing	0

Facility Identifier

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	301	18	.6	.6	.6
	303	18	.6	.6	1.2
	304	18	.6	.6	1.8
	350	18	.6	.6	2.4
	405	18	.6	.6	3.0
	406	18	.6	.6	3.6
	407	18	.6	.6	4.2
	409	18	.6	.6	4.8
	410	18	.6	.6	5.4
	411	18	.6	.6	6.0
	413	18	.6	.6	6.5
	414	18	.6	.6	7.1
	415	18	.6	.6	7.7
	416	18	.6	.6	8.3
	417	18	.6	.6	8.9
	418	18	.6	.6	9.5
	419	18	.6	.6	10.1
	420	18	.6	.6	10.7
	421	18	.6	.6	11.3
	422	18	.6	.6	11.9
	423	18	.6	.6	12.5
	424	18	.6	.6	13.1
	425	18	.6	.6	13.7
	426	18	.6	.6	14.3
	427	18	.6	.6	14.9
	428	18	.6	.6	15.5
	429	18	.6	.6	16.1
	430	18	.6	.6	16.7
	432	18	.6	.6	17.3

433	18	.6	.6	17.9
434	18	.6	.6	18.5
435	18	.6	.6	19.0
436	18	.6	.6	19.6
437	18	.6	.6	20.2
438	18	.6	.6	20.8
439	18	.6	.6	21.4
440	18	.6	.6	22.0
441	18	.6	.6	22.6
442	18	.6	.6	23.2
443	18	.6	.6	23.8
444	18	.6	.6	24.4
445	18	.6	.6	25.0
446	18	.6	.6	25.6
447	18	.6	.6	26.2
448	18	.6	.6	26.8
450	18	.6	.6	27.4
451	18	.6	.6	28.0
452	18	.6	.6	28.6
453	18	.6	.6	29.2
462	18	.6	.6	29.8
463	18	.6	.6	30.4
464	18	.6	.6	31.0
465	18	.6	.6	31.5
466	18	.6	.6	32.1
468	18	.6	.6	32.7
481	18	.6	.6	33.3
501	18	.6	.6	33.9
502	18	.6	.6	34.5
503	18	.6	.6	35.1
504	18	.6	.6	35.7
505	18	.6	.6	36.3
507	18	.6	.6	36.9
508	18	.6	.6	37.5
513	18	.6	.6	38.1
514	18	.6	.6	38.7
515	18	.6	.6	39.3

	517	18	.6	.6	39.9
	518	18	.6	.6	40.5
	519	18	.6	.6	41.1
	520	18	.6	.6	41.7
	521	18	.6	.6	42.3
	524	18	.6	.6	42.9
	526	18	.6	.6	43.5
	529	18	.6	.6	44.0
	531	18	.6	.6	44.6
	536	18	.6	.6	45.2
	540	18	.6	.6	45.8
	541	18	.6	.6	46.4
	542	18	.6	.6	47.0
	543	18	.6	.6	47.6
	546	18	.6	.6	48.2
	547	18	.6	.6	48.8
	549	18	.6	.6	49.4
	552	18	.6	.6	50.0
	556	18	.6	.6	50.6
	558	18	.6	.6	51.2
	559	18	.6	.6	51.8
	560	18	.6	.6	52.4
	562	18	.6	.6	53.0
	563	18	.6	.6	53.6
	564	18	.6	.6	54.2
	565	18	.6	.6	54.8
	566	18	.6	.6	55.4
	1078	18	.6	.6	56.0
	1079	18	.6	.6	56.5
	1080	18	.6	.6	57.1
	3101	18	.6	.6	57.7
	3102	18	.6	.6	58.3
	3103	18	.6	.6	58.9
	3104	18	.6	.6	59.5
	3105	18	.6	.6	60.1
	3106	18	.6	.6	60.7
	3107	18	.6	.6	61.3

	3108	18	.6	.6	61.9
	3109	18	.6	.6	62.5
	3110	18	.6	.6	63.1
	3111	18	.6	.6	63.7
	3112	18	.6	.6	64.3
	3113	18	.6	.6	64.9
	3114	18	.6	.6	65.5
	3115	18	.6	.6	66.1
	3116	18	.6	.6	66.7
	3117	18	.6	.6	67.3
	3118	18	.6	.6	67.9
	3119	18	.6	.6	68.5
	3120	18	.6	.6	69.0
	3121	18	.6	.6	69.6
	3200	18	.6	.6	70.2
	3201	18	.6	.6	70.8
	3202	18	.6	.6	71.4
	3203	18	.6	.6	72.0
	3204	18	.6	.6	72.6
	3205	18	.6	.6	73.2
	3206	18	.6	.6	73.8
	3207	18	.6	.6	74.4
	3208	18	.6	.6	75.0
	3209	18	.6	.6	75.6
	3210	18	.6	.6	76.2
	3211	18	.6	.6	76.8
	3213	18	.6	.6	77.4
	3214	18	.6	.6	78.0
	3215	18	.6	.6	78.6
	3216	18	.6	.6	79.2
	3217	18	.6	.6	79.8
	3218	18	.6	.6	80.4
	3219	18	.6	.6	81.0
	3220	18	.6	.6	81.5
	3221	18	.6	.6	82.1
	3223	18	.6	.6	82.7
	3224	18	.6	.6	83.3

	3226	18	.6	.6	83.9
	3227	18	.6	.6	84.5
	3228	18	.6	.6	85.1
	3229	18	.6	.6	85.7
	3230	18	.6	.6	86.3
	3231	18	.6	.6	86.9
	3232	18	.6	.6	87.5
	3233	18	.6	.6	88.1
	3234	18	.6	.6	88.7
	3235	18	.6	.6	89.3
	3236	18	.6	.6	89.9
	3237	18	.6	.6	90.5
	3238	18	.6	.6	91.1
	3239	18	.6	.6	91.7
	3240	18	.6	.6	92.3
	3241	18	.6	.6	92.9
	3242	18	.6	.6	93.5
	3243	18	.6	.6	94.0
	3245	18	.6	.6	94.6
	3246	18	.6	.6	95.2
	3247	18	.6	.6	95.8
	3250	18	.6	.6	96.4
	3252	18	.6	.6	97.0
	3254	18	.6	.6	97.6
	3256	18	.6	.6	98.2
	3258	18	.6	.6	98.8
	3260	18	.6	.6	99.4
	3264	18	.6	.6	100.0
	Total	3024	100.0	100.0	

```
DESCRIPTIVES VARIABLES=BedCount
  /STATISTICS=MEAN SUM MIN MAX.
```

Descriptives

Notes

Output Created	30-SEP-2017 14:01:03

Comments		
Input	Data	C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-1.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=BedCount /STATISTICS=MEAN SUM MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean
Beds in Facility	3024	0	240	329476	108.95
Valid N (listwise)	3024				

```
DATASET COPY  Jan2017.
DATASET ACTIVATE  Jan2017.
FILTER OFF.
USE ALL.
SELECT IF (AsOfDate = DATE.DMY(31,1,2017)).
EXECUTE.
DATASET ACTIVATE  DataSet1.
DATASET ACTIVATE Jan2017.
SUMMARIZE
  /TABLES=BedCount BY Facility
  /FORMAT=VALIDLIST NOCASENUM TOTAL
  /TITLE='Case Summaries'
  /MISSING=VARIABLE
  /CELLS=COUNT SUM MIN MAX.
```

Summarize

Notes

Output Created		30-SEP-2017 14:08:16
Comments		
Input	Active Dataset	Jan2017
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	168
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.
Syntax		SUMMARIZE /TABLES=BedCount BY Facility /FORMAT=VALIDLIST NOCASENUM TOTAL /TITLE='Case Summaries' /MISSING=VARIABLE /CELLS=COUNT SUM MIN MAX.
Resources	Processor Time	00:00:00.05
	Elapsed Time	00:00:00.05

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Beds in Facility * Facility Identifier	168	100.0%	0	0.0%	168	100.0%

Case Summaries

				Beds in Facility
Facility Identifier	301	1		71
		Total	N	1
			Sum	71
			Minimum	71
			Maximum	71
	303	1		76
		Total	N	1
			Sum	76
			Minimum	76
			Maximum	76
	304	1		80
		Total	N	1
			Sum	80
			Minimum	80
			Maximum	80
	350	1		119
		Total	N	1
			Sum	119
			Minimum	119
			Maximum	119
	405	1		120
		Total	N	1
			Sum	120
			Minimum	120
			Maximum	120
	406	1		105
		Total	N	1
			Sum	105

		Minimum	105
		Maximum	105
407	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
409	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
410	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
411	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
413	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
414	1		119
	Total	N	1
		Sum	119
		Minimum	119
		Maximum	119
415	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120

416	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
417	1		77
	Total	N	1
		Sum	77
		Minimum	77
		Maximum	77
418	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
419	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
420	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
421	1		167
	Total	N	1
		Sum	167
		Minimum	167
		Maximum	167
422	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
423	1		59
	Total	N	1

		Sum	59
		Minimum	59
		Maximum	59
424	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
425	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
426	1		97
	Total	N	1
		Sum	97
		Minimum	97
		Maximum	97
427	1		180
	Total	N	1
		Sum	180
		Minimum	180
		Maximum	180
428	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
429	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
430	1		120
	Total	N	1
		Sum	120
		Minimum	120

		Maximum	120
432	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
433	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
434	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
435	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
436	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
437	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
438	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
439	1		180

	Total	N	1
		Sum	180
		Minimum	180
		Maximum	180
440	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
441	1		82
	Total	N	1
		Sum	82
		Minimum	82
		Maximum	82
442	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
443	1		180
	Total	N	1
		Sum	180
		Minimum	180
		Maximum	180
444	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
445	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
446	1		93
	Total	N	1
		Sum	93

		Minimum	93
		Maximum	93
447	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
448	1		150
	Total	N	1
		Sum	150
		Minimum	150
		Maximum	150
450	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
451	1		240
	Total	N	1
		Sum	240
		Minimum	240
		Maximum	240
452	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
453	1		180
	Total	N	1
		Sum	180
		Minimum	180
		Maximum	180
462	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120

463	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
464	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
465	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
466	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
468	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
481	1		58
	Total	N	1
		Sum	58
		Minimum	58
		Maximum	58
501	1		140
	Total	N	1
		Sum	140
		Minimum	140
		Maximum	140
502	1		62
	Total	N	1

		Sum	62
		Minimum	62
		Maximum	62
503	1		96
	Total	N	1
		Sum	96
		Minimum	96
		Maximum	96
504	1		66
	Total	N	1
		Sum	66
		Minimum	66
		Maximum	66
505	1		134
	Total	N	1
		Sum	134
		Minimum	134
		Maximum	134
507	1		70
	Total	N	1
		Sum	70
		Minimum	70
		Maximum	70
508	1		98
	Total	N	1
		Sum	98
		Minimum	98
		Maximum	98
513	1		108
	Total	N	1
		Sum	108
		Minimum	108
		Maximum	108
514	1		117
	Total	N	1
		Sum	117
		Minimum	117

		Maximum	117
515	1		116
	Total	N	1
		Sum	116
		Minimum	116
		Maximum	116
517	1		121
	Total	N	1
		Sum	121
		Minimum	121
		Maximum	121
518	1		127
	Total	N	1
		Sum	127
		Minimum	127
		Maximum	127
519	1		63
	Total	N	1
		Sum	63
		Minimum	63
		Maximum	63
520	1		107
	Total	N	1
		Sum	107
		Minimum	107
		Maximum	107
521	1		96
	Total	N	1
		Sum	96
		Minimum	96
		Maximum	96
524	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
526	1		127

	Total	N	1
		Sum	127
		Minimum	127
		Maximum	127
529	1		111
	Total	N	1
		Sum	111
		Minimum	111
		Maximum	111
531	1		82
	Total	N	1
		Sum	82
		Minimum	82
		Maximum	82
536	1		145
	Total	N	1
		Sum	145
		Minimum	145
		Maximum	145
540	1		72
	Total	N	1
		Sum	72
		Minimum	72
		Maximum	72
541	1		111
	Total	N	1
		Sum	111
		Minimum	111
		Maximum	111
542	1		108
	Total	N	1
		Sum	108
		Minimum	108
		Maximum	108
543	1		82
	Total	N	1
		Sum	82

		Minimum	82
		Maximum	82
546	1		134
	Total	N	1
		Sum	134
		Minimum	134
		Maximum	134
547	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
549	1		69
	Total	N	1
		Sum	69
		Minimum	69
		Maximum	69
552	1		80
	Total	N	1
		Sum	80
		Minimum	80
		Maximum	80
556	1		119
	Total	N	1
		Sum	119
		Minimum	119
		Maximum	119
558	1		96
	Total	N	1
		Sum	96
		Minimum	96
		Maximum	96
559	1		49
	Total	N	1
		Sum	49
		Minimum	49
		Maximum	49

560	1		92
	Total	N	1
		Sum	92
		Minimum	92
		Maximum	92
562	1		98
	Total	N	1
		Sum	98
		Minimum	98
		Maximum	98
563	1		82
	Total	N	1
		Sum	82
		Minimum	82
		Maximum	82
564	1		76
	Total	N	1
		Sum	76
		Minimum	76
		Maximum	76
565	1		72
	Total	N	1
		Sum	72
		Minimum	72
		Maximum	72
566	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
1078	1		90
	Total	N	1
		Sum	90
		Minimum	90
		Maximum	90
1079	1		60
	Total	N	1

		Sum	60
		Minimum	60
		Maximum	60
1080	1		90
	Total	N	1
		Sum	90
		Minimum	90
		Maximum	90
3101	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3102	1		159
	Total	N	1
		Sum	159
		Minimum	159
		Maximum	159
3103	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3104	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3105	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3106	1		120
	Total	N	1
		Sum	120
		Minimum	120

		Maximum	120
3107	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3108	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3109	1		167
	Total	N	1
		Sum	167
		Minimum	167
		Maximum	167
3110	1		116
	Total	N	1
		Sum	116
		Minimum	116
		Maximum	116
3111	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3112	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3113	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3114	1		116

	Total	N	1
		Sum	116
		Minimum	116
		Maximum	116
3115	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3116	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3117	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3118	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3119	1		81
	Total	N	1
		Sum	81
		Minimum	81
		Maximum	81
3120	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3121	1		120
	Total	N	1
		Sum	120

		Minimum	120
		Maximum	120
3200	1		112
	Total	N	1
		Sum	112
		Minimum	112
		Maximum	112
3201	1		222
	Total	N	1
		Sum	222
		Minimum	222
		Maximum	222
3202	1		101
	Total	N	1
		Sum	101
		Minimum	101
		Maximum	101
3203	1		102
	Total	N	1
		Sum	102
		Minimum	102
		Maximum	102
3204	1		117
	Total	N	1
		Sum	117
		Minimum	117
		Maximum	117
3205	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3206	1		90
	Total	N	1
		Sum	90
		Minimum	90
		Maximum	90

3207	1		114
	Total	N	1
		Sum	114
		Minimum	114
		Maximum	114
3208	1		88
	Total	N	1
		Sum	88
		Minimum	88
		Maximum	88
3209	1		88
	Total	N	1
		Sum	88
		Minimum	88
		Maximum	88
3210	1		190
	Total	N	1
		Sum	190
		Minimum	190
		Maximum	190
3211	1		111
	Total	N	1
		Sum	111
		Minimum	111
		Maximum	111
3213	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
3214	1		84
	Total	N	1
		Sum	84
		Minimum	84
		Maximum	84
3215	1		77
	Total	N	1

		Sum	77
		Minimum	77
		Maximum	77
3216	1		174
	Total	N	1
		Sum	174
		Minimum	174
		Maximum	174
3217	1		170
	Total	N	1
		Sum	170
		Minimum	170
		Maximum	170
3218	1		130
	Total	N	1
		Sum	130
		Minimum	130
		Maximum	130
3219	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
3220	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3221	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
3223	1		121
	Total	N	1
		Sum	121
		Minimum	121

		Maximum	121
3224	1		104
	Total	N	1
		Sum	104
		Minimum	104
		Maximum	104
3226	1		123
	Total	N	1
		Sum	123
		Minimum	123
		Maximum	123
3227	1		133
	Total	N	1
		Sum	133
		Minimum	133
		Maximum	133
3228	1		48
	Total	N	1
		Sum	48
		Minimum	48
		Maximum	48
3229	1		46
	Total	N	1
		Sum	46
		Minimum	46
		Maximum	46
3230	1		85
	Total	N	1
		Sum	85
		Minimum	85
		Maximum	85
3231	1		75
	Total	N	1
		Sum	75
		Minimum	75
		Maximum	75
3232	1		90

	Total	N	1
		Sum	90
		Minimum	90
		Maximum	90
3233	1		50
	Total	N	1
		Sum	50
		Minimum	50
		Maximum	50
3234	1		70
	Total	N	1
		Sum	70
		Minimum	70
		Maximum	70
3235	1		44
	Total	N	1
		Sum	44
		Minimum	44
		Maximum	44
3236	1		125
	Total	N	1
		Sum	125
		Minimum	125
		Maximum	125
3237	1		30
	Total	N	1
		Sum	30
		Minimum	30
		Maximum	30
3238	1		60
	Total	N	1
		Sum	60
		Minimum	60
		Maximum	60
3239	1		65
	Total	N	1
		Sum	65

		Minimum	65
		Maximum	65
3240	1		96
	Total	N	1
		Sum	96
		Minimum	96
		Maximum	96
3241	1		71
	Total	N	1
		Sum	71
		Minimum	71
		Maximum	71
3242	1		90
	Total	N	1
		Sum	90
		Minimum	90
		Maximum	90
3243	1		40
	Total	N	1
		Sum	40
		Minimum	40
		Maximum	40
3245	1		100
	Total	N	1
		Sum	100
		Minimum	100
		Maximum	100
3246	1		140
	Total	N	1
		Sum	140
		Minimum	140
		Maximum	140
3247	1		62
	Total	N	1
		Sum	62
		Minimum	62
		Maximum	62

3250	1		159
	Total	N	1
		Sum	159
		Minimum	159
		Maximum	159
3252	1		104
	Total	N	1
		Sum	104
		Minimum	104
		Maximum	104
3254	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3256	1		194
	Total	N	1
		Sum	194
		Minimum	194
		Maximum	194
3258	1		120
	Total	N	1
		Sum	120
		Minimum	120
		Maximum	120
3260	1		122
	Total	N	1
		Sum	122
		Minimum	122
		Maximum	122
3264	1		148
	Total	N	1
		Sum	148
		Minimum	148
		Maximum	148
Total	N		168
	Sum		18343

	Minimum	30
	Maximum	240

```
SUMMARIZE
  /TABLES=BedCount
  /FORMAT=VALIDLIST NOCASENUM TOTAL
  /TITLE='Case Summaries'
  /MISSING=VARIABLE
  /CELLS=COUNT SUM MIN MAX.
```

Summarize

Notes

Output Created		30-SEP-2017 14:12:15
Comments		
Input	Active Dataset	Jan2017
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	168
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.

Syntax		SUMMARIZE /TABLES=BedCount /FORMAT=VALIDLIST NOCASENUM TOTAL /TITLE='Case Summaries' /MISSING=VARIABLE /CELLS=COUNT SUM MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Beds in Facility	168	100.0%	0	0.0%	168	100.0%

Case Summaries

	Beds in Facility
1	71
2	76
3	80
4	119
5	120
6	105
7	120
8	120
9	120
10	120
11	120
12	119
13	120
14	120
15	77
16	120
17	120

18	120
19	167
20	120
21	59
22	120
23	120
24	97
25	180
26	120
27	120
28	120
29	120
30	120
31	120
32	120
33	120
34	120
35	120
36	180
37	120
38	82
39	120
40	180
41	120
42	60
43	93
44	120
45	150
46	120
47	240
48	120
49	180
50	120
51	120
52	120
53	120
54	120

55	120
56	58
57	140
58	62
59	96
60	66
61	134
62	70
63	98
64	108
65	117
66	116
67	121
68	127
69	63
70	107
71	96
72	60
73	127
74	111
75	82
76	145
77	72
78	111
79	108
80	82
81	134
82	120
83	69
84	80
85	119
86	96
87	49
88	92
89	98
90	82
91	76

92	72
93	120
94	90
95	60
96	90
97	120
98	159
99	120
100	120
101	120
102	120
103	120
104	120
105	167
106	116
107	120
108	120
109	120
110	116
111	120
112	120
113	120
114	120
115	81
116	120
117	120
118	112
119	222
120	101
121	102
122	117
123	120
124	90
125	114
126	88
127	88
128	190

129	111
130	60
131	84
132	77
133	174
134	170
135	130
136	60
137	120
138	60
139	121
140	104
141	123
142	133
143	48
144	46
145	85
146	75
147	90
148	50
149	70
150	44
151	125
152	30
153	60
154	65
155	96
156	71
157	90
158	40
159	100
160	140
161	62
162	159
163	104
164	120
165	194

166		120
167		122
168		148
Total	N	168
	Sum	18343
	Minimum	30
	Maximum	240

```
SUMMARIZE
  /TABLES=BedCount
  /FORMAT=VALIDLIST NOCASENUM TOTAL
  /TITLE='Case Summaries'
  /MISSING=VARIABLE
  /CELLS=COUNT SUM MIN MAX MEAN MEDIAN.
```

Summarize

Notes

Output Created		30-SEP-2017 14:13:21
Comments		
Input	Active Dataset	Jan2017
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	168
Missing Value Handling	Definition of Missing	For each dependent variable in a table, user-defined missing values for the dependent and all grouping variables are treated as missing.
	Cases Used	Cases used for each table have no missing values in any independent variable, and not all dependent variables have missing values.

Syntax		SUMMARIZE /TABLES=BedCount /FORMAT=VALIDLIST NOCASENUM TOTAL /TITLE='Case Summaries' /MISSING=VARIABLE /CELLS=COUNT SUM MIN MAX MEAN MEDIAN.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Beds in Facility	168	100.0%	0	0.0%	168	100.0%

Case Summaries

	Beds in Facility
1	71
2	76
3	80
4	119
5	120
6	105
7	120
8	120
9	120
10	120
11	120
12	119
13	120
14	120
15	77
16	120

17	120
18	120
19	167
20	120
21	59
22	120
23	120
24	97
25	180
26	120
27	120
28	120
29	120
30	120
31	120
32	120
33	120
34	120
35	120
36	180
37	120
38	82
39	120
40	180
41	120
42	60
43	93
44	120
45	150
46	120
47	240
48	120
49	180
50	120
51	120
52	120
53	120

54	120
55	120
56	58
57	140
58	62
59	96
60	66
61	134
62	70
63	98
64	108
65	117
66	116
67	121
68	127
69	63
70	107
71	96
72	60
73	127
74	111
75	82
76	145
77	72
78	111
79	108
80	82
81	134
82	120
83	69
84	80
85	119
86	96
87	49
88	92
89	98
90	82

91	76
92	72
93	120
94	90
95	60
96	90
97	120
98	159
99	120
100	120
101	120
102	120
103	120
104	120
105	167
106	116
107	120
108	120
109	120
110	116
111	120
112	120
113	120
114	120
115	81
116	120
117	120
118	112
119	222
120	101
121	102
122	117
123	120
124	90
125	114
126	88
127	88

128	190
129	111
130	60
131	84
132	77
133	174
134	170
135	130
136	60
137	120
138	60
139	121
140	104
141	123
142	133
143	48
144	46
145	85
146	75
147	90
148	50
149	70
150	44
151	125
152	30
153	60
154	65
155	96
156	71
157	90
158	40
159	100
160	140
161	62
162	159
163	104
164	120

165		194
166		120
167		122
168		148
Total	N	168
	Sum	18343
	Minimum	30
	Maximum	240
	Mean	109.18
	Median	120.00

```
DATASET ACTIVATE DataSet1.
COMPUTE HIT=0.
EXECUTE.
DO IF (EHR = 1 | EHR = 2).
RECODE HIT (0=1).
END IF.
EXECUTE.
DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\Scott H\Documents\A Dissertation
SLH\Analysis\Final '+
    'Analysis\Jan2016-June2017Final Data Set-1.sav'
  /COMPRESSED.

Warning # 5334.  Command name: SAVE
The SAVE command has succeeded.  However, due to contention for the
specified
file, the data have been saved to a file with a different name.
Saved to C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final
Analysis\Jan2016-June2017Final Data Set-1_1.sav.
DATASET COPY  June2017.
DATASET ACTIVATE  June2017.
FILTER OFF.
USE ALL.
SELECT IF (AsOfDate = DATE.DMY(30,6,2017)).
EXECUTE.
DATASET ACTIVATE  DataSet1.
DATASET ACTIVATE June2017.
FREQUENCIES VARIABLES=EHR
  /ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		30-SEP-2017 15:13:02
Comments		
Input	Active Dataset	June2017

	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	168
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=EHR /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.01

[June2017]

Statistics

EHR Level

N	Valid	168
	Missing	0

EHR Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	70	41.7	41.7	41.7
	1	58	34.5	34.5	76.2
	2	40	23.8	23.8	100.0
	Total	168	100.0	100.0	

```
DATASET ACTIVATE DataSet1.
GLM Engaged StaffRetRate TotTurnoverPct FiveStarAll FiveStarQuality
FailedRevtIndicator
    ComplaintTagPCT FacilityDefIndex RTHPCT PctOT BDebtPct PctBudget BY
EHR WITH SkilledPctMix
  /METHOD=SSTYPE(3)
  /INTERCEPT=INCLUDE
  /SAVE=RESID ZRESID
  /EMMEANS=TABLES(EHR) WITH(SkilledPctMix=MEAN) COMPARE ADJ(BONFERRONI)
```

```
  /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY
  /CRITERIA=ALPHA(.05)
  /DESIGN=SkilledPctMix EHR.
```

General Linear Model

Notes

Output Created		30-SEP-2017 18:22:19
Comments		
Input	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.
Syntax		GLM Engaged StaffRetRate TotTurnoverPct FiveStarAll FiveStarQuality FailedRevtIndicator ComplaintTagPCT FacilityDefIndex RTHPCT PctOT BDebtPct PctBudget BY EHR WITH SkilledPctMix /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /SAVE=RESID ZRESID /EMMEANS=TABLES(EHR) WITH(SkilledPctMix=MEAN) COMPARE ADJ(BONFERRONI) /PRINT=DESCRIPTIVE ETASQ HOMOGENEITY /CRITERIA=ALPHA(.05) /DESIGN=SkilledPctMix EHR.

Resources	Processor Time	00:00:00.11
	Elapsed Time	00:00:00.14
Variables Created or Modified	RES_1	Residual for Engaged
	RES_2	Residual for StaffRetRate
	RES_3	Residual for TotTurnoverPct
	RES_4	Residual for FiveStarAll
	RES_5	Residual for FiveStarQuality
	RES_6	Residual for FailedRevtIndicator
	RES_7	Residual for ComplaintTagPCT
	RES_8	Residual for FacilityDefIndex
	RES_9	Residual for RTHPCT
	RES_10	Residual for PctOT
	RES_11	Residual for BDebtPct
	RES_12	Residual for PctBudget
	ZRE_1	Standardized Residual for Engaged
	ZRE_2	Standardized Residual for StaffRetRate
	ZRE_3	Standardized Residual for TotTurnoverPct
	ZRE_4	Standardized Residual for FiveStarAll
	ZRE_5	Standardized Residual for FiveStarQuality
	ZRE_6	Standardized Residual for FailedRevtIndicator
	ZRE_7	Standardized Residual for ComplaintTagPCT
	ZRE_8	Standardized Residual for FacilityDefIndex
	ZRE_9	Standardized Residual for RTHPCT
	ZRE_10	Standardized Residual for PctOT
	ZRE_11	Standardized Residual for BDebtPct

	ZRE_12	Standardized Residual for PctBudget

[DataSet1] C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-1_1.sav

Between-Subjects Factors

		N
EHR Level	0	1560
	1	992
	2	472

Descriptive Statistics

	EHR Level	Mean	Std. Deviation	N
Emplyee Engagement Score	0	31.9167%	11.43594%	1560
	1	34.5927%	13.62721%	992
	2	35.5975%	11.95635%	472
	Total	33.3690%	12.36730%	3024
Staff Retention Rate	0	.6004	.11933	1560
	1	.6016	.11086	992
	2	.5548	.12323	472
	Total	.5937	.11840	3024
Total Staff Turnover %	0	.4196	.10947	1560
	1	.4150	.10863	992
	2	.3945	.10441	472
	Total	.4142	.10873	3024
CMS 5 Star	0	2.34	1.315	1560
	1	2.00	1.200	992
	2	2.38	.952	472
	Total	2.24	1.238	3024
CMS 5 Star Quality	0	3.58	1.340	1560
	1	2.99	1.272	992
	2	4.07	1.092	472
	Total	3.46	1.334	3024
Failed Revisit	0	.08	.269	1560
	1	.05	.213	992
	2	.07	.259	472

	Total	.07	.250	3024
Complaint Tags %	0	25.0809%	25.07668%	1560
	1	14.7941%	24.21814%	992
	2	24.2020%	25.92104%	472
	Total	21.5692%	25.37258%	3024
Facility Defficiency Index	0	1.6515	1.06399	1560
	1	1.6374	1.17269	992
	2	1.7206	.92870	472
	Total	1.6577	1.08157	3024
Return to Hospital %	0	17.5250%	4.68279%	1560
	1	15.5373%	4.39711%	992
	2	16.5657%	4.06719%	472
	Total	16.7232%	4.58493%	3024
Over Time %	0	6.8210%	2.80737%	1560
	1	5.3806%	2.74375%	992
	2	6.5361%	2.96584%	472
	Total	6.3040%	2.88601%	3024
Bad Debt %	0	.1975	4.20034	1560
	1	.5979	8.91368	992
	2	.1343	.51422	472
	Total	.3190	5.93505	3024
Revenue % of Budget	0	845.7748%	29840.30509%	1560
	1	-2.0290%	214.89982%	992
	2	24.9556%	451.23395%	472
	Total	439.5420%	21434.46232%	3024

Box's Test of Equality of Covariance Matrices[a]

Box's M	15651.908
F	99.615
df1	156
df2	6588337.528
Sig.	.000

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.[a]

a. Design: Intercept + SkilledPctMix + EHR

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.970	8008.577[b]	12.000	3009.000	.000
	Wilks' Lambda	.030	8008.577[b]	12.000	3009.000	.000
	Hotelling's Trace	31.938	8008.577[b]	12.000	3009.000	.000
	Roy's Largest Root	31.938	8008.577[b]	12.000	3009.000	.000
SkilledPctMix	Pillai's Trace	.070	18.967[b]	12.000	3009.000	.000
	Wilks' Lambda	.930	18.967[b]	12.000	3009.000	.000
	Hotelling's Trace	.076	18.967[b]	12.000	3009.000	.000
	Roy's Largest Root	.076	18.967[b]	12.000	3009.000	.000
EHR	Pillai's Trace	.266	38.534	24.000	6020.000	.000
	Wilks' Lambda	.750	38.744[b]	24.000	6018.000	.000
	Hotelling's Trace	.311	38.954	24.000	6016.000	.000
	Roy's Largest Root	.201	50.337[c]	12.000	3010.000	.000

Multivariate Tests[a]

Effect		Partial Eta Squared
Intercept	Pillai's Trace	.970
	Wilks' Lambda	.970
	Hotelling's Trace	.970
	Roy's Largest Root	.970
SkilledPctMix	Pillai's Trace	.070
	Wilks' Lambda	.070
	Hotelling's Trace	.070
	Roy's Largest Root	.070
EHR	Pillai's Trace	.133
	Wilks' Lambda	.134
	Hotelling's Trace	.134
	Roy's Largest Root	.167

a. Design: Intercept + SkilledPctMix + EHR

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Emplyee Engagement Score	13.162	2	3021	.000
Staff Retention Rate	4.729	2	3021	.009
Total Staff Turnover %	1.042	2	3021	.353
CMS 5 Star	44.799	2	3021	.000
CMS 5 Star Quality	37.460	2	3021	.000
Failed Revisit	19.752	2	3021	.000
Complaint Tags %	8.589	2	3021	.000
Facility Defficiency Index	3.931	2	3021	.020
Return to Hospital %	7.290	2	3021	.001
Over Time %	.427	2	3021	.653
Bad Debt %	3.547	2	3021	.029
Revenue % of Budget	1.776	2	3021	.170

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.[a]

a. Design: Intercept + SkilledPctMix + EHR

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Emplyee Engagement Score	7676.989[a]	3	2558.996	16.997	.000	.017
	Staff Retention Rate	.900[b]	3	.300	21.855	.000	.021
	Total Staff Turnover %	.302[c]	3	.101	8.577	.000	.008
	CMS 5 Star	261.317[d]	3	87.106	60.188	.000	.056
	CMS 5 Star Quality	600.084[e]	3	200.028	126.398	.000	.112
	Failed Revisit	2.109[f]	3	.703	11.337	.000	.011
	Complaint Tags %	68480.976[g]	3	22826.992	36.715	.000	.035
	Facility Defficiency Index	35.925[h]	3	11.975	10.332	.000	.010
	Return to Hospital %	2415.696[i]	3	805.232	39.779	.000	.038

	Over Time %	1472.856[j]	3	490.952	62.545	.000	.058
	Bad Debt %	119.915[k]	3	39.972	1.135	.334	.001
	Revenue % of Budget	1473611029.000[l]	3	491203676.400	1.069	.361	.001
Intercept	Emplyee Engagement Score	654103.211	1	654103.211	4344.469	.000	.590
	Staff Retention Rate	197.864	1	197.864	14406.608	.000	.827
	Total Staff Turnover %	104.357	1	104.357	8892.892	.000	.746
	CMS 5 Star	1848.353	1	1848.353	1277.168	.000	.297
	CMS 5 Star Quality	5558.593	1	5558.593	3512.478	.000	.538
	Failed Revisit	.288	1	.288	4.639	.031	.002
	Complaint Tags %	252276.538	1	252276.538	405.764	.000	.118
	Facility Defficiency Index	2089.168	1	2089.168	1802.458	.000	.374
	Return to Hospital %	164145.795	1	164145.795	8108.948	.000	.729
	Over Time %	26878.988	1	26878.988	3424.233	.000	.531
	Bad Debt %	84.757	1	84.757	2.406	.121	.001
	Revenue % of Budget	1132740559.000	1	1132740559.000	2.466	.116	.001
SkilledPctMix	Emplyee Engagement Score	556.997	1	556.997	3.700	.055	.001
	Staff Retention Rate	.054	1	.054	3.897	.048	.001
	Total Staff Turnover %	.072	1	.072	6.177	.013	.002
	CMS 5 Star	178.457	1	178.457	123.310	.000	.039
	CMS 5 Star Quality	185.419	1	185.419	117.167	.000	.037
	Failed Revisit	1.519	1	1.519	24.503	.000	.008
	Complaint Tags %	436.289	1	436.289	.702	.402	.000
	Facility Defficiency Index	33.587	1	33.587	28.978	.000	.010
	Return to Hospital %	5.939	1	5.939	.293	.588	.000
	Over Time %	184.559	1	184.559	23.512	.000	.008
	Bad Debt %	3.649	1	3.649	.104	.748	.000
	Revenue % of Budget	941618497.100	1	941618497.100	2.050	.152	.001
EHR	Emplyee Engagement Score	6336.218	2	3168.109	21.042	.000	.014
	Staff Retention Rate	.898	2	.449	32.710	.000	.021
	Total Staff Turnover %	.150	2	.075	6.386	.002	.004

	CMS 5 Star	68.457	2	34.229	23.651	.000	.015
	CMS 5 Star Quality	295.851	2	147.926	93.474	.000	.058
	Failed Revisit	.603	2	.302	4.864	.008	.003
	Complaint Tags %	66669.554	2	33334.777	53.616	.000	.034
	Facility Defficiency Index	9.799	2	4.900	4.227	.015	.003
	Return to Hospital %	2409.333	2	1204.667	59.512	.000	.038
	Over Time %	1356.712	2	678.356	86.419	.000	.054
	Bad Debt %	109.235	2	54.618	1.551	.212	.001
	Revenue % of Budget	460679283.400	2	230339641.700	.501	.606	.000
Error	Emplyee Engagement Score	454691.154	3020	150.560			
	Staff Retention Rate	41.478	3020	.014			
	Total Staff Turnover %	35.439	3020	.012			
	CMS 5 Star	4370.627	3020	1.447			
	CMS 5 Star Quality	4779.233	3020	1.583			
	Failed Revisit	187.264	3020	.062			
	Complaint Tags %	1877629.576	3020	621.732			
	Facility Defficiency Index	3500.379	3020	1.159			
	Return to Hospital %	61132.506	3020	20.243			
	Over Time %	23705.902	3020	7.850			
	Bad Debt %	106364.710	3020	35.220			
	Revenue % of Budget	1387401946000.000	3020	459404617.800			
Total	Emplyee Engagement Score	3829572.000	3024				
	Staff Retention Rate	1108.176	3024				
	Total Staff Turnover %	554.524	3024				
	CMS 5 Star	19757.000	3024				
	CMS 5 Star Quality	41595.000	3024				
	Failed Revisit	203.000	3024				
	Complaint Tags %	3352965.202	3024				
	Facility Defficiency Index	11845.849	3024				
	Return to Hospital %	909257.857	3024				

	Over Time %	145353.680	3024				
	Bad Debt %	106792.330	3024				
	Revenue % of Budget	1389459785000.000	3024				
Corrected Total	Emplyee Engagement Score	462368.143	3023				
	Staff Retention Rate	42.378	3023				
	Total Staff Turnover %	35.741	3023				
	CMS 5 Star	4631.944	3023				
	CMS 5 Star Quality	5379.317	3023				
	Failed Revisit	189.373	3023				
	Complaint Tags %	1946110.552	3023				
	Facility Defficiency Index	3536.304	3023				
	Return to Hospital %	63548.202	3023				
	Over Time %	25178.759	3023				
	Bad Debt %	106484.625	3023				
	Revenue % of Budget	1388875557000.000	3023				

a. R Squared = .017 (Adjusted R Squared = .016)

b. R Squared = .021 (Adjusted R Squared = .020)

c. R Squared = .008 (Adjusted R Squared = .007)

d. R Squared = .056 (Adjusted R Squared = .055)

e. R Squared = .112 (Adjusted R Squared = .111)

f. R Squared = .011 (Adjusted R Squared = .010)

g. R Squared = .035 (Adjusted R Squared = .034)

h. R Squared = .010 (Adjusted R Squared = .009)

i. R Squared = .038 (Adjusted R Squared = .037)

j. R Squared = .058 (Adjusted R Squared = .058)

k. R Squared = .001 (Adjusted R Squared = .000)

l. R Squared = .001 (Adjusted R Squared = .000)

Estimated Marginal Means

EHR Level

Estimates

Dependent Variable	EHR Level	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Emplyee Engagement Score	0	31.965[a]	.312	31.354	32.576
	1	34.660[a]	.391	33.893	35.426
	2	35.296[a]	.586	34.147	36.446
Staff Retention Rate	0	.601[a]	.003	.595	.607
	1	.602[a]	.004	.595	.610
	2	.552[a]	.006	.541	.563
Total Staff Turnover %	0	.419[a]	.003	.414	.424
	1	.414[a]	.003	.407	.421
	2	.398[a]	.005	.388	.408
CMS 5 Star	0	2.372[a]	.031	2.312	2.432
	1	2.038[a]	.038	1.963	2.113
	2	2.205[a]	.057	2.092	2.317
CMS 5 Star Quality	0	3.604[a]	.032	3.542	3.667
	1	3.028[a]	.040	2.950	3.107
	2	3.894[a]	.060	3.776	4.012
Failed Revisit	0	.081[a]	.006	.068	.093
	1	.051[a]	.008	.035	.066
	2	.056[a]	.012	.033	.080
Complaint Tags %	0	25.124[a]	.633	23.882	26.366
	1	14.853[a]	.795	13.295	16.412
	2	23.936[a]	1.191	21.600	26.271
Facility Defficiency Index	0	1.640[a]	.027	1.586	1.693
	1	1.621[a]	.034	1.554	1.688
	2	1.795[a]	.051	1.694	1.895
Return to Hospital %	0	17.520[a]	.114	17.296	17.744
	1	15.530[a]	.143	15.249	15.812
	2	16.597[a]	.215	16.175	17.018
Over Time %	0	6.793[a]	.071	6.653	6.933
	1	5.342[a]	.089	5.167	5.517
	2	6.709[a]	.134	6.447	6.972
Bad Debt %	0	.194[a]	.151	-.102	.489
	1	.592[a]	.189	.222	.963
	2	.159[a]	.283	-.397	.714
Revenue % of Budget	0	782.541[a]	544.464	-285.016	1850.099
	1	-88.834[a]	683.217	-1428.452	1250.784

	2	416.386[a]	1023.752	-1590.936	2423.707

a. Covariates appearing in the model are evaluated at the following values: % Skilled Patients = 19.6091%.

Pairwise Comparisons

Dependent Variable	(I) EHR Level	(J) EHR Level	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
Emplyee Engagement Score	0	1	-2.694*	.498	.000	-3.888	-1.500
		2	-3.331*	.670	.000	-4.935	-1.727
	1	0	2.694*	.498	.000	1.500	3.888
		2	-.637	.712	1.000	-2.343	1.069
	2	0	3.331*	.670	.000	1.727	4.935
		1	.637	.712	1.000	-1.069	2.343
Staff Retention Rate	0	1	-.001	.005	1.000	-.013	.010
		2	.049*	.006	.000	.034	.064
	1	0	.001	.005	1.000	-.010	.013
		2	.050*	.007	.000	.034	.067
	2	0	-.049*	.006	.000	-.064	-.034
		1	-.050*	.007	.000	-.067	-.034
Total Staff Turnover %	0	1	.005	.004	.809	-.006	.015
		2	.021*	.006	.001	.007	.035
	1	0	-.005	.004	.809	-.015	.006
		2	.016*	.006	.029	.001	.031
	2	0	-.021*	.006	.001	-.035	-.007
		1	-.016*	.006	.029	-.031	-.001
CMS 5 Star	0	1	.335*	.049	.000	.218	.452
		2	.168*	.066	.032	.011	.325
	1	0	-.335*	.049	.000	-.452	-.218
		2	-.167	.070	.051	-.334	.000
	2	0	-.168*	.066	.032	-.325	-.011
		1	.167	.070	.051	.000	.334
CMS 5 Star Quality	0	1	.576*	.051	.000	.454	.698
		2	-.290*	.069	.000	-.454	-.125
	1	0	-.576*	.051	.000	-.698	-.454
		2	-.866*	.073	.000	-1.041	-.691

	2	0	.290*	.069	.000	.125	.454
		1	.866*	.073	.000	.691	1.041
Failed Revisit	0	1	.030*	.010	.009	.006	.054
		2	.024	.014	.217	-.008	.057
	1	0	-.030*	.010	.009	-.054	-.006
		2	-.005	.014	1.000	-.040	.029
	2	0	-.024	.014	.217	-.057	.008
		1	.005	.014	1.000	-.029	.040
Complaint Tags %	0	1	10.271*	1.013	.000	7.845	12.697
		2	1.188	1.361	1.000	-2.072	4.448
	1	0	-10.271*	1.013	.000	-12.697	-7.845
		2	-9.082*	1.447	.000	-12.549	-5.615
	2	0	-1.188	1.361	1.000	-4.448	2.072
		1	9.082*	1.447	.000	5.615	12.549
Facility Defficiency Index	0	1	.019	.044	1.000	-.086	.123
		2	-.155*	.059	.025	-.296	-.014
	1	0	-.019	.044	1.000	-.123	.086
		2	-.174*	.062	.017	-.323	-.024
	2	0	.155*	.059	.025	.014	.296
		1	.174*	.062	.017	.024	.323
Return to Hospital %	0	1	1.990*	.183	.000	1.552	2.427
		2	.923*	.246	.001	.335	1.511
	1	0	-1.990*	.183	.000	-2.427	-1.552
		2	-1.066*	.261	.000	-1.692	-.441
	2	0	-.923*	.246	.001	-1.511	-.335
		1	1.066*	.261	.000	.441	1.692
Over Time %	0	1	1.451*	.114	.000	1.178	1.723
		2	.084	.153	1.000	-.283	.450
	1	0	-1.451*	.114	.000	-1.723	-1.178
		2	-1.367*	.163	.000	-1.757	-.978
	2	0	-.084	.153	1.000	-.450	.283
		1	1.367*	.163	.000	.978	1.757
Bad Debt %	0	1	-.399	.241	.294	-.976	.178
		2	.035	.324	1.000	-.741	.811
	1	0	.399	.241	.294	-.178	.976
		2	.434	.344	.624	-.391	1.259
	2	0	-.035	.324	1.000	-.811	.741

		1	-.434	.344	.624	-1.259	.391
Revenue % of Budget	0	1	871.375	870.558	.951	-1213.884	2956.635
		2	366.156	1169.898	1.000	-2436.117	3168.429
	1	0	-871.375	870.558	.951	-2956.635	1213.884
		2	-505.219	1244.190	1.000	-3485.446	2475.007
	2	0	-366.156	1169.898	1.000	-3168.429	2436.117
		1	505.219	1244.190	1.000	-2475.007	3485.446

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Multivariate Tests

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pillai's trace	.266	38.534	24.000	6020.000	.000	.133
Wilks' lambda	.750	38.744[a]	24.000	6018.000	.000	.134
Hotelling's trace	.311	38.954	24.000	6016.000	.000	.134
Roy's largest root	.201	50.337[b]	12.000	3010.000	.000	.167

Each F tests the multivariate effect of EHR Level. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Exact statistic

b. The statistic is an upper bound on F that yields a lower bound on the significance level.

Univariate Tests

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.
Emplyee Engagement Score	Contrast	6336.218	2	3168.109	21.042	.000
	Error	454691.154	3020	150.560		
Staff Retention Rate	Contrast	.898	2	.449	32.710	.000
	Error	41.478	3020	.014		
Total Staff Turnover %	Contrast	.150	2	.075	6.386	.002
	Error	35.439	3020	.012		
CMS 5 Star	Contrast	68.457	2	34.229	23.651	.000
	Error	4370.627	3020	1.447		
CMS 5 Star Quality	Contrast	295.851	2	147.926	93.474	.000
	Error	4779.233	3020	1.583		
Failed Revisit	Contrast	.603	2	.302	4.864	.008

	Error	187.264	3020	.062		
Complaint Tags %	Contrast	66669.554	2	33334.777	53.616	.000
	Error	1877629.576	3020	621.732		
Facility Defficiency Index	Contrast	9.799	2	4.900	4.227	.015
	Error	3500.379	3020	1.159		
Return to Hospital %	Contrast	2409.333	2	1204.667	59.512	.000
	Error	61132.506	3020	20.243		
Over Time %	Contrast	1356.712	2	678.356	86.419	.000
	Error	23705.902	3020	7.850		
Bad Debt %	Contrast	109.235	2	54.618	1.551	.212
	Error	106364.710	3020	35.220		
Revenue % of Budget	Contrast	460679283.400	2	230339641.700	.501	.606
	Error	1387401946000.000	3020	459404617.800		

Univariate Tests

Dependent Variable		Partial Eta Squared
Emplyee Engagement Score	Contrast	.014
	Error	
Staff Retention Rate	Contrast	.021
	Error	
Total Staff Turnover %	Contrast	.004
	Error	
CMS 5 Star	Contrast	.015
	Error	
CMS 5 Star Quality	Contrast	.058
	Error	
Failed Revisit	Contrast	.003
	Error	
Complaint Tags %	Contrast	.034
	Error	
Facility Defficiency Index	Contrast	.003
	Error	
Return to Hospital %	Contrast	.038
	Error	
Over Time %	Contrast	.054
	Error	

Bad Debt %	Contrast	.001
	Error	
Revenue % of Budget	Contrast	.000
	Error	

The F tests the effect of EHR Level. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

```
SAVE OUTFILE='C:\Users\Scott H\Documents\A Dissertation
SLH\Analysis\Final '+
    'Analysis\Jan2016-June2017Final Data Set-3wResiduals.sav'
  /COMPRESSED.
SORT CASES  BY EHR.
SPLIT FILE LAYERED BY EHR.
COMPUTE id=$CASENUM.
VARIABLE LABELS  id 'Record ID'.
EXECUTE.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT id
  /METHOD=ENTER Engaged StaffRetRate TotTurnoverPct FiveStarAll
FiveStarQuality FailedRevtIndicator
    ComplaintTagPCT FacilityDefIndex RTHPCT PctOT BDebtPct PctBudget
  /SAVE MAHAL.
```

Regression

Notes

Output Created		30-SEP-2017 18:43:43
Comments		
Input	Data	C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-3wResiduals.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	EHR Level

	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT id /METHOD=ENTER Engaged StaffRetRate TotTurnoverPct FiveStarAll FiveStarQuality FailedRevtIndicator ComplaintTagPCT FacilityDefIndex RTHPCT PctOT BDebtPct PctBudget /SAVE MAHAL.
Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.08
	Memory Required	13184 bytes
	Additional Memory Required for Residual Plots	0 bytes
Variables Created or Modified	MAH_1	Mahalanobis Distance

[DataSet1] C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-3wResiduals.sav

Variables Entered/Removed[a]

EHR Level	Model	Variables Entered	Variables Removed	Method

0	1	Revenue % of Budget, CMS 5 Star Quality, Bad Debt %, Complaint Tags %, Over Time %, Staff Retention Rate, Return to Hospital %, Failed Revisit, Emplyee Engagement Score, Facility Defficiency Index, CMS 5 Star, Total Staff Turnover %[b]	.	Enter
1	1	Revenue % of Budget, Emplyee Engagement Score, Total Staff Turnover %, Bad Debt %, CMS 5 Star Quality, Complaint Tags %, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star, Staff Retention Rate[b]	.	Enter

2	1	Revenue % of Budget, Emplyee Engagement Score, Bad Debt %, Total Staff Turnover %, CMS 5 Star, Complaint Tags %, Staff Retention Rate, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star Quality[b]	.	Enter

a. Dependent Variable: Record ID

b. All requested variables entered.

Model Summary[b]

EHR Level	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
0	1	.214[a]	.046	.039	441.72013
1	1	.244[c]	.060	.048	279.52441
2	1	.609[d]	.370	.354	109.64501

a. Predictors: (Constant), Revenue % of Budget, CMS 5 Star Quality, Bad Debt %, Complaint Tags %, Over Time %, Staff Retention Rate, Return to Hospital %, Failed Revisit, Emplyee Engagement Score, Facility Defficiency Index, CMS 5 Star, Total Staff Turnover %

b. Dependent Variable: Record ID

c. Predictors: (Constant), Revenue % of Budget, Emplyee Engagement Score, Total Staff Turnover %, Bad Debt %, CMS 5 Star Quality, Complaint Tags %, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star, Staff Retention Rate

d. Predictors: (Constant), Revenue % of Budget, Emplyee Engagement Score, Bad Debt %, Total Staff Turnover %, CMS 5 Star, Complaint Tags %, Staff Retention Rate, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star Quality

ANOVA[a]

EHR Level	Model		Sum of Squares	df	Mean Square	F	Sig.
0	1	Regression	14522373.610	12	1210197.801	6.202	.000[b]
		Residual	301845496.400	1547	195116.675		
		Total	316367870.000	1559			
1	1	Regression	4856121.570	12	404676.798	5.179	.000[c]
		Residual	76493086.430	979	78133.898		
		Total	81349208.000	991			
2	1	Regression	3244686.761	12	270390.563	22.491	.000[d]
		Residual	5518111.239	459	12022.029		
		Total	8762798.000	471			

a. Dependent Variable: Record ID

b. Predictors: (Constant), Revenue % of Budget, CMS 5 Star Quality, Bad Debt %, Complaint Tags %, Over Time %, Staff Retention Rate, Return to Hospital %, Failed Revisit, Emplyee Engagement Score, Facility Defficiency Index, CMS 5 Star, Total Staff Turnover %

c. Predictors: (Constant), Revenue % of Budget, Emplyee Engagement Score, Total Staff Turnover %, Bad Debt %, CMS 5 Star Quality, Complaint Tags %, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star, Staff Retention Rate

d. Predictors: (Constant), Revenue % of Budget, Emplyee Engagement Score, Bad Debt %, Total Staff Turnover %, CMS 5 Star, Complaint Tags %, Staff Retention Rate, Failed Revisit, Return to Hospital %, Over Time %, Facility Defficiency Index, CMS 5 Star Quality

Coefficients[a]

			Unstandardized Coefficients		Standardized Coefficients		
EHR Level	Model		B	Std. Error	Beta	t	Sig.
0	1	(Constant)	1826.064	160.670		11.365	.000
		Emplyee Engagement Score	-1.414	1.069	-.036	-1.323	.186
		Staff Retention Rate	-772.925	141.985	-.205	-5.444	.000
		Total Staff Turnover %	-1074.768	154.993	-.261	-6.934	.000
		CMS 5 Star	2.738	12.088	.008	.227	.821

		CMS 5 Star Quality	-26.918	9.813	-.080	-2.743	.006
		Failed Revisit	-.878	43.695	-.001	-.020	.984
		Complaint Tags %	-1.202	.476	-.067	-2.524	.012
		Facility Defficiency Index	-9.785	12.701	-.023	-.770	.441
		Return to Hospital %	3.868	2.486	.040	1.556	.120
		Over Time %	-2.567	4.130	-.016	-.621	.534
		Bad Debt %	2.916	2.671	.027	1.092	.275
		Revenue % of Budget	1.593E-5	.000	.001	.042	.966
1	1	(Constant)	2776.746	134.352		20.668	.000
		Emplyee Engagement Score	-.014	.675	-.001	-.021	.983
		Staff Retention Rate	-626.520	140.479	-.242	-4.460	.000
		Total Staff Turnover %	-898.598	144.478	-.341	-6.220	.000
		CMS 5 Star	6.368	9.007	.027	.707	.480
		CMS 5 Star Quality	7.223	7.788	.032	.927	.354
		Failed Revisit	49.511	44.692	.037	1.108	.268
		Complaint Tags %	-1.228	.399	-.104	-3.078	.002
		Facility Defficiency Index	21.040	9.076	.086	2.318	.021
		Return to Hospital %	-4.515	2.223	-.069	-2.031	.043
		Over Time %	8.851	3.637	.085	2.434	.015
		Bad Debt %	-.685	1.006	-.021	-.680	.496
		Revenue % of Budget	-.009	.042	-.007	-.220	.826
2	1	(Constant)	3319.287	54.480		60.927	.000
		Emplyee Engagement Score	.548	.464	.048	1.182	.238
		Staff Retention Rate	-460.367	48.210	-.416	-9.549	.000
		Total Staff Turnover %	-779.479	54.443	-.597	-14.317	.000
		CMS 5 Star	-2.037	6.890	-.014	-.296	.768
		CMS 5 Star Quality	-6.074	5.999	-.049	-1.013	.312
		Failed Revisit	15.288	23.252	.029	.657	.511
		Complaint Tags %	.359	.244	.068	1.470	.142
		Facility Defficiency Index	-27.959	6.903	-.190	-4.050	.000
		Return to Hospital %	4.080	1.492	.122	2.735	.006
		Over Time %	1.913	2.079	.042	.920	.358
		Bad Debt %	1.862	10.362	.007	.180	.857
		Revenue % of Budget	.006	.012	.020	.531	.596

a. Dependent Variable: Record ID

Residuals Statistics[a]

EHR Level		Minimum	Maximum	Mean	Std. Deviation	N
0	Predicted Value	484.1126	1200.7450	780.5000	96.51521	1560
	Std. Predicted Value	-3.071	4.354	.000	1.000	1560
	Standard Error of Predicted Value	16.652	427.557	37.067	15.879	1560
	Adjusted Predicted Value	465.1049	1380.6226	780.7837	97.74405	1560
	Residual	-872.78192	1024.22070	.00000	440.01683	1560
	Std. Residual	-1.976	2.319	.000	.996	1560
	Stud. Residual	-1.986	2.338	.000	1.000	1560
	Deleted Residual	-882.73193	1040.93591	-.28367	443.82543	1560
	Stud. Deleted Residual	-1.988	2.341	.000	1.000	1560
	Mahal. Distance	1.216	1459.631	11.992	39.297	1560
	Cook's Distance	.000	.200	.001	.005	1560
	Centered Leverage Value	.001	.936	.008	.025	1560
1	Predicted Value	1794.5094	2262.1704	2056.5000	70.00160	992
	Std. Predicted Value	-3.743	2.938	.000	1.000	992
	Standard Error of Predicted Value	14.824	227.249	29.359	12.733	992
	Adjusted Predicted Value	1772.1101	2676.1545	2056.9661	72.72796	992
	Residual	-588.46222	563.66736	.00000	277.82688	992
	Std. Residual	-2.105	2.017	.000	.994	992
	Stud. Residual	-2.117	2.025	-.001	1.001	992
	Deleted Residual	-877.15448	568.42908	-.46609	282.09992	992
	Stud. Deleted Residual	-2.120	2.028	-.001	1.001	992
	Mahal. Distance	1.788	653.996	11.988	30.221	992
	Cook's Distance	.000	.456	.001	.015	992
	Centered Leverage Value	.002	.660	.012	.030	992
2	Predicted Value	2583.0674	3056.1211	2788.5000	82.99959	472
	Std. Predicted Value	-2.475	3.224	.000	1.000	472
	Standard Error of Predicted Value	8.294	108.228	16.991	6.519	472
	Adjusted Predicted Value	2459.1199	3061.0708	2787.3402	84.79421	472
	Residual	-218.27455	321.25150	.00000	108.23925	472
	Std. Residual	-1.991	2.930	.000	.987	472

	Stud. Residual	-2.007	2.975	.003	1.003	472
	Deleted Residual	-221.80371	363.88010	1.15979	113.09480	472
	Stud. Deleted Residual	-2.013	3.001	.003	1.004	472
	Mahal. Distance	1.697	457.903	11.975	23.723	472
	Cook's Distance	.000	.825	.004	.041	472
	Centered Leverage Value	.004	.972	.025	.050	472

a. Dependent Variable: Record ID

```
EXAMINE VARIABLES=RES_1 RES_2 RES_3 RES_4 RES_5 RES_6 RES_7 RES_8 RES_9
RES_10 RES_11 RES_12 BY EHR
  /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT
  /COMPARE GROUPS
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

Explore

Notes

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	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	EHR Level
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User-defined missing values for dependent variables are treated as missing.

	Cases Used	Statistics are based on cases with no missing values for any dependent variable or factor used.
Syntax		EXAMINE VARIABLES=RES_1 RES_2 RES_3 RES_4 RES_5 RES_6 RES_7 RES_8 RES_9 RES_10 RES_11 RES_12 BY EHR /PLOT BOXPLOT STEMLEAF HISTOGRAM NPPLOT /COMPARE GROUPS /STATISTICS DESCRIPTIVES /CINTERVAL 95 /MISSING LISTWISE /NOTOTAL.
Resources	Processor Time	00:00:48.92
	Elapsed Time	00:00:30.36

EHR Level

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	EHR Level	N	Percent	N	Percent	N	Percent
Residual for Engaged	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for StaffRetRate	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for TotTurnoverPct	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for FiveStarAll	0	1560	100.0%	0	0.0%	1560	100.0%

	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for FiveStarQuality	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for FailedRevtIndicator	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for ComplaintTagPCT	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for FacilityDefIndex	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for RTHPCT	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for PctOT	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for BDebtPct	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%
Residual for PctBudget	0	1560	100.0%	0	0.0%	1560	100.0%
	1	992	100.0%	0	0.0%	992	100.0%
	2	472	100.0%	0	0.0%	472	100.0%

Descriptives

	EHR Level			Statistic	Std. Error
Residual for Engaged	0	Mean		.0000	.28965
		95% Confidence Interval for Mean	Lower Bound	-.5682	
			Upper Bound	.5682	
		5% Trimmed Mean		-.5917	
		Median		-1.4919	
		Variance		130.882	
		Std. Deviation		11.44038	
		Minimum		-25.68	

		Maximum		44.34	
		Range		70.02	
		Interquartile Range		14.28	
		Skewness		.755	.062
		Kurtosis		1.027	.124
	1	Mean		.0000	.43319
		95% Confidence Interval for Mean	Lower Bound	-.8501	
			Upper Bound	.8501	
		5% Trimmed Mean		-.4049	
		Median		.6013	
		Variance		186.155	
		Std. Deviation		13.64387	
		Minimum		-28.38	
		Maximum		41.94	
		Range		70.32	
		Interquartile Range		14.85	
		Skewness		.422	.078
		Kurtosis		.636	.155
	2	Mean		.0000	.54555
		95% Confidence Interval for Mean	Lower Bound	-1.0720	
			Upper Bound	1.0720	
		5% Trimmed Mean		-.2935	
		Median		.8323	
		Variance		140.479	
		Std. Deviation		11.85239	
		Minimum		-22.41	
		Maximum		33.94	
		Range		56.35	
		Interquartile Range		15.32	
		Skewness		.272	.112
		Kurtosis		.364	.224
Residual for StaffRetRate	0	Mean		.0000	.00302
		95% Confidence Interval for Mean	Lower Bound	-.0059	
			Upper Bound	.0059	
		5% Trimmed Mean		-.0001	
		Median		.0057	
		Variance		.014	

			Std. Deviation	.11927	
			Minimum	-.37	
			Maximum	.30	
			Range	.67	
			Interquartile Range	.16	
			Skewness	-.043	.062
			Kurtosis	-.148	.124
		1	Mean	.0000	.00352
			95% Confidence Interval for Mean	Lower Bound	-.0069
				Upper Bound	.0069
			5% Trimmed Mean	-.0008	
			Median	-.0034	
			Variance	.012	
			Std. Deviation	.11085	
			Minimum	-.29	
			Maximum	.28	
			Range	.57	
			Interquartile Range	.15	
			Skewness	.103	.078
			Kurtosis	-.421	.155
		2	Mean	.0000	.00566
			95% Confidence Interval for Mean	Lower Bound	-.0111
				Upper Bound	.0111
			5% Trimmed Mean	.0023	
			Median	.0171	
			Variance	.015	
			Std. Deviation	.12298	
			Minimum	-.32	
			Maximum	.32	
			Range	.64	
			Interquartile Range	.19	
			Skewness	-.289	.112
			Kurtosis	-.474	.224
Residual for TotTurnoverPct		0	Mean	.0000	.00277
			95% Confidence Interval for Mean	Lower Bound	-.0054
				Upper Bound	.0054
			5% Trimmed Mean	.0042	

		Median		.0088	
		Variance		.012	
		Std. Deviation		.10927	
		Minimum		-.34	
		Maximum		.26	
		Range		.60	
		Interquartile Range		.14	
		Skewness		-.507	.062
		Kurtosis		.187	.124
	1	Mean		.0000	.00345
		95% Confidence Interval for Mean	Lower Bound	-.0068	
			Upper Bound	.0068	
		5% Trimmed Mean		.0012	
		Median		.0074	
		Variance		.012	
		Std. Deviation		.10881	
		Minimum		-.25	
		Maximum		.31	
		Range		.56	
		Interquartile Range		.15	
		Skewness		-.170	.078
		Kurtosis		-.477	.155
	2	Mean		.0000	.00479
		95% Confidence Interval for Mean	Lower Bound	-.0094	
			Upper Bound	.0094	
		5% Trimmed Mean		.0001	
		Median		-.0012	
		Variance		.011	
		Std. Deviation		.10398	
		Minimum		-.27	
		Maximum		.24	
		Range		.51	
		Interquartile Range		.14	
		Skewness		.029	.112
		Kurtosis		-.613	.224
Residual for FiveStarAll	0	Mean		.0000	.03341
		95% Confidence Interval for	Lower Bound	-.0655	

		Mean	Upper Bound	.0655	
		5% Trimmed Mean		-.0639	
		Median		-.2941	
		Variance		1.741	
		Std. Deviation		1.31946	
		Minimum		-2.08	
		Maximum		2.94	
		Range		5.03	
		Interquartile Range		1.99	
		Skewness		.766	.062
		Kurtosis		-.544	.124
	1	Mean		.0000	.03602
		95% Confidence Interval for Mean	Lower Bound	-.0707	
			Upper Bound	.0707	
		5% Trimmed Mean		-.0954	
		Median		-.1492	
		Variance		1.287	
		Std. Deviation		1.13436	
		Minimum		-1.65	
		Maximum		3.19	
		Range		4.84	
		Interquartile Range		1.56	
		Skewness		1.157	.078
		Kurtosis		.633	.155
	2	Mean		.0000	.04141
		95% Confidence Interval for Mean	Lower Bound	-.0814	
			Upper Bound	.0814	
		5% Trimmed Mean		-.0272	
		Median		-.1512	
		Variance		.809	
		Std. Deviation		.89969	
		Minimum		-1.91	
		Maximum		2.18	
		Range		4.08	
		Interquartile Range		1.59	
		Skewness		.316	.112
		Kurtosis		-.834	.224

Residual for FiveStarQuality	0	Mean		.0000	.03324
		95% Confidence Interval for Mean	Lower Bound	-.0652	
			Upper Bound	.0652	
		5% Trimmed Mean		.0538	
		Median		.2035	
		Variance		1.724	
		Std. Deviation		1.31300	
		Minimum		-3.01	
		Maximum		1.81	
		Range		4.82	
		Interquartile Range		2.03	
		Skewness		-.480	.062
		Kurtosis		-.843	.124
	1	Mean		.0000	.04065
		95% Confidence Interval for Mean	Lower Bound	-.0798	
			Upper Bound	.0798	
		5% Trimmed Mean		-.0009	
		Median		.0700	
		Variance		1.640	
		Std. Deviation		1.28044	
		Minimum		-3.13	
		Maximum		2.32	
		Range		5.45	
		Interquartile Range		2.00	
		Skewness		.038	.078
		Kurtosis		-1.022	.155
	2	Mean		.0000	.04582
		95% Confidence Interval for Mean	Lower Bound	-.0900	
			Upper Bound	.0900	
		5% Trimmed Mean		.0599	
		Median		.2474	
		Variance		.991	
		Std. Deviation		.99552	
		Minimum		-2.93	
		Maximum		1.50	
		Range		4.43	
		Interquartile Range		1.51	

		Skewness		-.774	.112
		Kurtosis		-.188	.224
Residual for FailedRevtIndicator	0	Mean		.0000	.00676
		95% Confidence Interval for Mean	Lower Bound	-.0133	
			Upper Bound	.0133	
		5% Trimmed Mean		-.0444	
		Median		-.0718	
		Variance		.071	
		Std. Deviation		.26700	
		Minimum		-.16	
		Maximum		.95	
		Range		1.11	
		Interquartile Range		.03	
		Skewness		3.120	.062
		Kurtosis		7.819	.124
	1	Mean		.0000	.00669
		95% Confidence Interval for Mean	Lower Bound	-.0131	
			Upper Bound	.0131	
		5% Trimmed Mean		-.0430	
		Median		-.0420	
		Variance		.044	
		Std. Deviation		.21080	
		Minimum		-.18	
		Maximum		.97	
		Range		1.15	
		Interquartile Range		.02	
		Skewness		4.198	.078
		Kurtosis		15.911	.155
	2	Mean		.0000	.01201
		95% Confidence Interval for Mean	Lower Bound	-.0236	
			Upper Bound	.0236	
		5% Trimmed Mean		-.0448	
		Median		-.0646	
		Variance		.068	
		Std. Deviation		.26101	
		Minimum		-.14	
		Maximum		.98	

		Range		1.12	
		Interquartile Range		.05	
		Skewness		3.247	.112
		Kurtosis		8.788	.224
Residual for ComplaintTagPCT	0	Mean		.0000	.63480
		95% Confidence Interval for Mean	Lower Bound	-1.2452	
			Upper Bound	1.2452	
		5% Trimmed Mean		-2.3224	
		Median		-5.0450	
		Variance		628.641	
		Std. Deviation		25.07272	
		Minimum		-26.33	
		Maximum		75.41	
		Range		101.74	
		Interquartile Range		39.97	
		Skewness		1.014	.062
		Kurtosis		.666	.124
	1	Mean		.0000	.76897
		95% Confidence Interval for Mean	Lower Bound	-1.5090	
			Upper Bound	1.5090	
		5% Trimmed Mean		-3.1650	
		Median		-14.4879	
		Variance		586.581	
		Std. Deviation		24.21943	
		Minimum		-17.04	
		Maximum		85.37	
		Range		102.41	
		Interquartile Range		22.37	
		Skewness		1.841	.078
		Kurtosis		2.798	.155
	2	Mean		.0000	1.19276
		95% Confidence Interval for Mean	Lower Bound	-2.3438	
			Upper Bound	2.3438	
		5% Trimmed Mean		-1.8335	
		Median		-7.8494	
		Variance		671.499	
		Std. Deviation		25.91330	

		Minimum		-25.31	
		Maximum		70.89	
		Range		96.20	
		Interquartile Range		39.44	
		Skewness		.900	.112
		Kurtosis		-.381	.224
Residual for FacilityDefIndex	0	Mean		.0000	.02686
		95% Confidence Interval for Mean	Lower Bound	-.0527	
			Upper Bound	.0527	
		5% Trimmed Mean		-.0637	
		Median		-.1392	
		Variance		1.126	
		Std. Deviation		1.06106	
		Minimum		-1.79	
		Maximum		4.62	
		Range		6.41	
		Interquartile Range		1.37	
		Skewness		.910	.062
		Kurtosis		1.221	.124
	1	Mean		.0000	.03673
		95% Confidence Interval for Mean	Lower Bound	-.0721	
			Upper Bound	.0721	
		5% Trimmed Mean		-.0920	
		Median		-.1781	
		Variance		1.338	
		Std. Deviation		1.15690	
		Minimum		-1.75	
		Maximum		6.51	
		Range		8.26	
		Interquartile Range		1.35	
		Skewness		1.727	.078
		Kurtosis		5.664	.155
	2	Mean		.0000	.04340
		95% Confidence Interval for Mean	Lower Bound	-.0853	
			Upper Bound	.0853	
		5% Trimmed Mean		-.0412	
		Median		-.1235	

		Variance		.889	
		Std. Deviation		.94295	
		Minimum		-1.72	
		Maximum		3.02	
		Range		4.73	
		Interquartile Range		1.29	
		Skewness		.633	.112
		Kurtosis		.105	.224
Residual for RTHPCT	0	Mean		.0000	.11856
		95% Confidence Interval for Mean	Lower Bound	-.2326	
			Upper Bound	.2326	
		5% Trimmed Mean		-.0249	
		Median		-.2727	
		Variance		21.929	
		Std. Deviation		4.68282	
		Minimum		-14.88	
		Maximum		13.74	
		Range		28.62	
		Interquartile Range		6.27	
		Skewness		.063	.062
		Kurtosis		-.112	.124
	1	Mean		.0000	.13950
		95% Confidence Interval for Mean	Lower Bound	-.2737	
			Upper Bound	.2737	
		5% Trimmed Mean		-.1026	
		Median		-.2682	
		Variance		19.303	
		Std. Deviation		4.39354	
		Minimum		-10.83	
		Maximum		14.83	
		Range		25.66	
		Interquartile Range		6.64	
		Skewness		.288	.078
		Kurtosis		-.375	.155
	2	Mean		.0000	.18750
		95% Confidence Interval for Mean	Lower Bound	-.3684	
			Upper Bound	.3684	

		5% Trimmed Mean		.0879	
		Median		.5058	
		Variance		16.594	
		Std. Deviation		4.07362	
		Minimum		-10.76	
		Maximum		8.58	
		Range		19.33	
		Interquartile Range		5.04	
		Skewness		-.377	.112
		Kurtosis		-.144	.224
Residual for PctOT	0	Mean		.0000	.07127
		95% Confidence Interval for Mean	Lower Bound	-.1398	
			Upper Bound	.1398	
		5% Trimmed Mean		-.0921	
		Median		-.1512	
		Variance		7.924	
		Std. Deviation		2.81498	
		Minimum		-6.57	
		Maximum		11.95	
		Range		18.52	
		Interquartile Range		3.61	
		Skewness		.531	.062
		Kurtosis		.476	.124
	1	Mean		.0000	.08688
		95% Confidence Interval for Mean	Lower Bound	-.1705	
			Upper Bound	.1705	
		5% Trimmed Mean		-.1361	
		Median		-.2927	
		Variance		7.488	
		Std. Deviation		2.73634	
		Minimum		-5.04	
		Maximum		10.49	
		Range		15.53	
		Interquartile Range		3.85	
		Skewness		.687	.078
		Kurtosis		.345	.155
	2	Mean		.0000	.13299

		95% Confidence Interval for Mean	Lower Bound	-.2613	
			Upper Bound	.2613	
		5% Trimmed Mean		-.0997	
		Median		-.0829	
		Variance		8.348	
		Std. Deviation		2.88933	
		Minimum		-6.31	
		Maximum		9.53	
		Range		15.84	
		Interquartile Range		3.74	
		Skewness		.457	.112
		Kurtosis		.101	.224
Residual for BDebtPct	0	Mean		.0000	.10635
		95% Confidence Interval for Mean	Lower Bound	-.2086	
			Upper Bound	.2086	
		5% Trimmed Mean		-.1148	
		Median		-.0897	
		Variance		17.643	
		Std. Deviation		4.20033	
		Minimum		-38.73	
		Maximum		75.41	
		Range		114.15	
		Interquartile Range		.27	
		Skewness		8.793	.062
		Kurtosis		158.966	.124
	1	Mean		.0000	.28300
		95% Confidence Interval for Mean	Lower Bound	-.5554	
			Upper Bound	.5554	
		5% Trimmed Mean		-.4195	
		Median		-.4628	
		Variance		79.450	
		Std. Deviation		8.91349	
		Minimum		-18.73	
		Maximum		227.78	
		Range		246.51	
		Interquartile Range		.25	
		Skewness		22.421	.078

		Kurtosis		528.252	.155
	2	Mean		.0000	.02365
		95% Confidence Interval for Mean	Lower Bound	-.0465	
			Upper Bound	.0465	
		5% Trimmed Mean		-.0207	
		Median		-.0335	
		Variance		.264	
		Std. Deviation		.51378	
		Minimum		-7.03	
		Maximum		5.16	
		Range		12.18	
		Interquartile Range		.16	
		Skewness		-2.250	.112
		Kurtosis		100.536	.224
Residual for PctBudget	0	Mean		.0000	755.09267
		95% Confidence Interval for Mean	Lower Bound	-1481.1043	
			Upper Bound	1481.1043	
		5% Trimmed Mean		-860.8072	
		Median		-910.4648	
		Variance		889457303.100	
		Std. Deviation		29823.77077	
		Minimum		-102568.92	
		Maximum		1.14E+6	
		Range		1241757.13	
		Interquartile Range		680.81	
		Skewness		36.272	.062
		Kurtosis		1372.488	.124
	1	Mean		.0000	18.55279
		95% Confidence Interval for Mean	Lower Bound	-36.4073	
			Upper Bound	36.4073	
		5% Trimmed Mean		-55.2341	
		Median		-99.4788	
		Variance		341452.253	
		Std. Deviation		584.33916	
		Minimum		-5032.46	
		Maximum		3263.73	
		Range		8296.19	

		Interquartile Range		522.93	
		Skewness		1.366	.078
		Kurtosis		11.764	.155
	2	Mean		.0000	42.39827
		95% Confidence Interval for Mean	Lower Bound	-83.3132	
			Upper Bound	83.3132	
		5% Trimmed Mean		-40.3572	
		Median		-108.1173	
		Variance		848473.472	
		Std. Deviation		921.12620	
		Minimum		-1382.04	
		Maximum		10645.50	
		Range		12027.55	
		Interquartile Range		1138.40	
		Skewness		3.473	.112
		Kurtosis		36.574	.224

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	EHR Level	Statistic	df	Sig.	Statistic	df	Sig.
Residual for Engaged	0	.078	1560	.000	.963	1560	.000
	1	.088	992	.000	.972	992	.000
	2	.065	472	.000	.972	472	.000
Residual for StaffRetRate	0	.024	1560	.033	.997	1560	.003
	1	.019	992	.200*	.994	992	.001
	2	.060	472	.000	.985	472	.000
Residual for TotTurnoverPct	0	.041	1560	.000	.981	1560	.000
	1	.039	992	.001	.986	992	.000
	2	.041	472	.053	.987	472	.000
Residual for FiveStarAll	0	.169	1560	.000	.897	1560	.000
	1	.181	992	.000	.858	992	.000
	2	.104	472	.000	.957	472	.000
Residual for FiveStarQuality	0	.115	1560	.000	.927	1560	.000
	1	.106	992	.000	.956	992	.000
	2	.130	472	.000	.928	472	.000
Residual for FailedRevtIndicator	0	.485	1560	.000	.363	1560	.000
	1	.482	992	.000	.296	992	.000

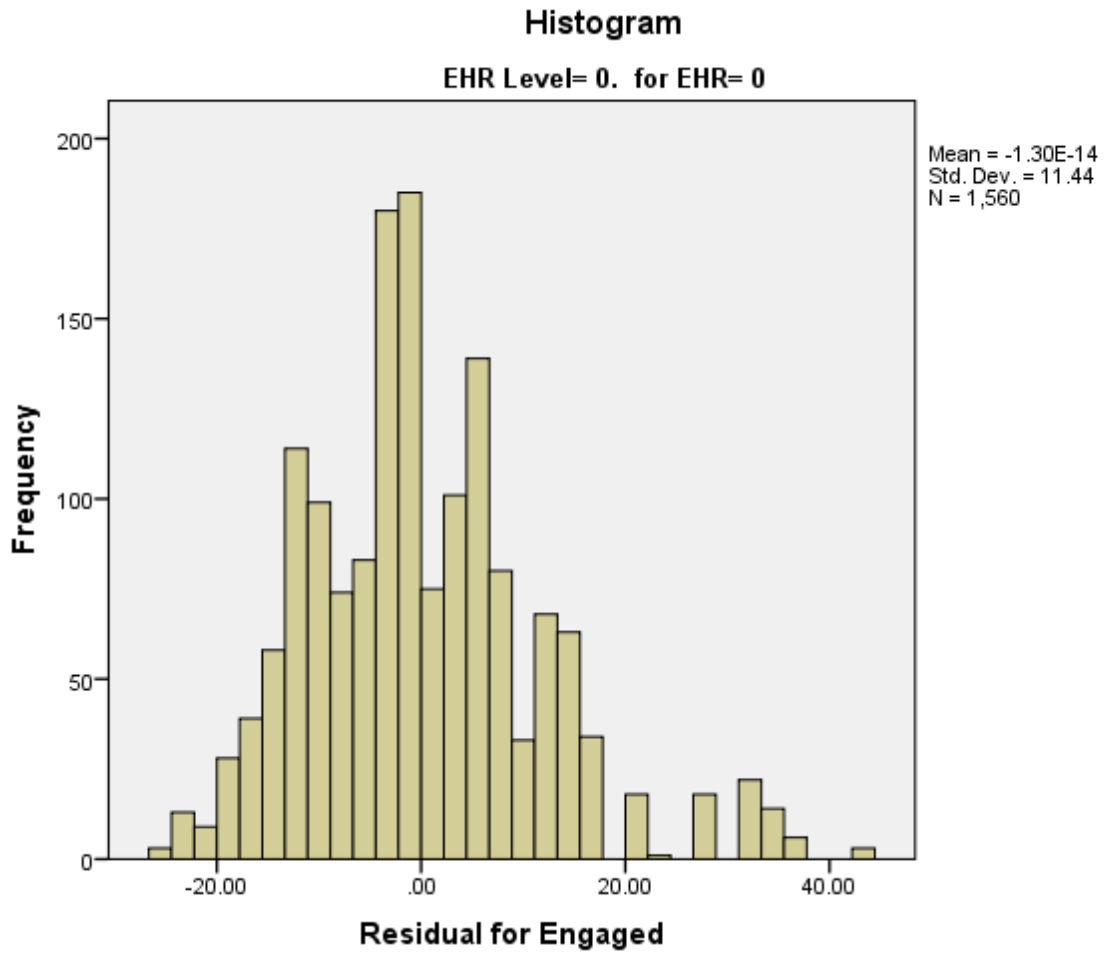
	2	.456	472	.000	.391	472	.000
Residual for ComplaintTagPCT	0	.147	1560	.000	.880	1560	.000
	1	.311	992	.000	.686	992	.000
	2	.164	472	.000	.855	472	.000
Residual for FacilityDefIndex	0	.063	1560	.000	.953	1560	.000
	1	.082	992	.000	.886	992	.000
	2	.066	472	.000	.968	472	.000
Residual for RTHPCT	0	.024	1560	.041	.998	1560	.032
	1	.047	992	.000	.987	992	.000
	2	.061	472	.000	.983	472	.000
Residual for PctOT	0	.042	1560	.000	.984	1560	.000
	1	.052	992	.000	.968	992	.000
	2	.045	472	.024	.983	472	.000
Residual for BDebtPct	0	.377	1560	.000	.196	1560	.000
	1	.440	992	.000	.052	992	.000
	2	.289	472	.000	.372	472	.000
Residual for PctBudget	0	.478	1560	.000	.019	1560	.000
	1	.129	992	.000	.806	992	.000
	2	.070	472	.000	.817	472	.000

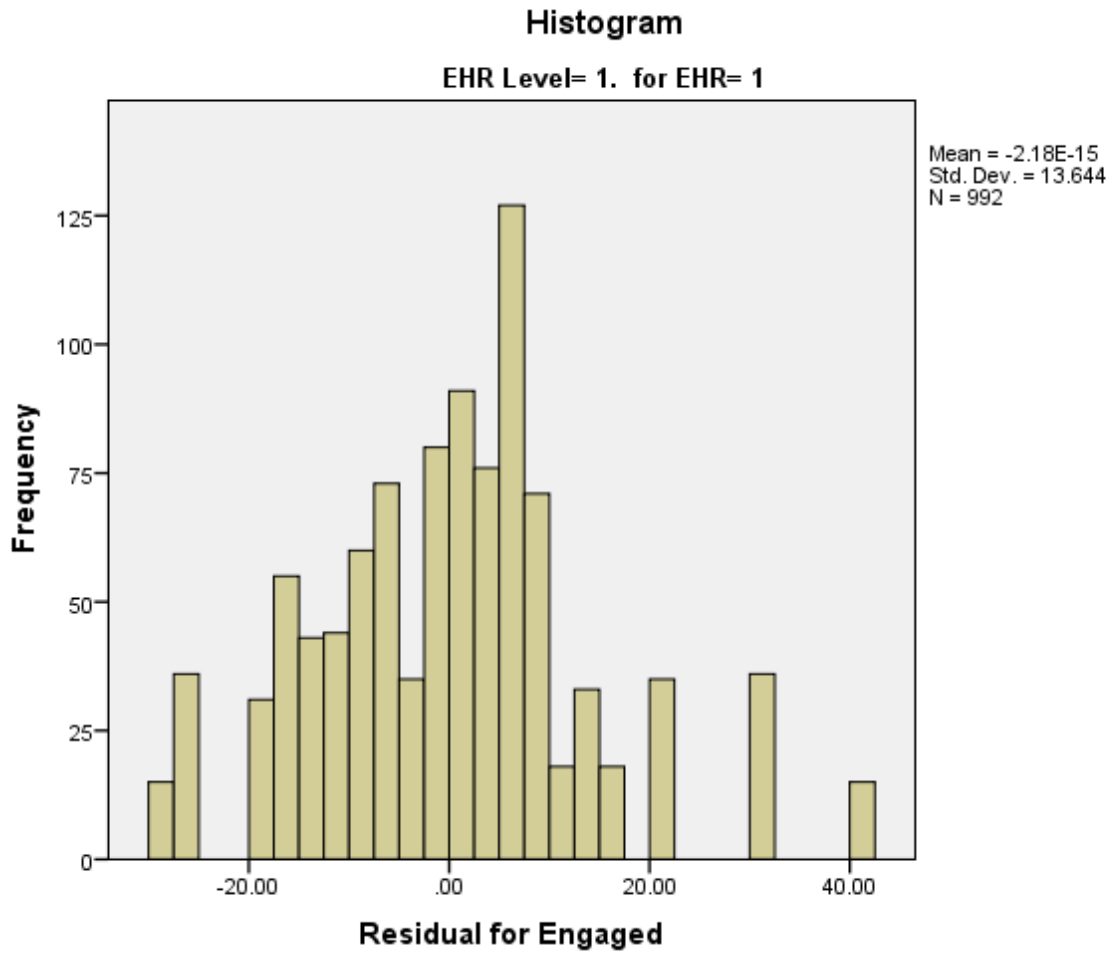
*. This is a lower bound of the true significance.

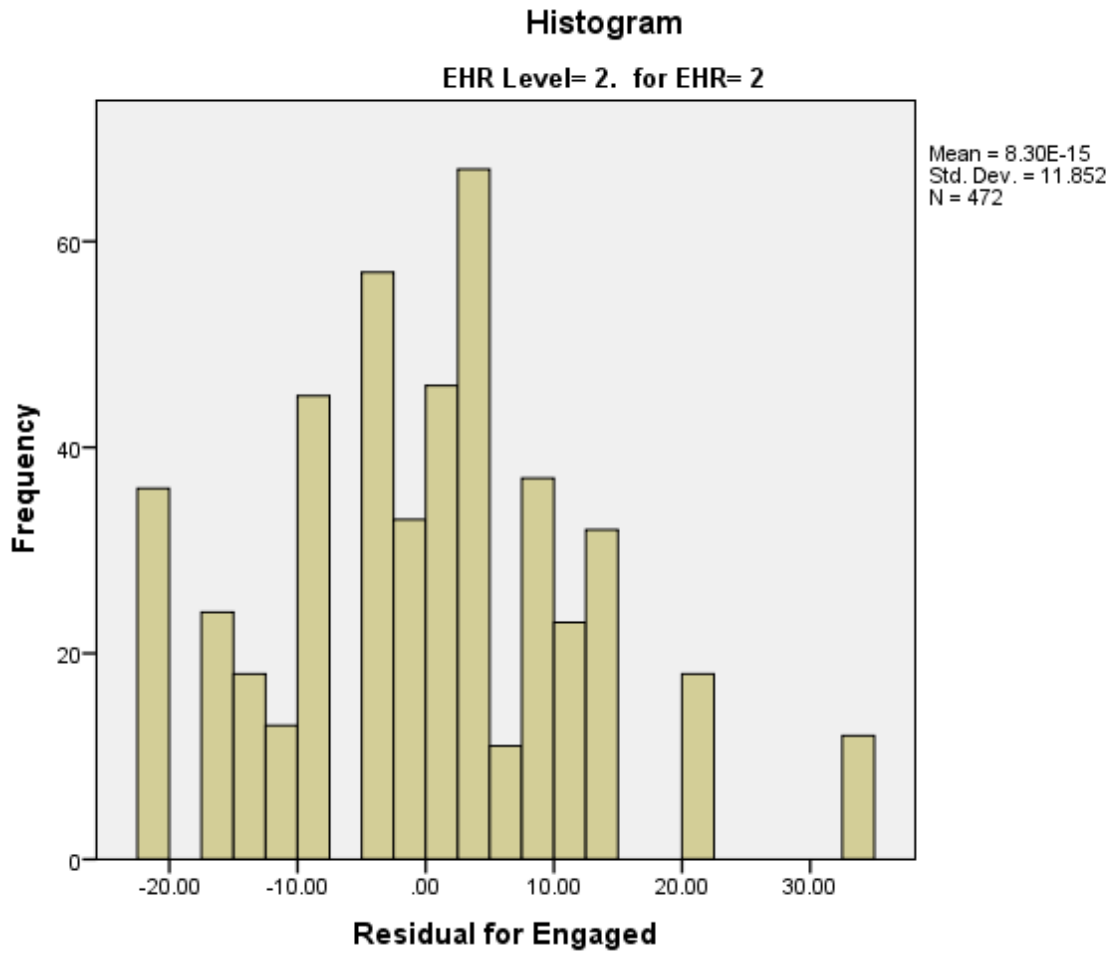
a. Lilliefors Significance Correction

Residual for Engaged

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = -1.30E-14
Std. Dev. = 11.44
N = 1,560
Frequency
200
150
100
50
0
-20.00
.00
20.00
40.00
Residual for Engaged


Histogram
EHR Level= 1. for EHR= 1
Mean = -2.18E-15
Std. Dev. = 13.644
N = 992
Frequency
125
100
75
50
25
0
-20.00
.00
20.00
40.00
Residual for Engaged



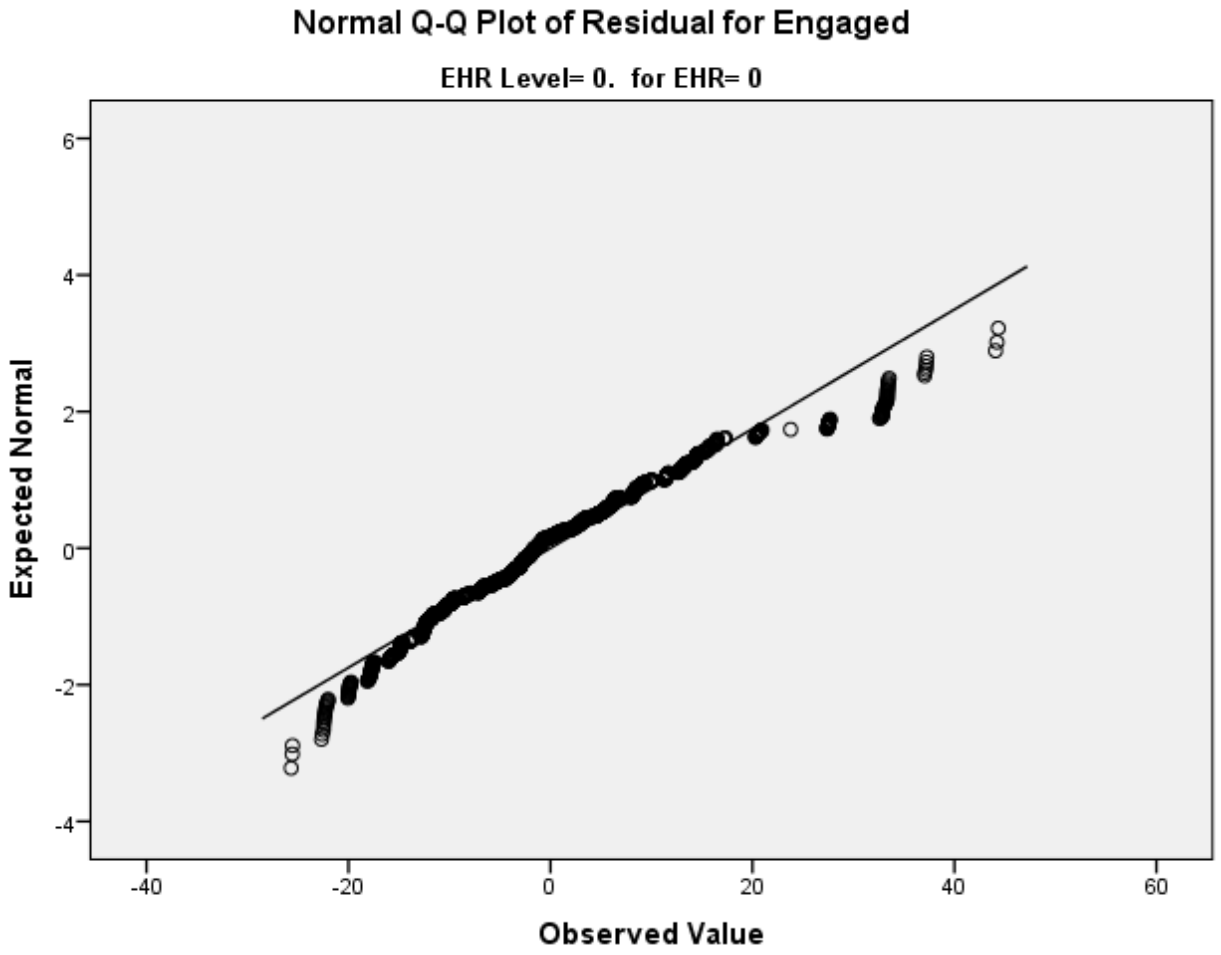
Stem-and-Leaf Plots

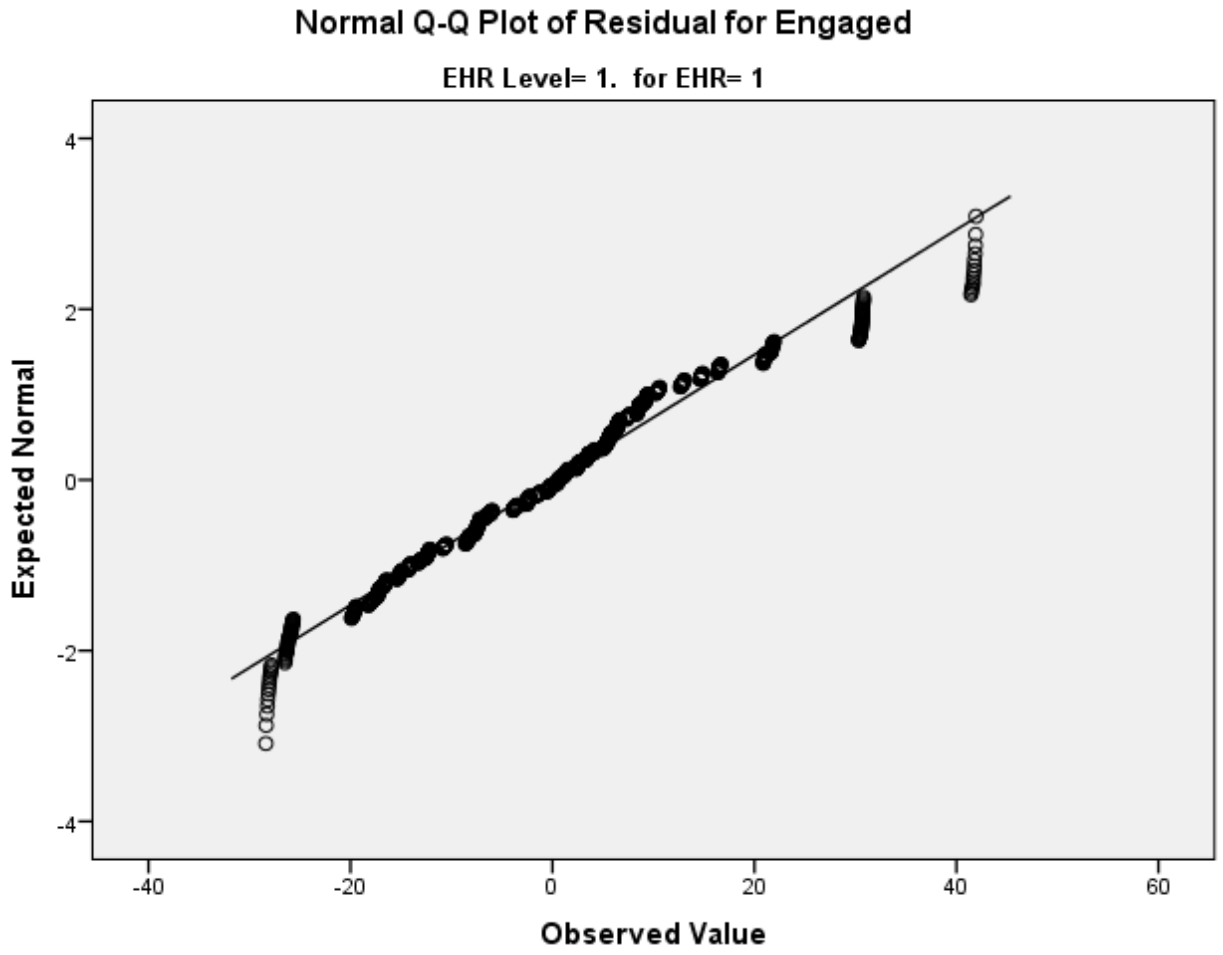
```
Residual for Engaged Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     3.00       -2 .  5
    18.00       -2 .  222222222
     4.00       -2 .  00
    18.00       -1 .  889999999
    35.00       -1 .  67777777777777777
    54.00       -1 .  444444444444444455555555555
    99.00       -1 .  22222222222222222222222222222222222333333333
    92.00       -1 .  00000000000000000000000000011111111111111111
    71.00       -0 .  88888888888888899999999999999999999
    65.00       -0 .  66666666666666666666777777777777
    83.00       -0 .  44444444444444444444555555555555555555555
   179.00       -0 .
22222222222222222222222222222222222222222222222233333333333333333333333333
```

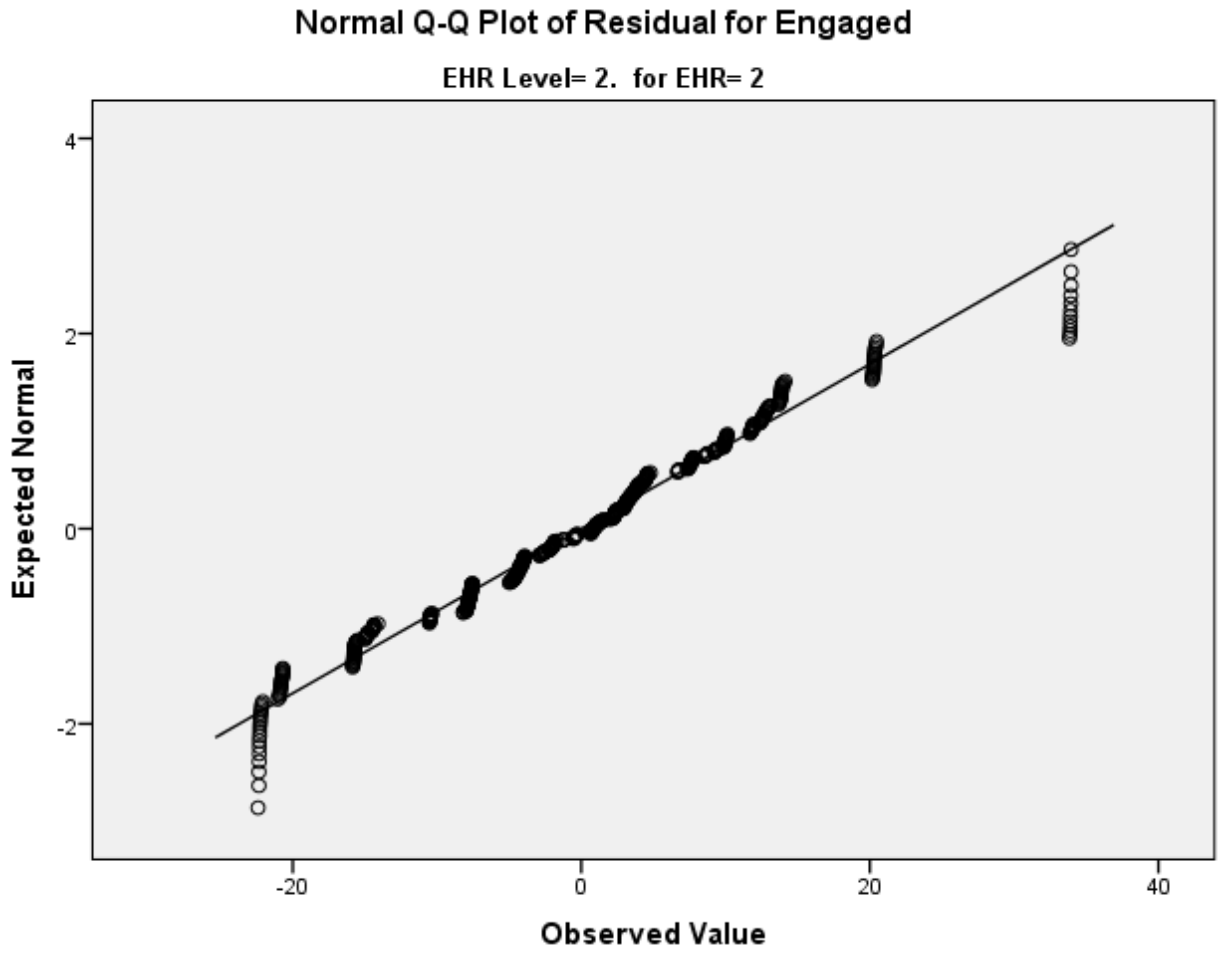
```
333333333333333333
   164.00       -0 .
000000000000000000000000000001111111111111111111111111111111111111111111
11111111111
    64.00        0 .  0000000000000000000000111111111
   106.00        0 .
222222222222222222222222222223333333333333333333333333
    89.00        0 .  444444444444444455555555555555555555555555
    63.00        0 .  666666666666666666666666666667
   104.00        0 .
888888888888888888888888888888888888888999999999999
    39.00        1 .  0111111111111111111
    48.00        1 .  22222222233333333333
    59.00        1 .  44444444444444444555555555555
    21.00        1 .  6666666667
      .00        1 .
    18.00        2 .  000000000
     1.00        2 .  &
      .00        2 .
    17.00        2 .  77777777
    46.00 Extremes    (>=28)

 Stem width:     10.00
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for Engaged Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

    51.00       -2 .  55555666666677888
      .00       -2 .
    86.00       -1 .  55555566666677777777788999999
    87.00       -1 .  000000222222222233334444444
   133.00       -0 .  566666666667777777777777777777788888888888
   115.00       -0 .  000000000001111112222222222222333333333
   167.00        0 .
000000000000011111111111222222222222233333333334444444
   198.00        0 .
555555555555555555555566666666666666667777778888888888889999999999
    51.00        1 .  00000022223344444
    18.00        1 .  666666
    35.00        2 .  000011111111
    51.00 Extremes    (>=30)

 Stem width:     10.00
 Each leaf:        3 case(s)
```

```
Residual for Engaged Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

    36.00       -2 .  00000000222222222&
    24.00       -1 .  555555555555
    31.00       -1 .  000000444444444
    45.00       -0 .  777777777777777777778
    90.00       -0 .  000001111112222222223334444444444444444444444
   113.00        0 .
00000001111112222222222223333333333333333334444444444
    48.00        0 .  6677777777888999999999
    55.00        1 .  000111111222222223333333334
      .00        1 .
    18.00        2 .  000000000
    12.00 Extremes    (>=34)

 Stem width:     10.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

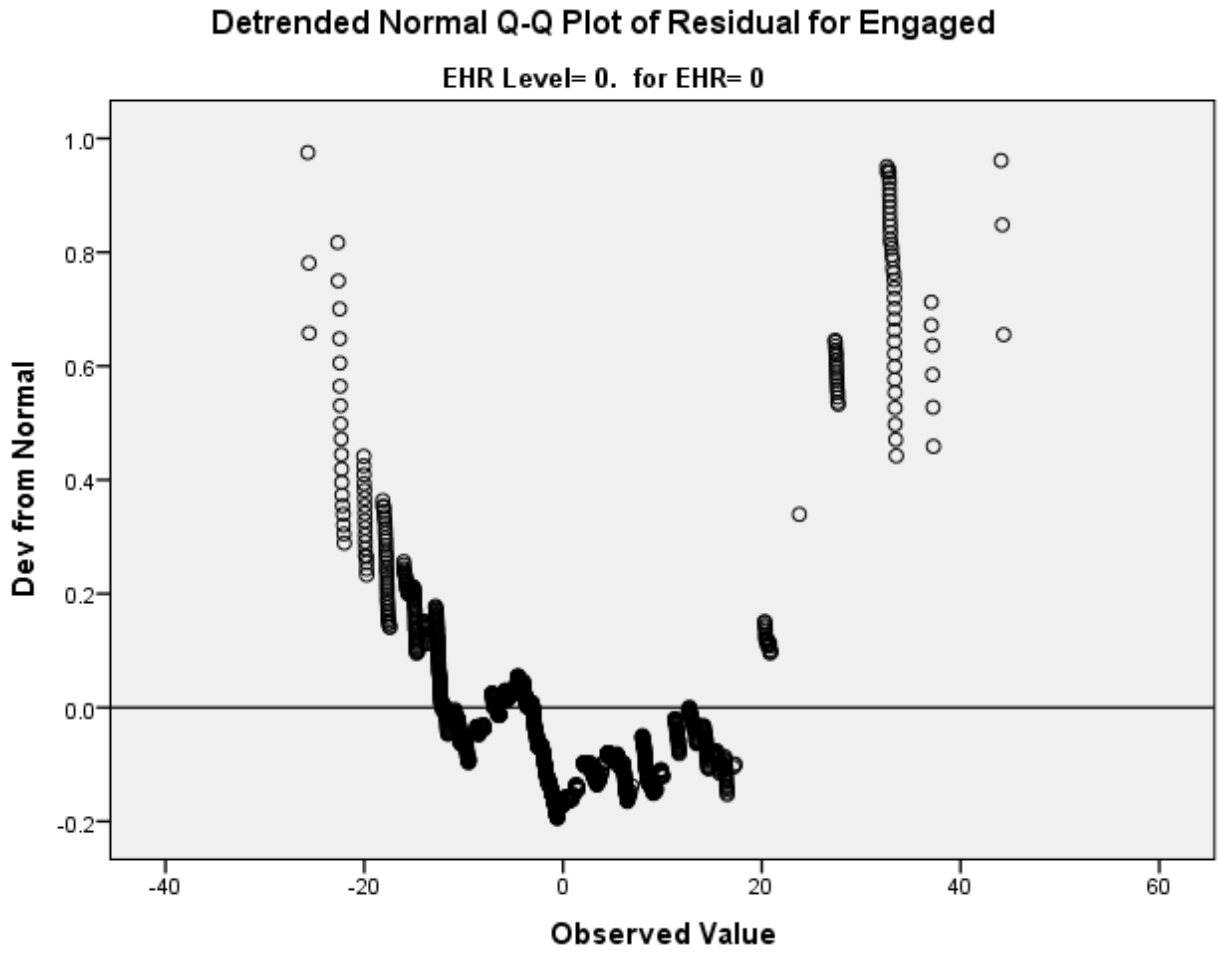
Normal Q-Q Plots

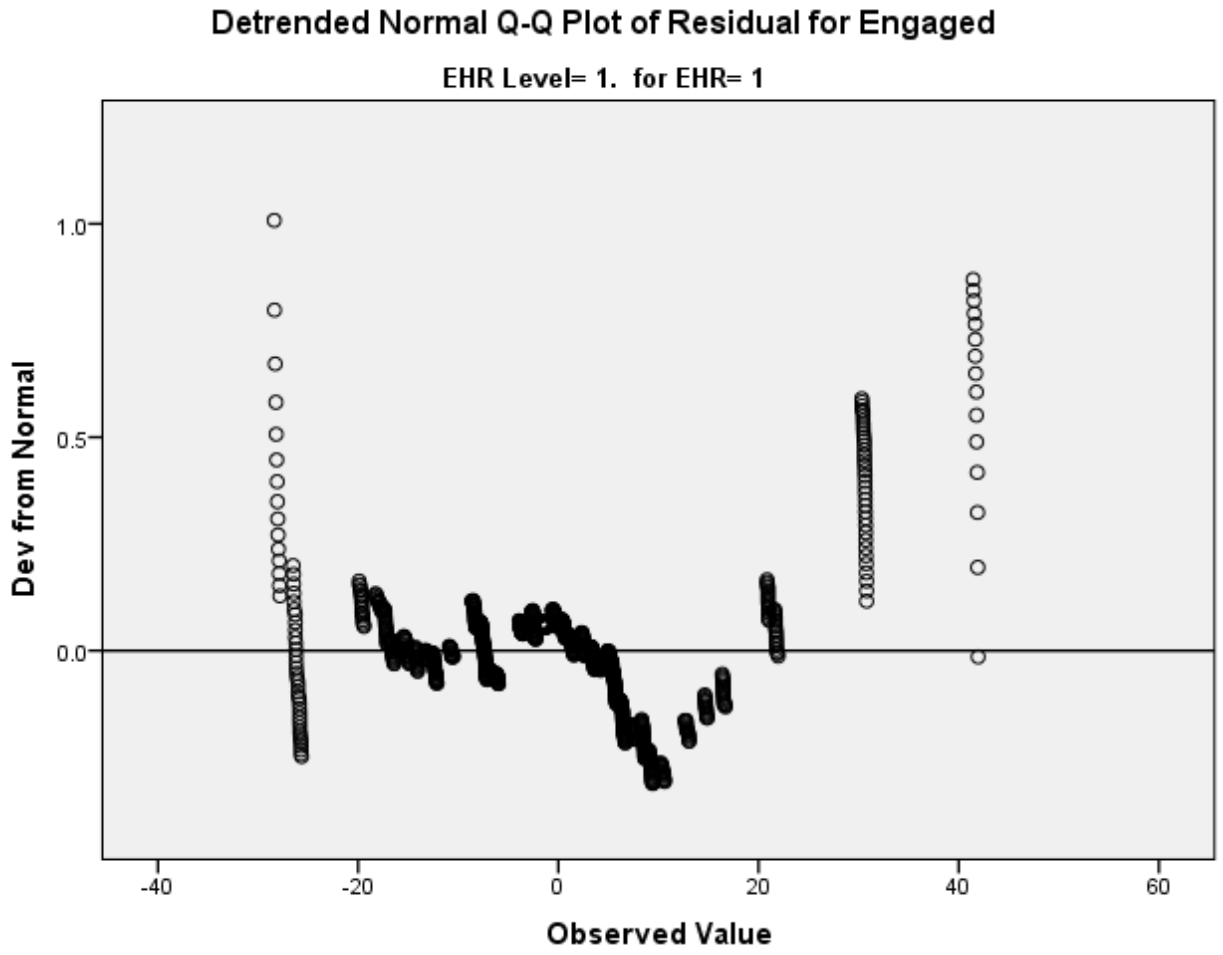

Normal Q-Q Plot of Residual for Engaged
EHR Level= 0. for EHR= 0
Expected Normal
Observed Value
6
4
2
0
-2
-4
-40
-20
0
20
40
60

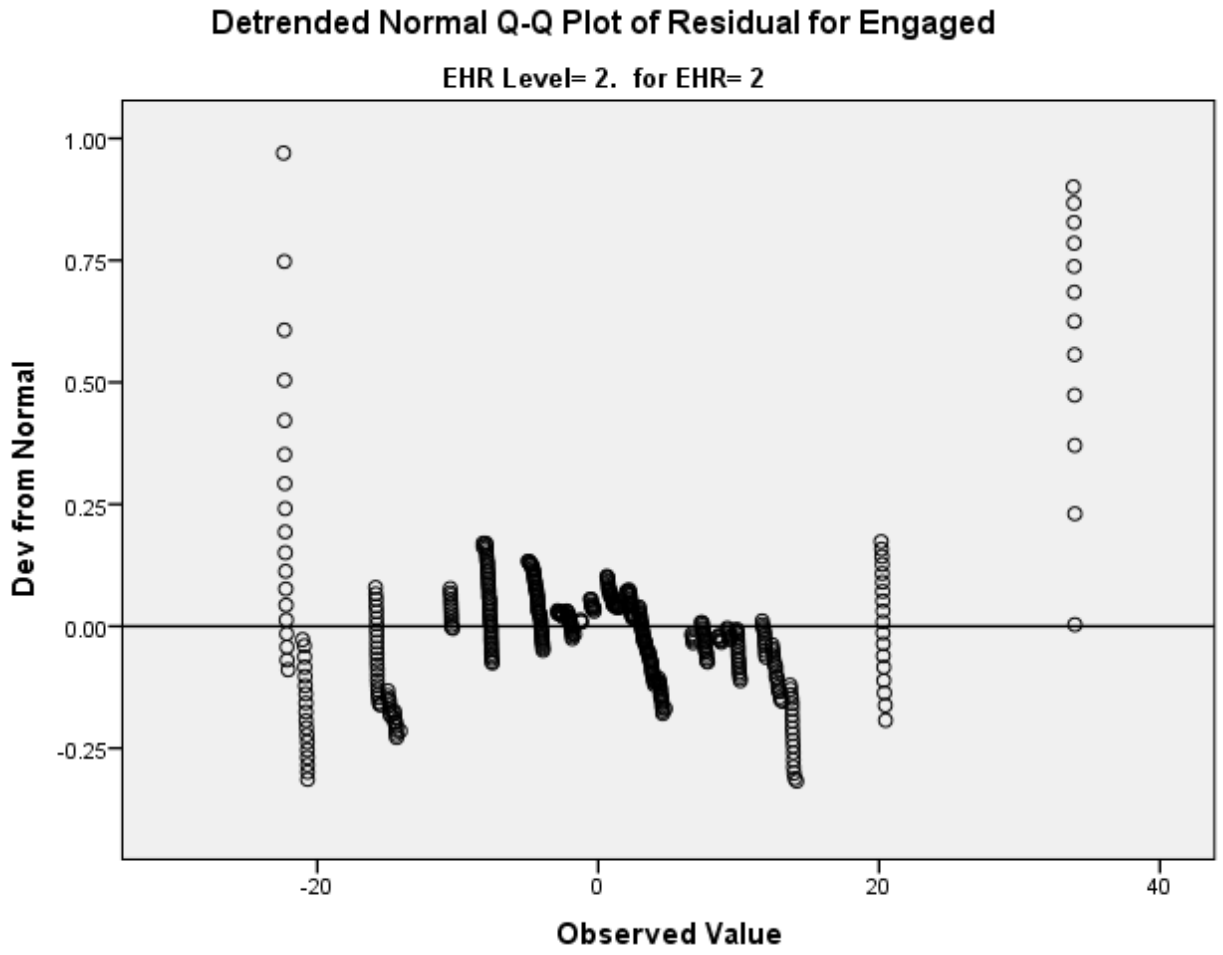

Normal Q-Q Plot of Residual for Engaged
EHR Level= 1. for EHR= 1
Expected Normal
Observed Value
4
2
0
-2
-4
-40
-20
0
20
40
60


Normal Q-Q Plot of Residual for Engaged
EHR Level= 2. for EHR= 2
Expected Normal
4
2
0
-2
-20
0
20
40
Observed Value

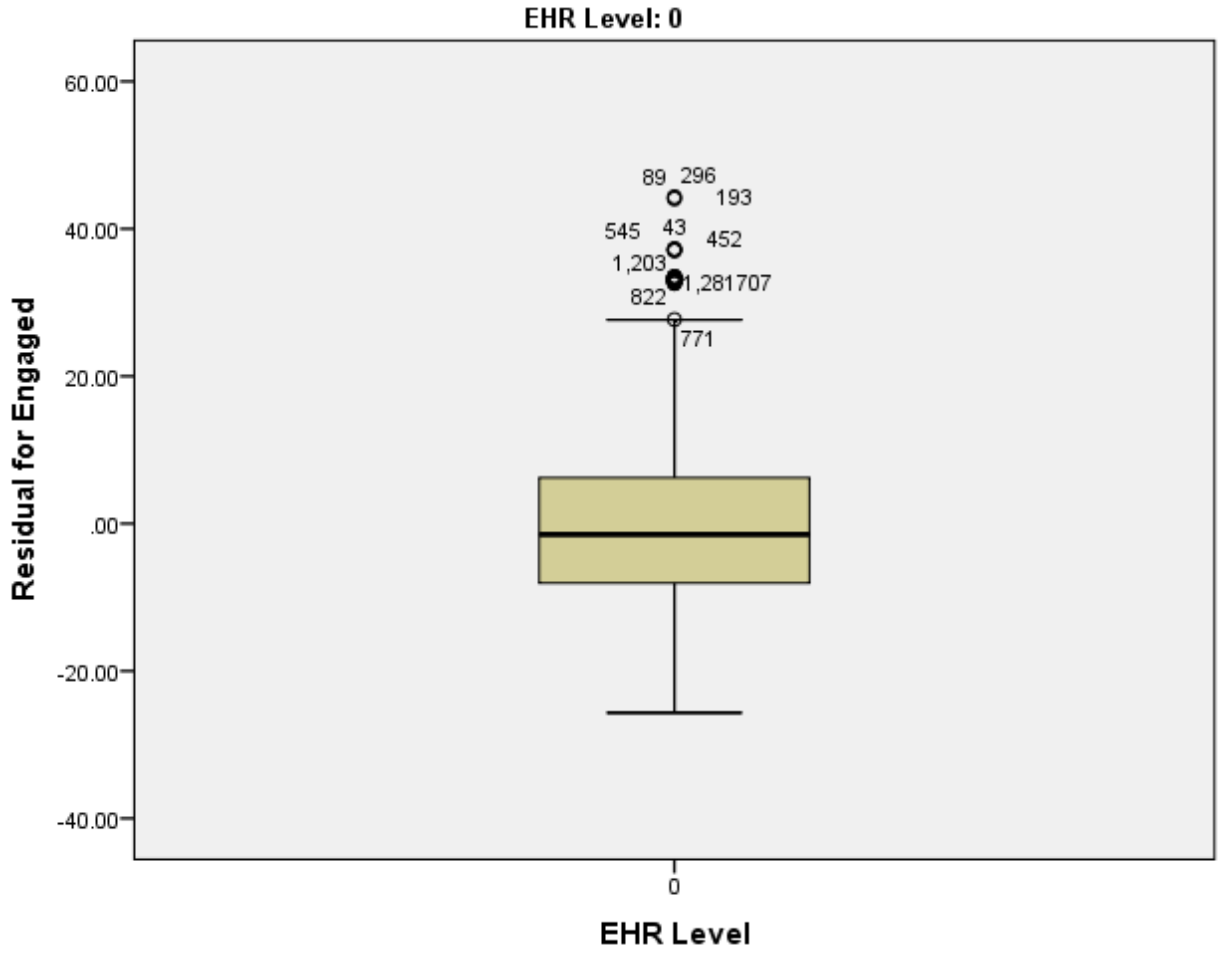
Detrended Normal Q-Q Plots

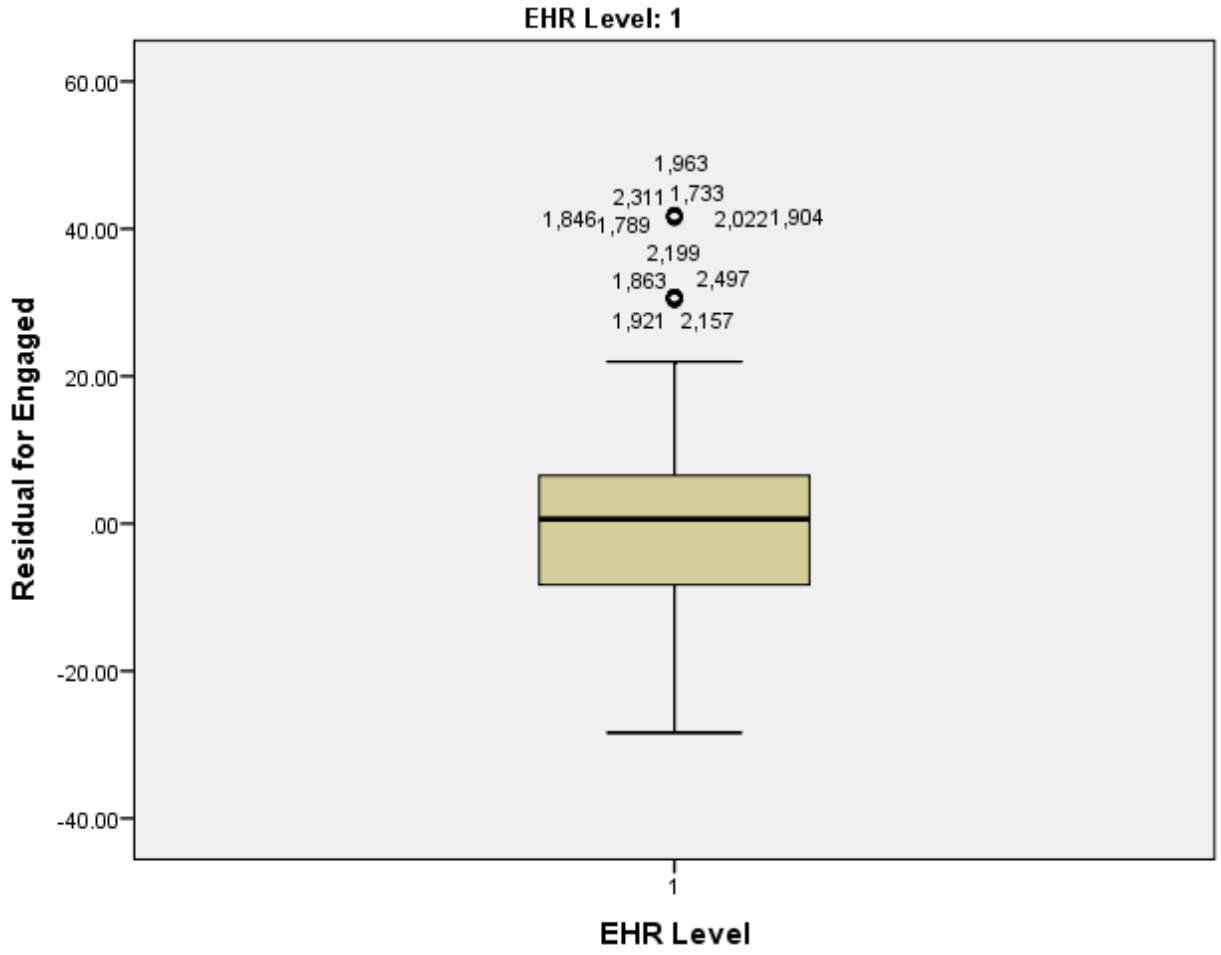


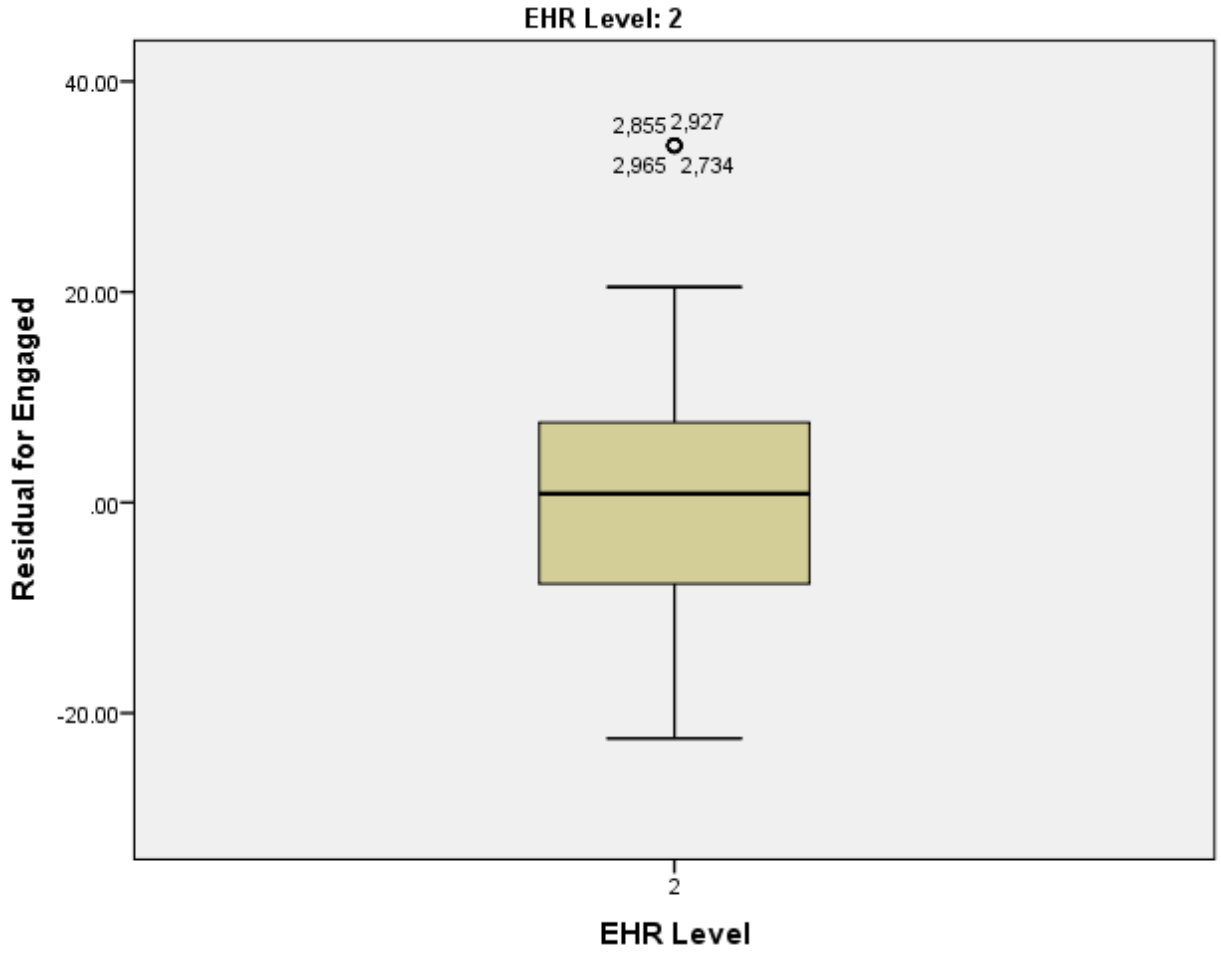

Detrended Normal Q-Q Plot of Residual for Engaged
EHR Level= 1. for EHR= 1
Dev from Normal
1.0
0.5
0.0
-40
-20
0
20
40
60
Observed Value


Detrended Normal Q-Q Plot of Residual for Engaged
EHR Level= 2. for EHR= 2
Dev from Normal
1.00
0.75
0.50
0.25
0.00
-0.25
-20
0
20
40
Observed Value

Boxplots

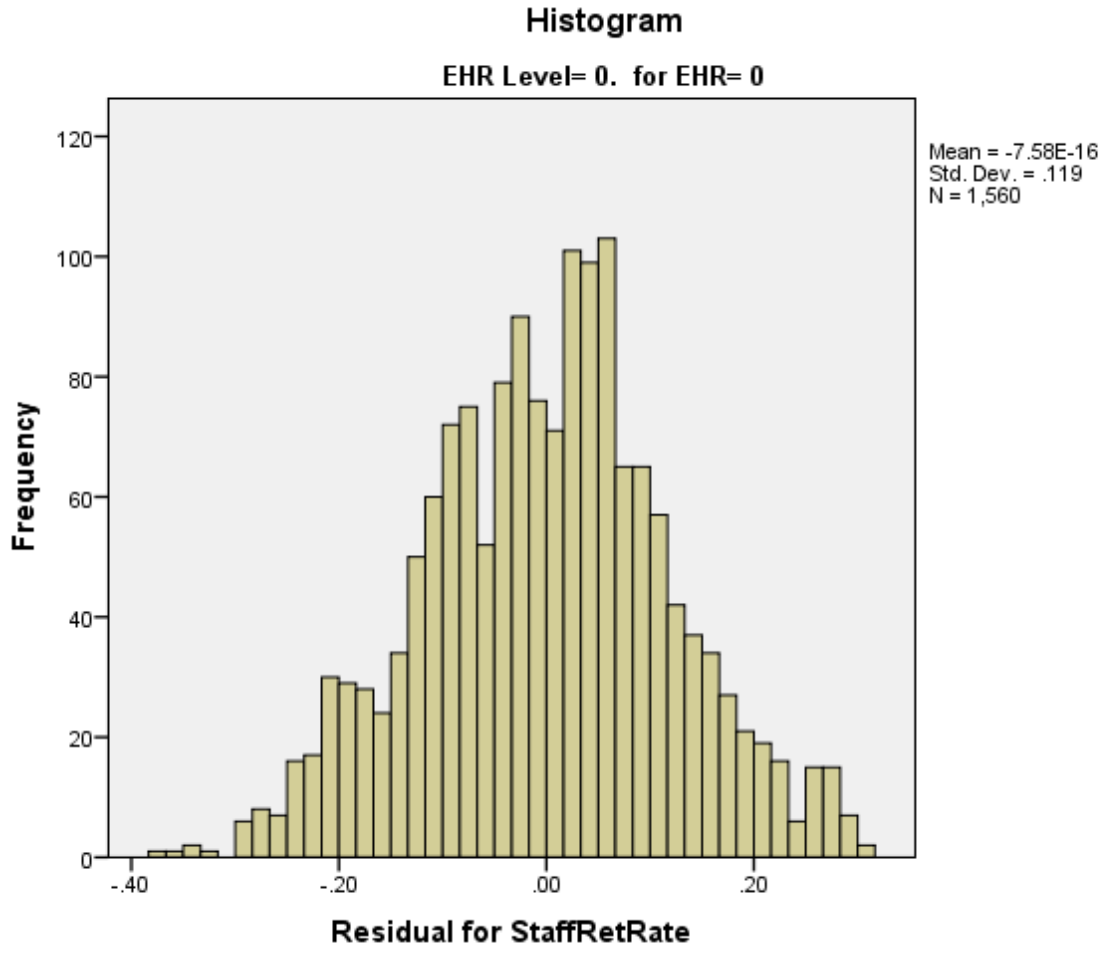

EHR Level: 0
Residual for Engaged
60.00
40.00
20.00
.00
-20.00
-40.00
89
296
193
545
43
452
1,203
1,281
707
822
771
0
EHR Level

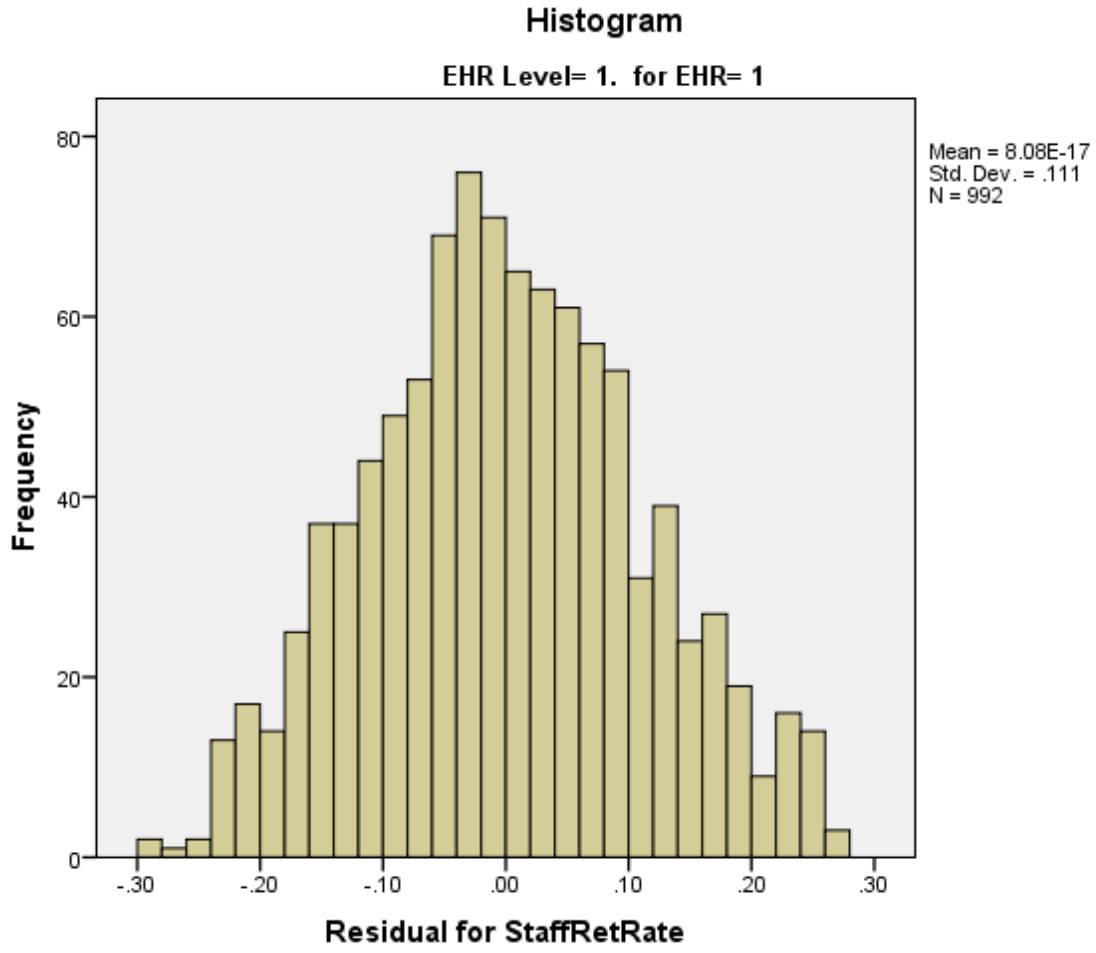

EHR Level: 1
60.00
40.00
20.00
.00
-20.00
-40.00
Residual for Engaged
1,963
2,311
1,733
1,846
1,789
2,022
1,904
2,199
1,863
2,497
1,921
2,157
1
EHR Level

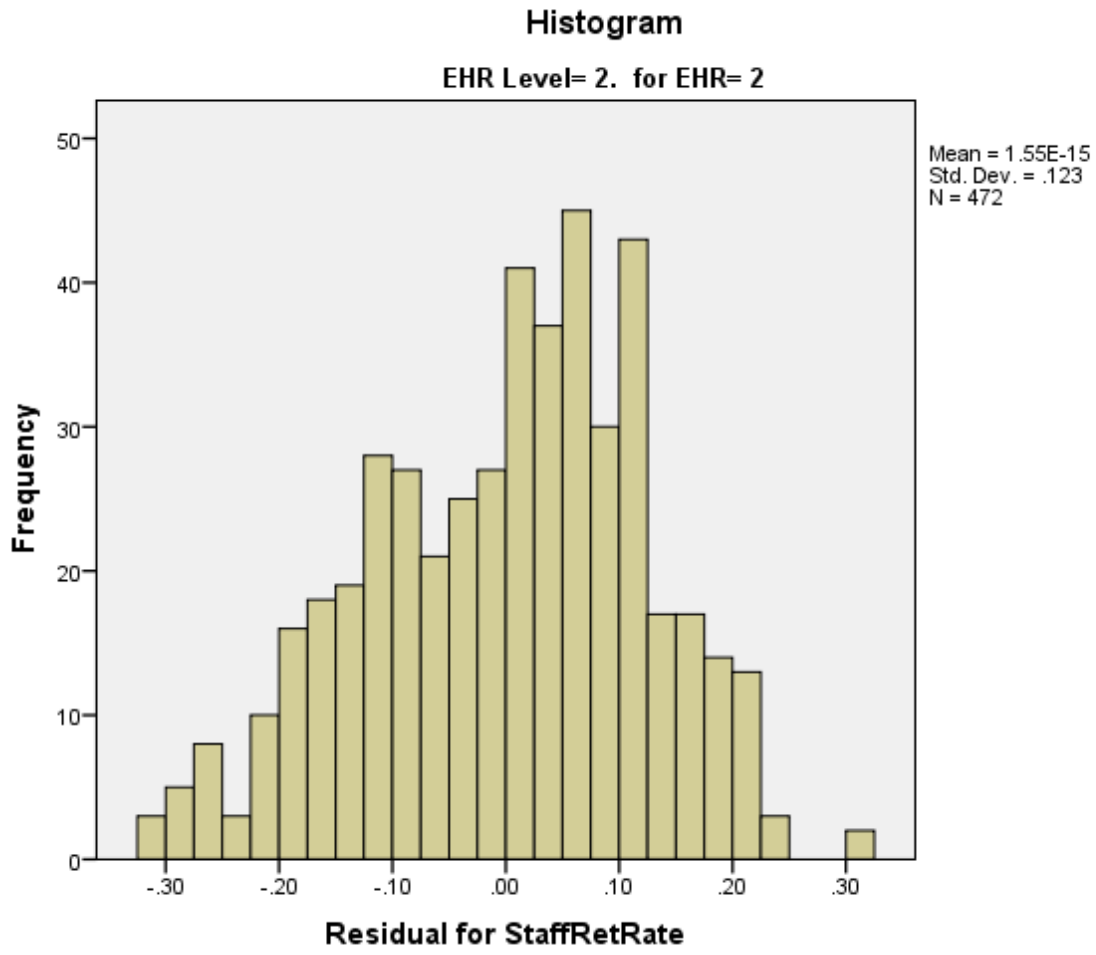


Residual for StaffRetRate

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = -7.58E-16
Std. Dev. = .119
N = 1,560
Frequency
120
100
80
60
40
20
0
-.40
-.20
.00
.20
Residual for StaffRetRate


Histogram
EHR Level= 1. for EHR= 1
Mean = 8.08E-17
Std. Dev. = .111
N = 992
Frequency
80
60
40
20
0
-.30
-.20
-.10
.00
.10
.20
.30
Residual for StaffRetRate



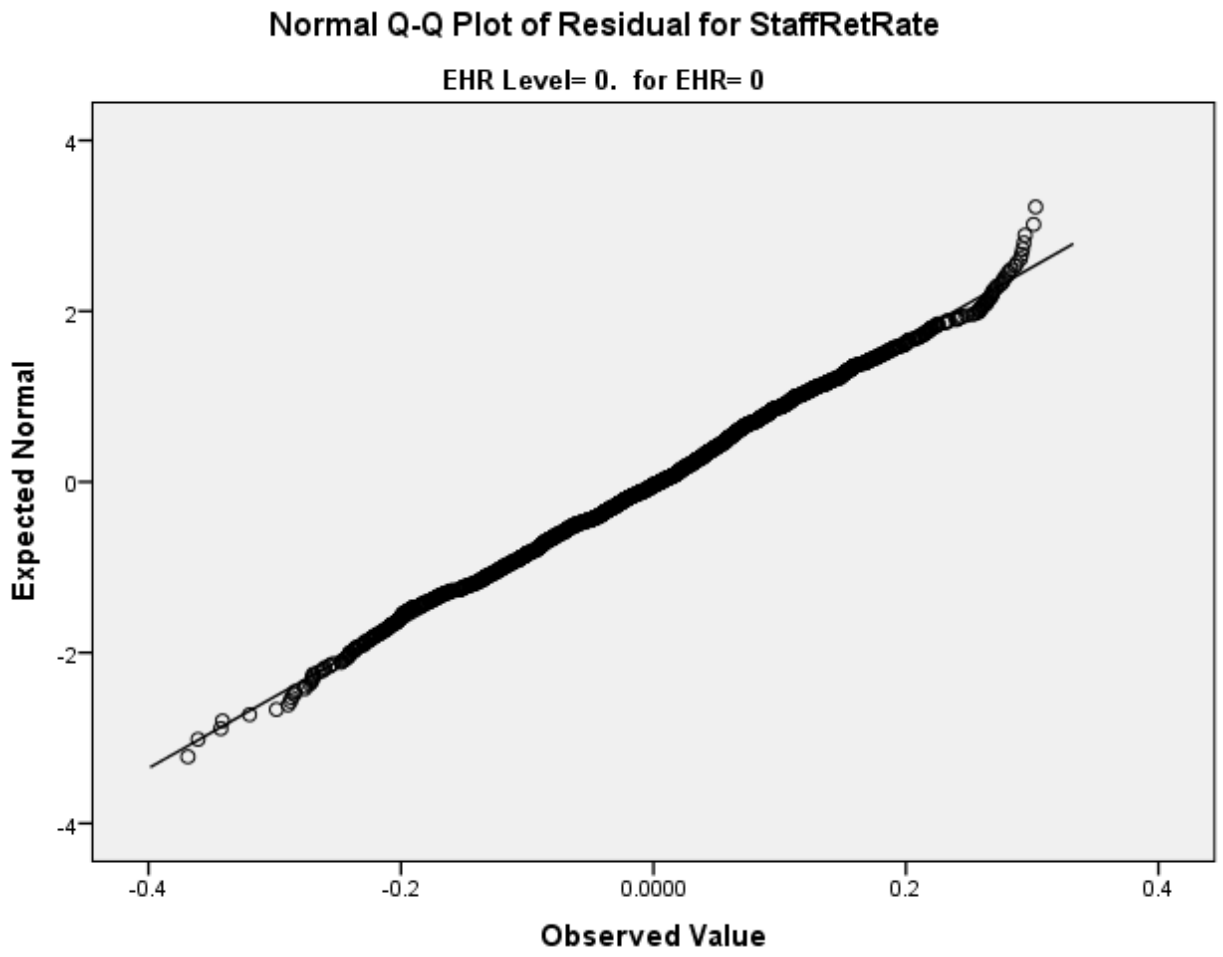
Stem-and-Leaf Plots

```
Residual for StaffRetRate Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     5.00 Extremes    (=<-.32)
    21.00       -2 .  5667788&
    63.00       -2 .  00000001111222334444
    81.00       -1 .  555566666777777888899999999
   144.00       -1 .  000000000000011111111111222222222333333333444444
   199.00       -0 .
55555555666666666666666777777777777778888888888888888999999999999
   245.00       -0 .
000000000000000001111111111111112222222222222222223333333333333333444444
4444444444
   271.00        0 .
000000000000000111111111111111112222222222222222223333333333333333333333
```

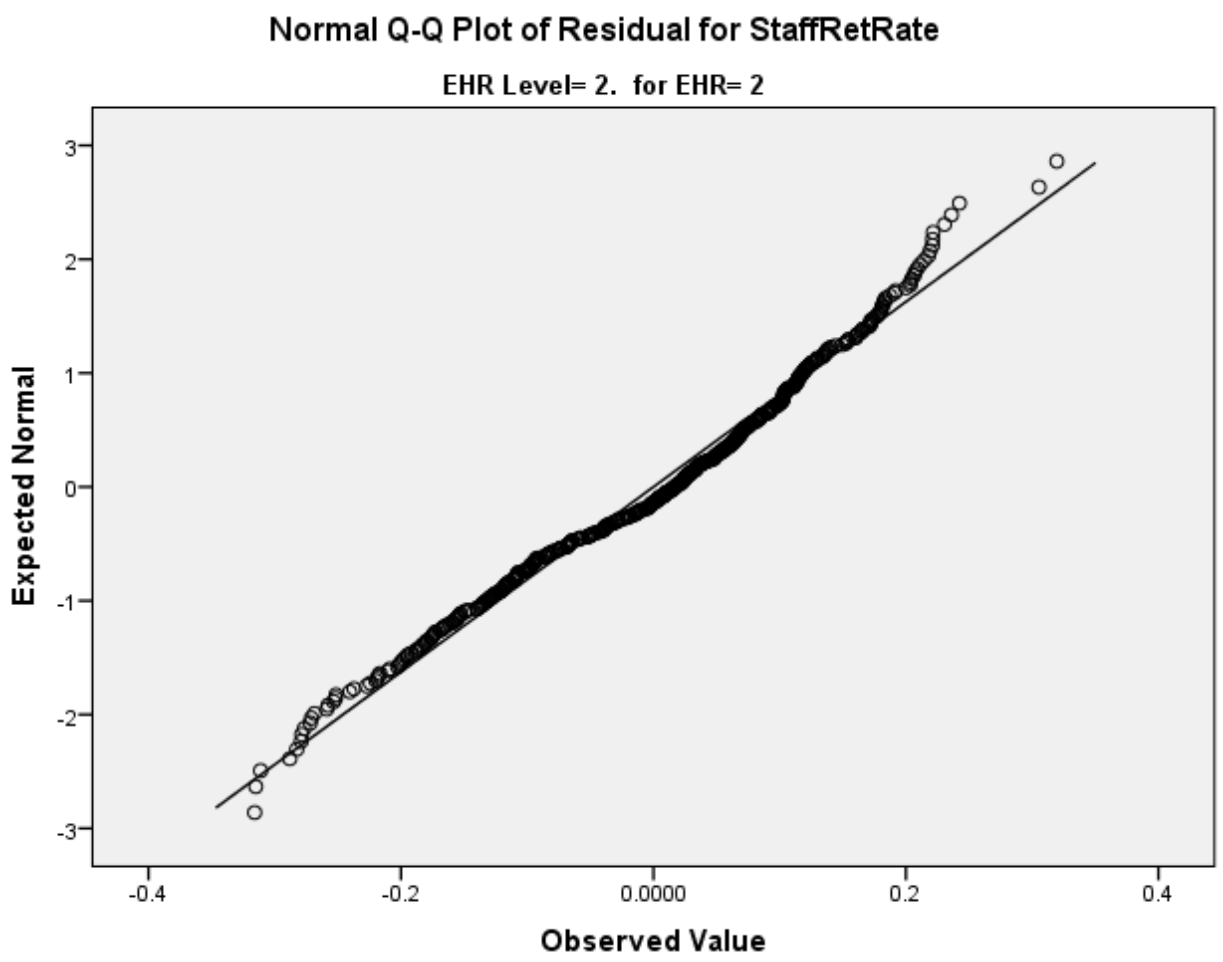
```
444444444444444444
   233.00        0 .
555555555555555555556666666666666666666677777777777888888888888899999
999999
   136.00        1 .  000000000000011111111122222222233333334444444
    82.00        1 .  55555555566667777888889999
    41.00        2 .  00011111223344
    37.00        2 .  5556666778899
     2.00        3 .  0

 Stem width:       .10
 Each leaf:        3 case(s)



 & denotes fractional leaves.



Residual for StaffRetRate Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     5.00       -2 .  5&
    30.00       -2 .  00011111222223
    57.00       -1 .  55555555566666666677888889
   100.00       -1 .  000000000000111111111122222222333333333344444444
   136.00       -0 .
555555555555555556666666666667777777777777888888888999999999999999
   182.00       -0 .
000000000000000000000111111111111112222222222222222222233333333333333333
344444444444444444
   160.00        0 .
000000000000000011111111111111112222222222222222222233333333334444444444
44444444
   140.00        0 .
555555555555556666666666666666677777777777888888888888888999999999999
    81.00        1 .  000000011111111222222222233333333344444
    59.00        1 .  55555566666677777777888889999
    33.00        2 .  011122223334444
     9.00        2 .  5556&

 Stem width:       .10
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for StaffRetRate Stem-and-Leaf Plot for
```

```
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     3.00       -3 .  111
    13.00       -2 .  5555567777788
    13.00       -2 .  0000111112234
    34.00       -1 .  55555555566666777777888888899999
    47.00       -1 .  00000000000011111111112222222223333333333444
    48.00       -0 .  55555556666666666677777788888889999999999999999
    52.00       -0 .
0000000000000111111111222222222333333333333334444444
    78.00        0 .
000000000000000011111111111111122222222222222222233333333333333344444
4444444
    75.00        0 .
555555555555555666666666666666666666777777777777788888888888999999999
9999
    60.00        1 .
000000000000000000011111111111111111122222222223333333344
    31.00        1 .  55556666666777777788888888999
    16.00        2 .  0000001111222334
      .00        2 .
     2.00        3 .  01

 Stem width:       .10
 Each leaf:       1 case(s)
```

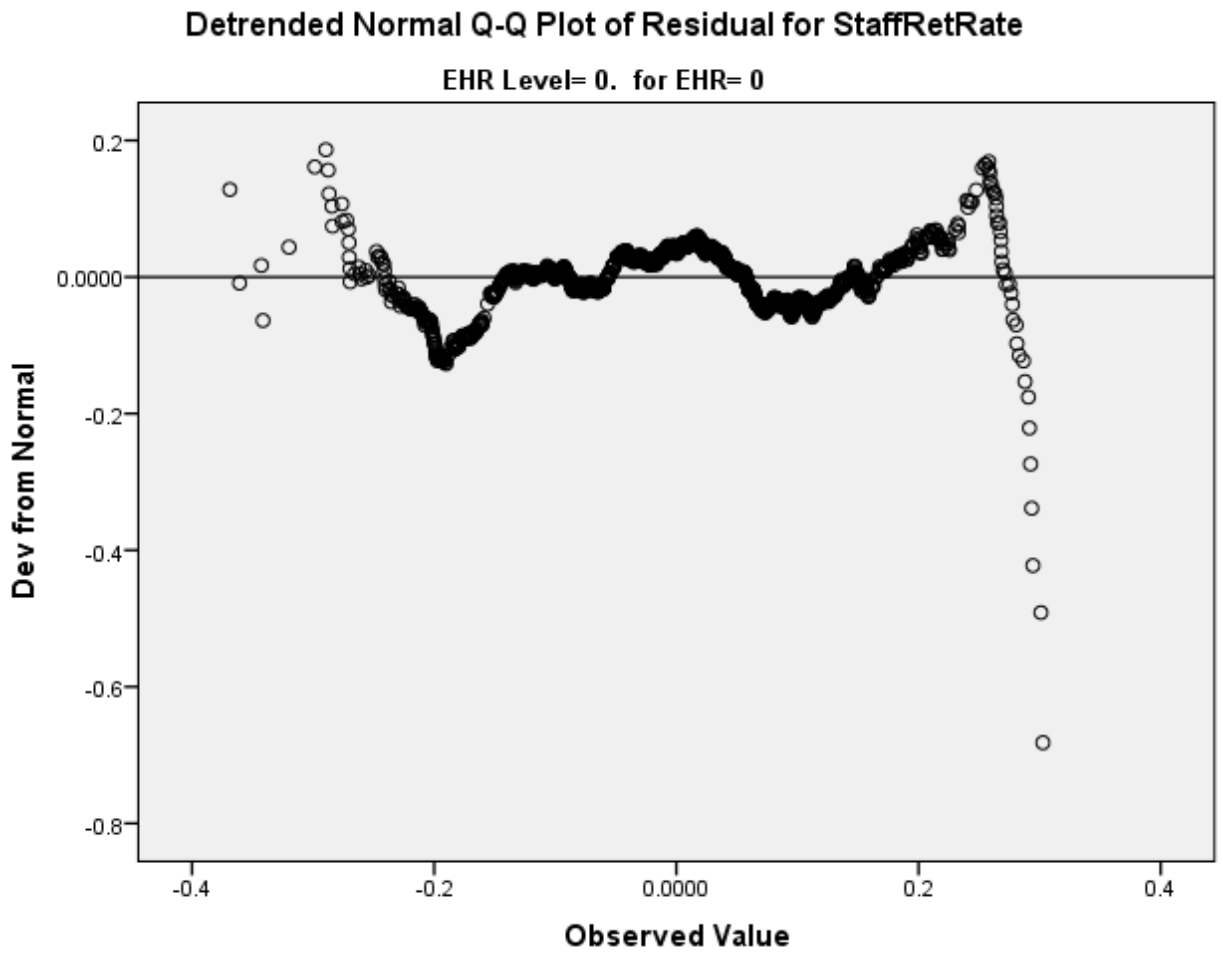
Normal Q-Q Plots

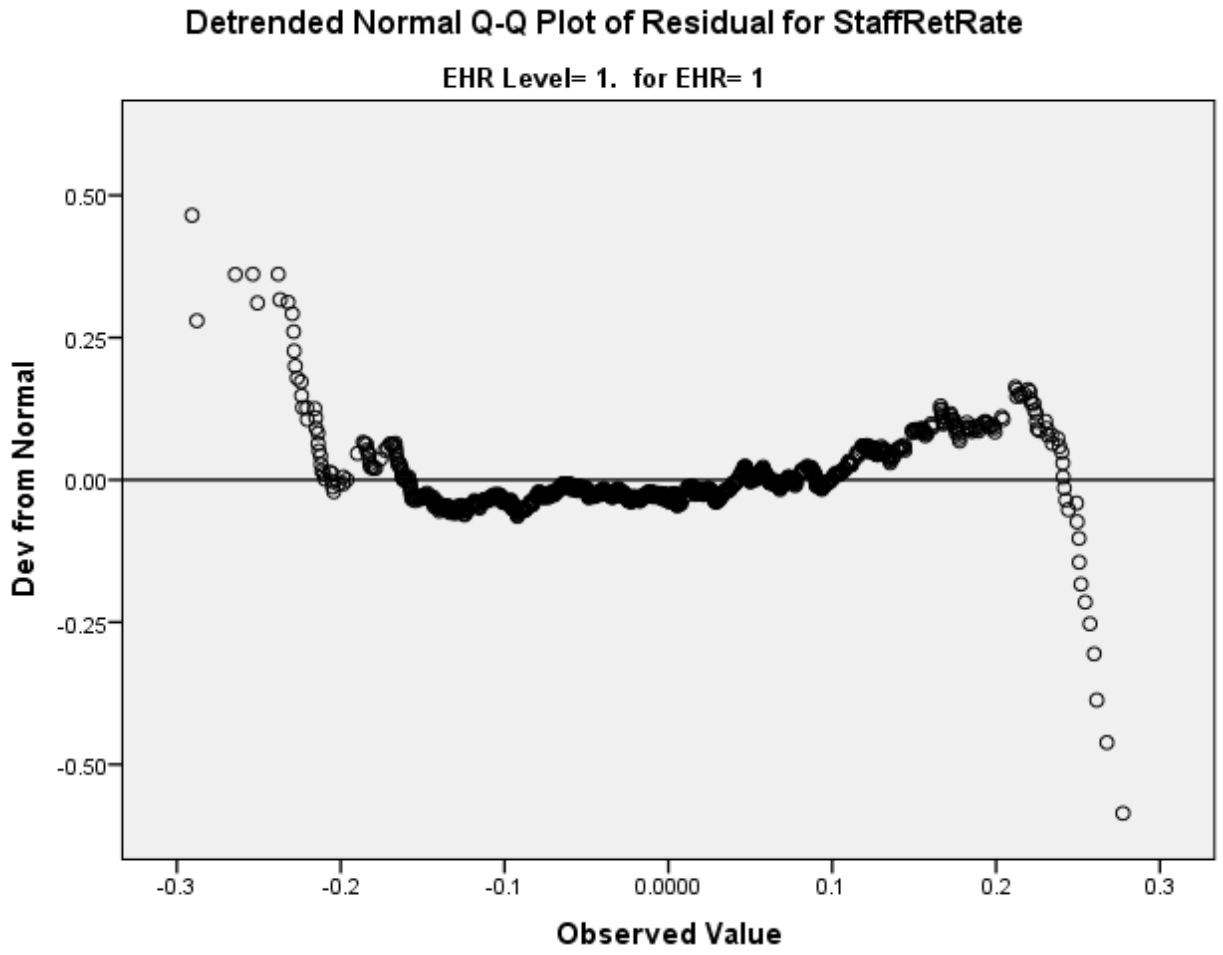

Normal Q-Q Plot of Residual for StaffRetRate
EHR Level= 0. for EHR= 0
Expected Normal
4
2
0
-2
-4
-0.4
-0.2
0.0000
0.2
0.4
Observed Value

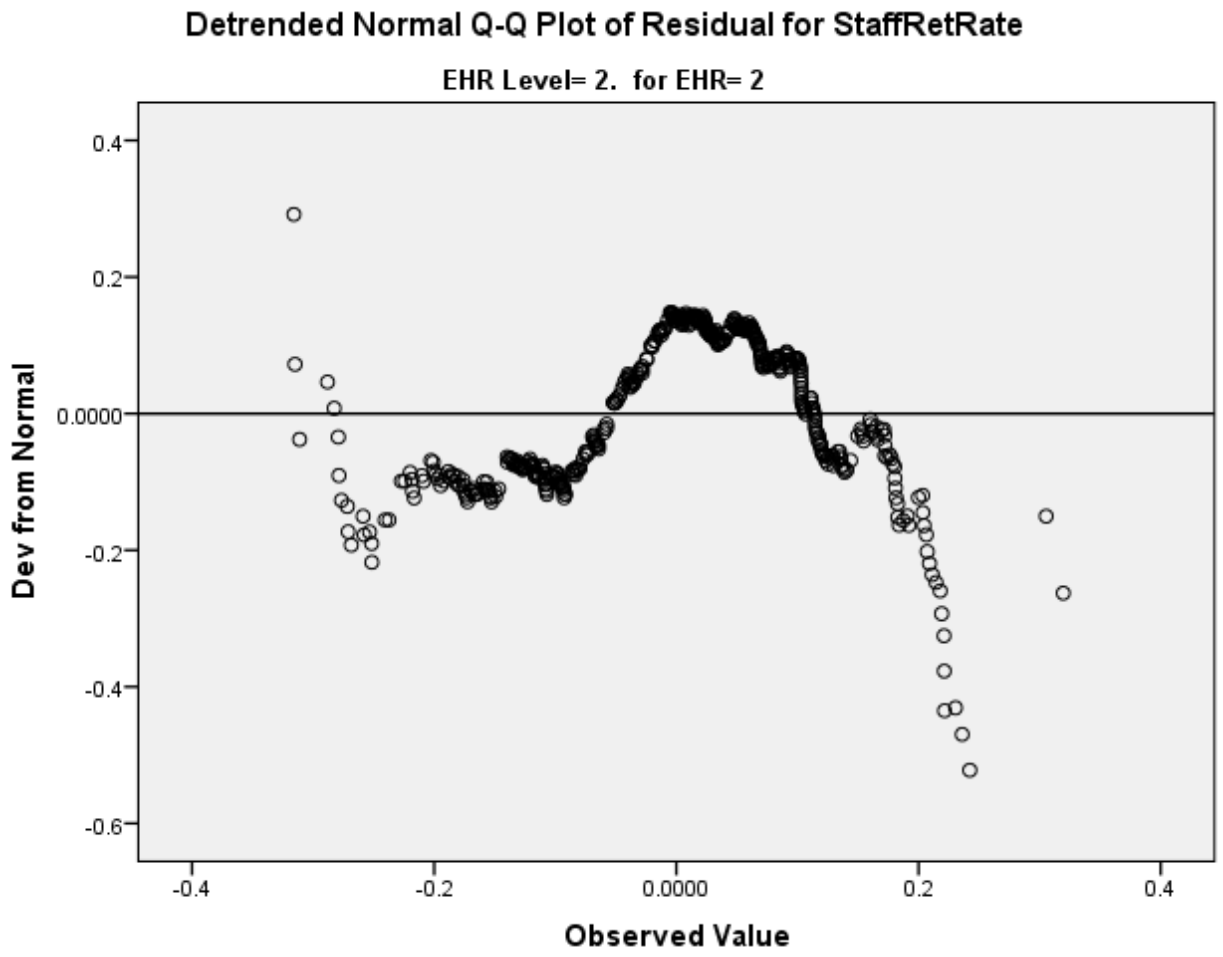
Normal Q-Q Plot of Residual for StaffRetRate
EHR Level= 1. for EHR= 1
Expected Normal
4
2
0
-2
-4
-0.4
-0.2
0.0000
0.2
0.4
Observed Value



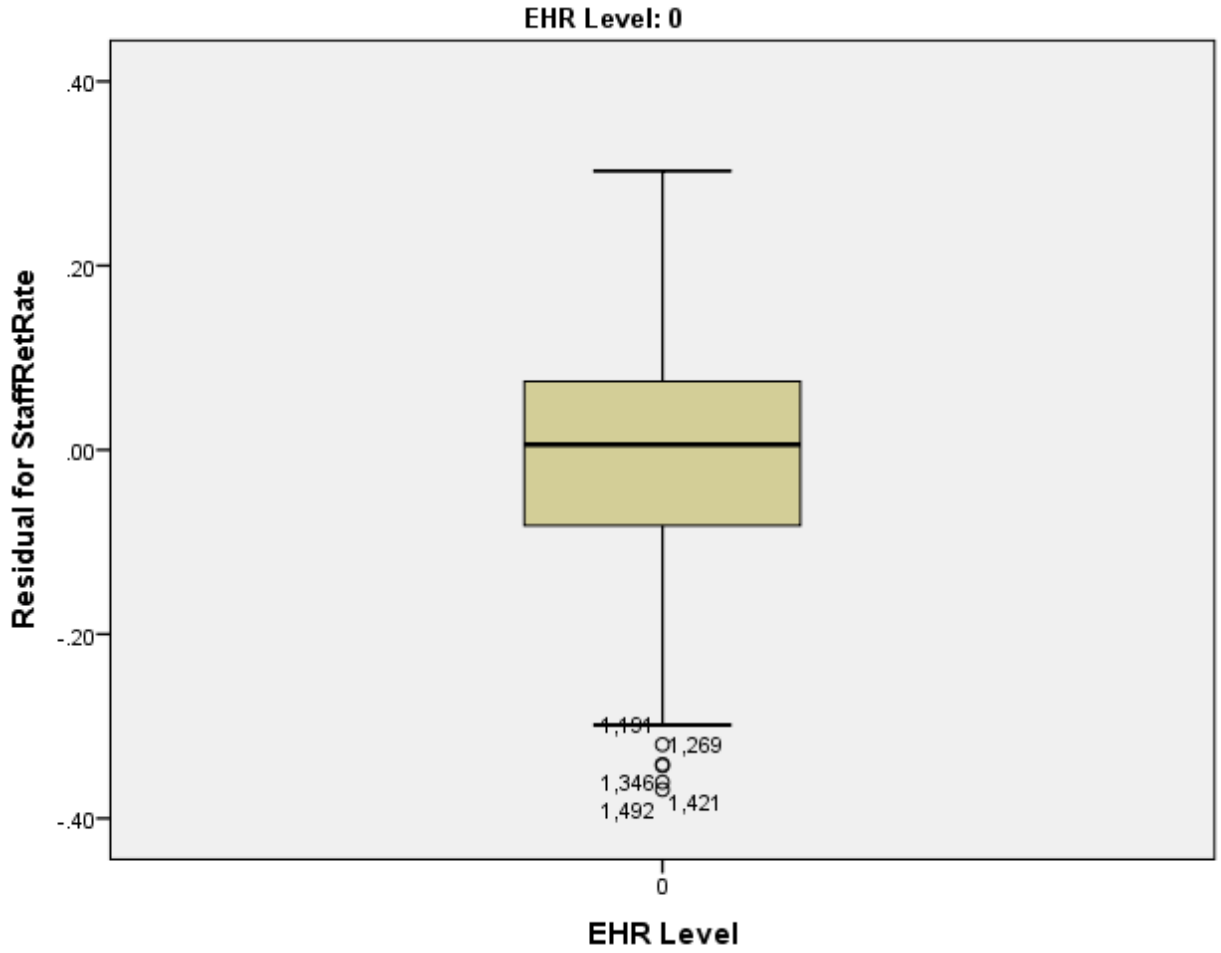
Detrended Normal Q-Q Plots

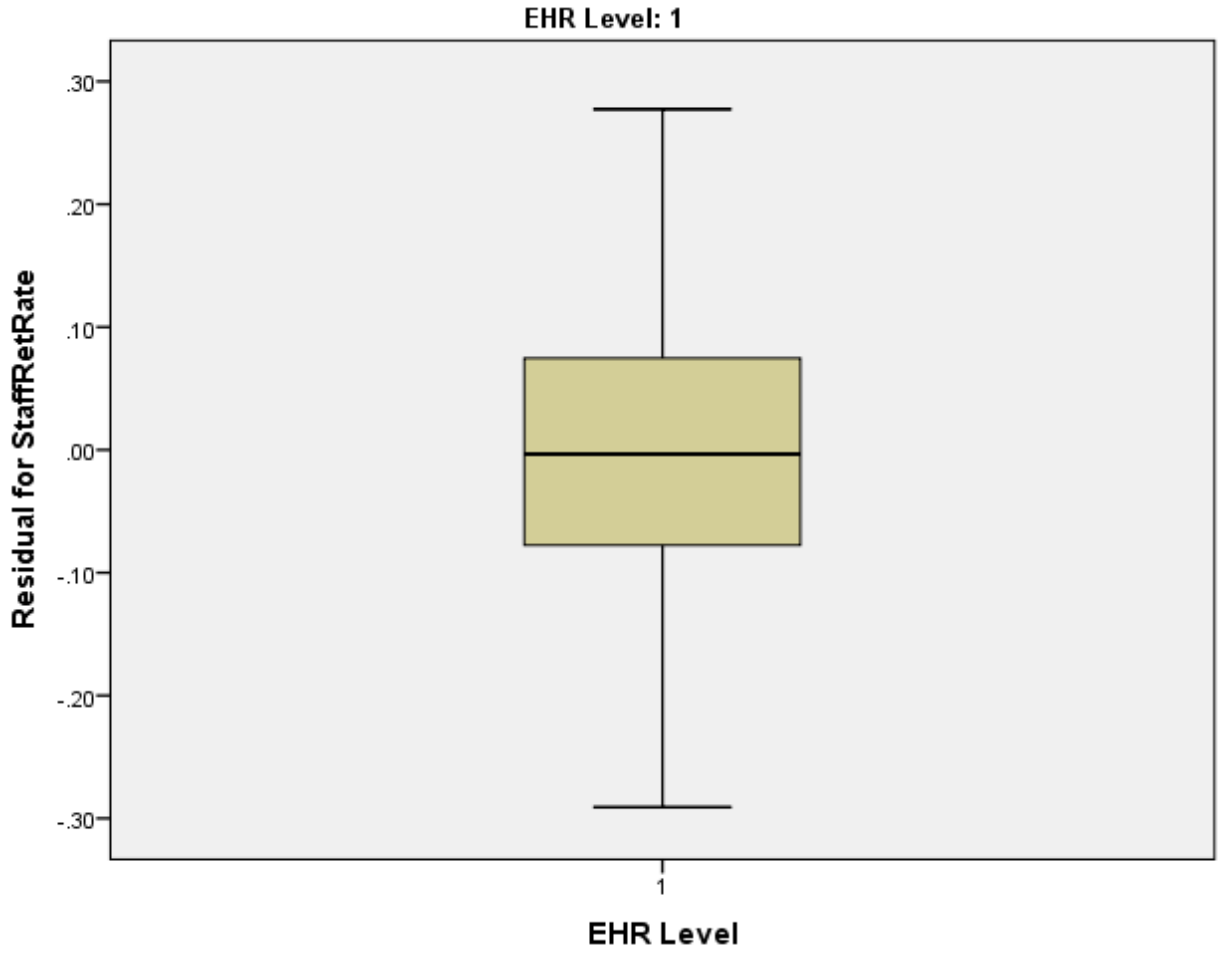

Detrended Normal Q-Q Plot of Residual for StaffRetRate
EHR Level= 0. for EHR= 0
Dev from Normal
0.2
0.0000
-0.2
-0.4
-0.6
-0.8
-0.4
-0.2
0.0000
0.2
0.4
Observed Value

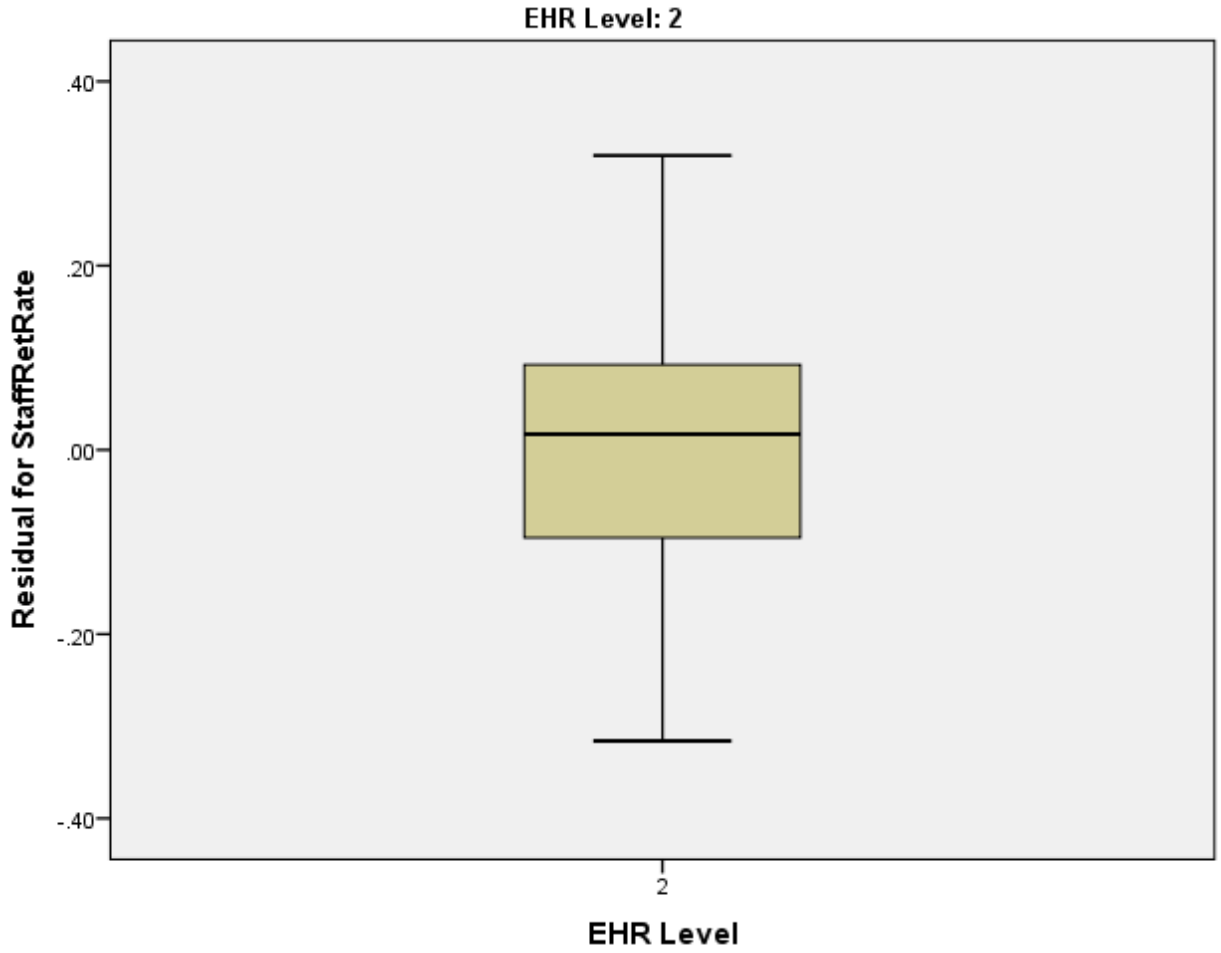

Detrended Normal Q-Q Plot of Residual for StaffRetRate
EHR Level= 1. for EHR= 1
Dev from Normal
0.50
0.25
0.00
-0.25
-0.50
-0.3
-0.2
-0.1
0.0000
0.1
0.2
0.3
Observed Value


Detrended Normal Q-Q Plot of Residual for StaffRetRate
EHR Level= 2. for EHR= 2
Dev from Normal
0.4
0.2
0.0000
-0.2
-0.4
-0.6
-0.4
-0.2
0.0000
0.2
0.4
Observed Value

Boxplots

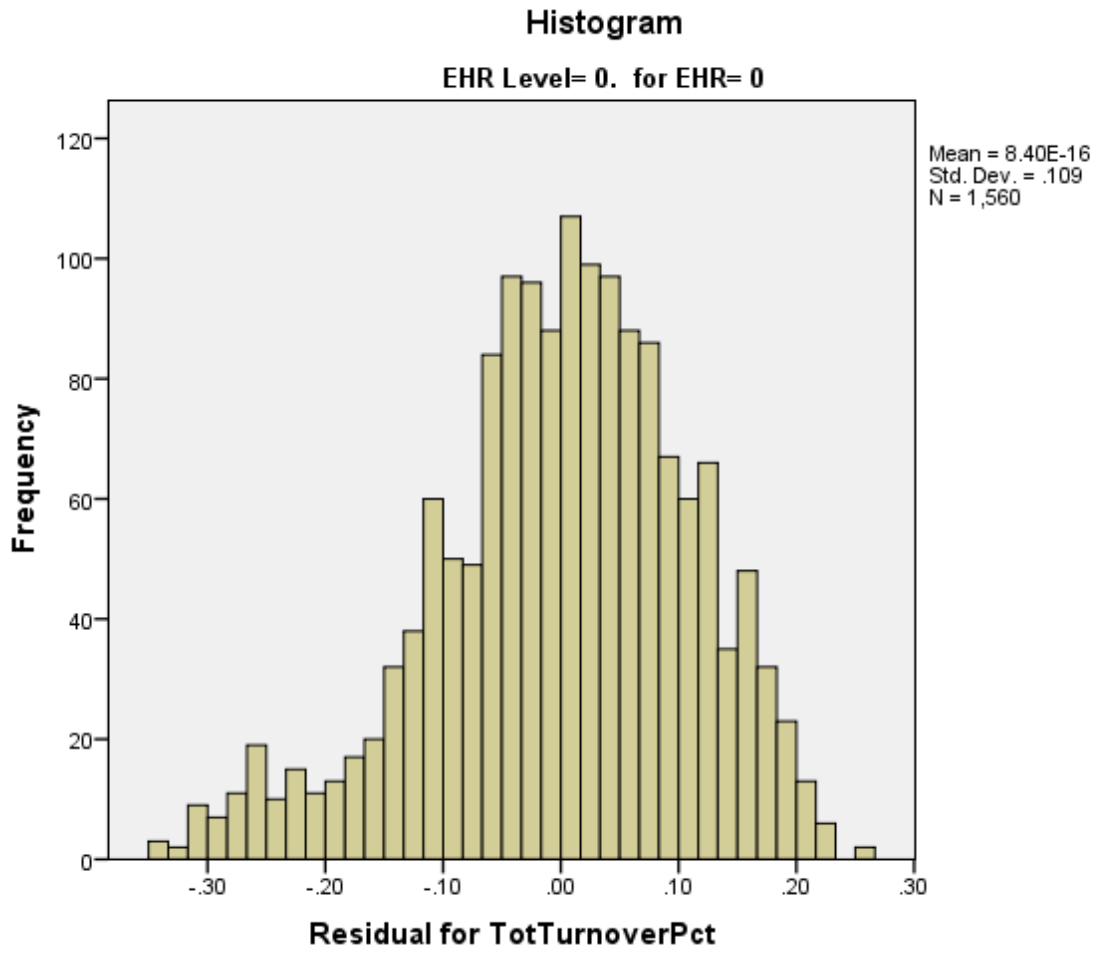

EHR Level: 0
Residual for StaffRetRate
.40
.20
.00
-.20
-.40
1,269
1,346
1,492
1,421
0
EHR Level

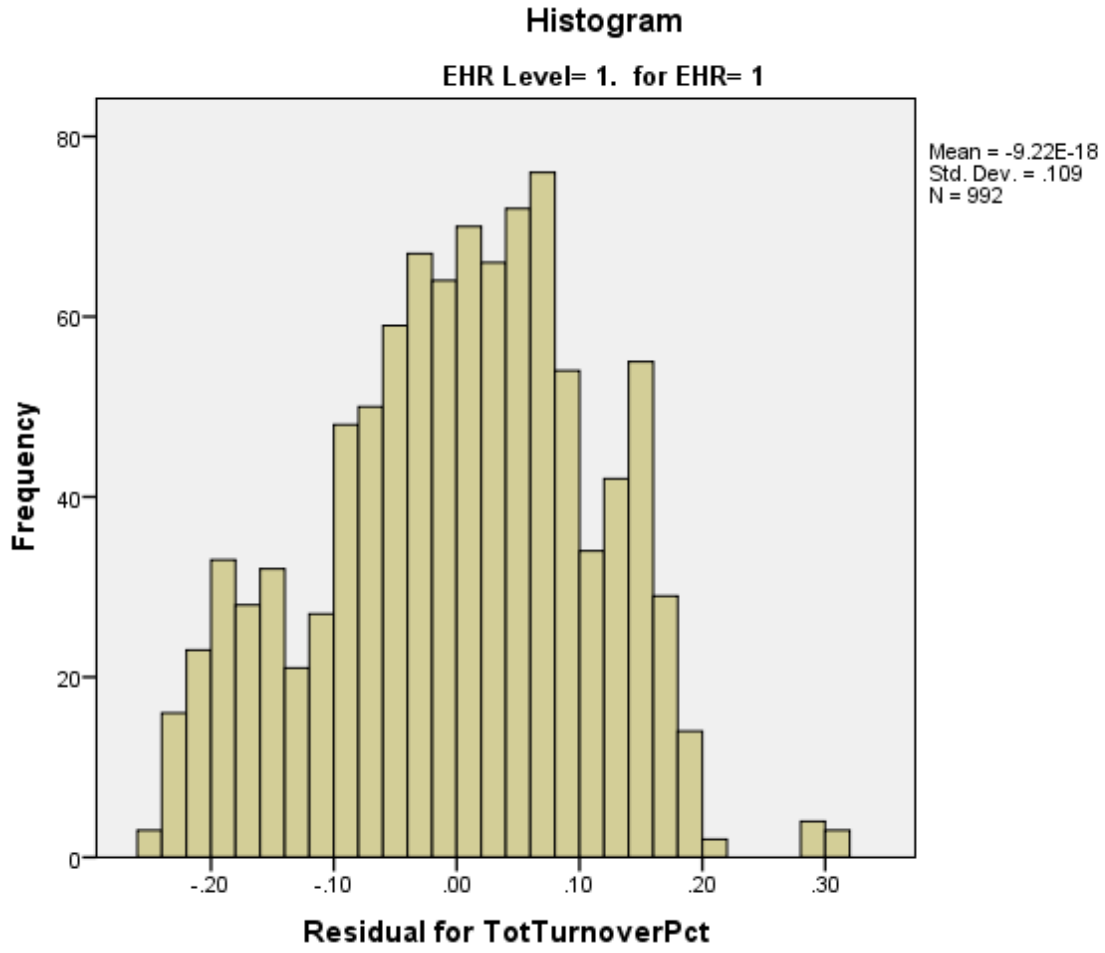

EHR Level: 1
Residual for StaffRetRate
.30
.20
.10
.00
-.10
-.20
-.30
1
EHR Level

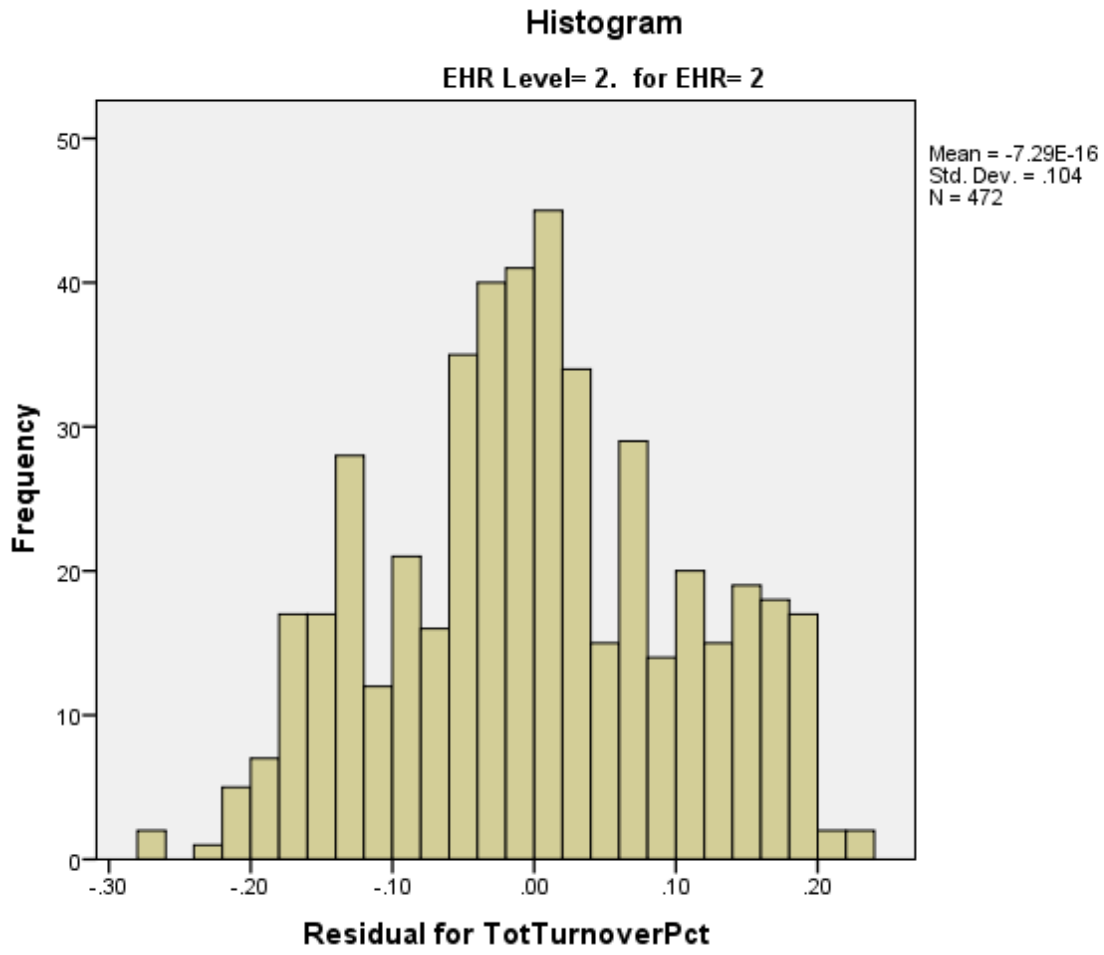


Residual for TotTurnoverPct

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 8.40E-16
Std. Dev. = .109
N = 1,560
Frequency
120
100
80
60
40
20
0
-.30
-.20
-.10
.00
.10
.20
.30
Residual for TotTurnoverPct


Histogram
EHR Level= 1. for EHR= 1
Mean = -9.22E-18
Std. Dev. = .109
N = 992
Frequency
80
60
40
20
0
-.20
-.10
.00
.10
.20
.30
Residual for TotTurnoverPct



Stem-and-Leaf Plots

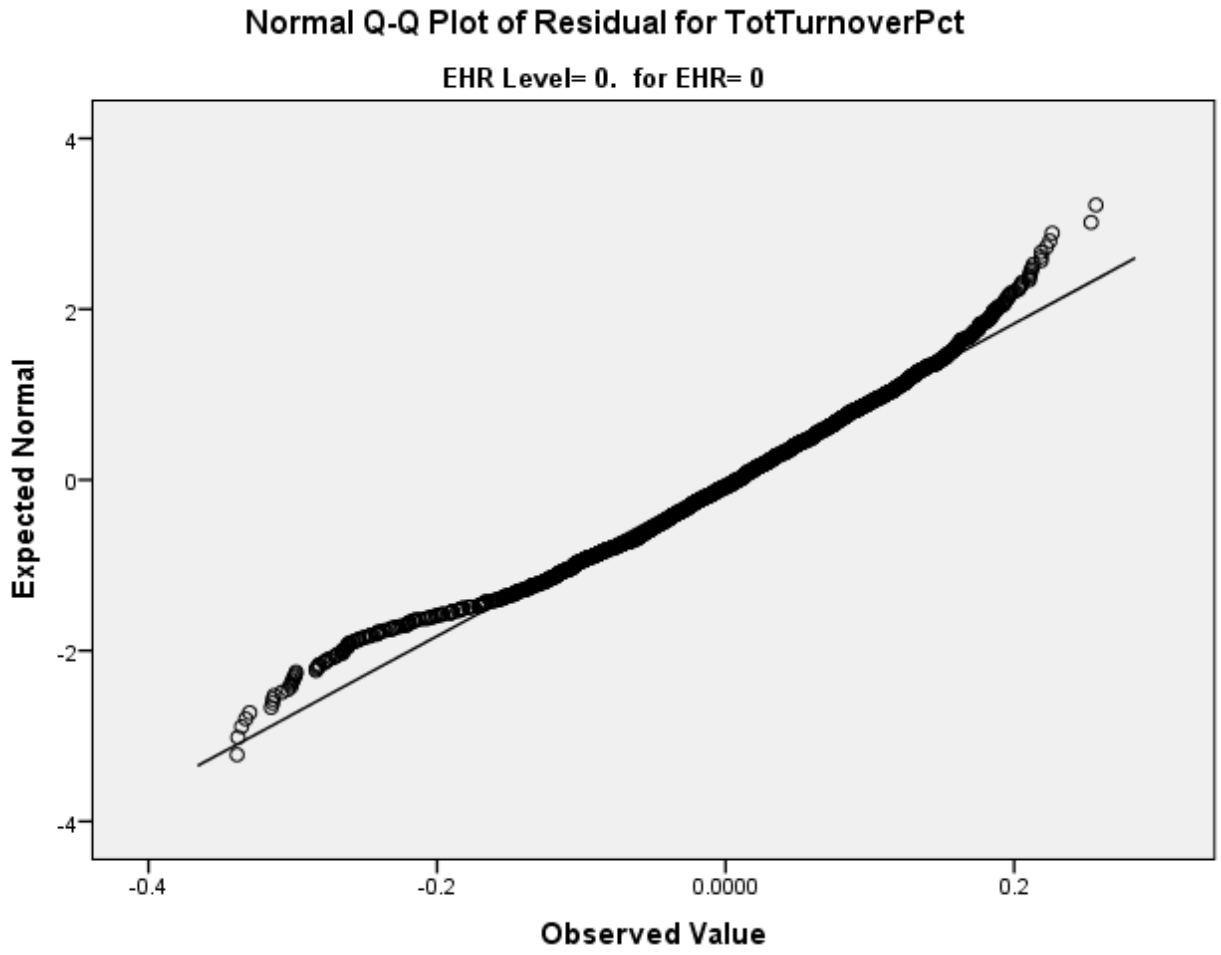
```
Residual for TotTurnoverPct Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

    32.00 Extremes    (=<-.27)
    12.00       -2 .  666666
    15.00       -2 .  4444555
    12.00       -2 .  222333
    16.00       -2 .  0001111
    17.00       -1 .  88888999
    19.00       -1 .  666666777
    30.00       -1 .  444444445555555
    44.00       -1 .  2222222222223333333333
    70.00       -1 .  0000000000000000000111111111111111
    59.00       -0 .  88888888888888899999999999999
    71.00       -0 .  66666666666666666677777777777777777
```

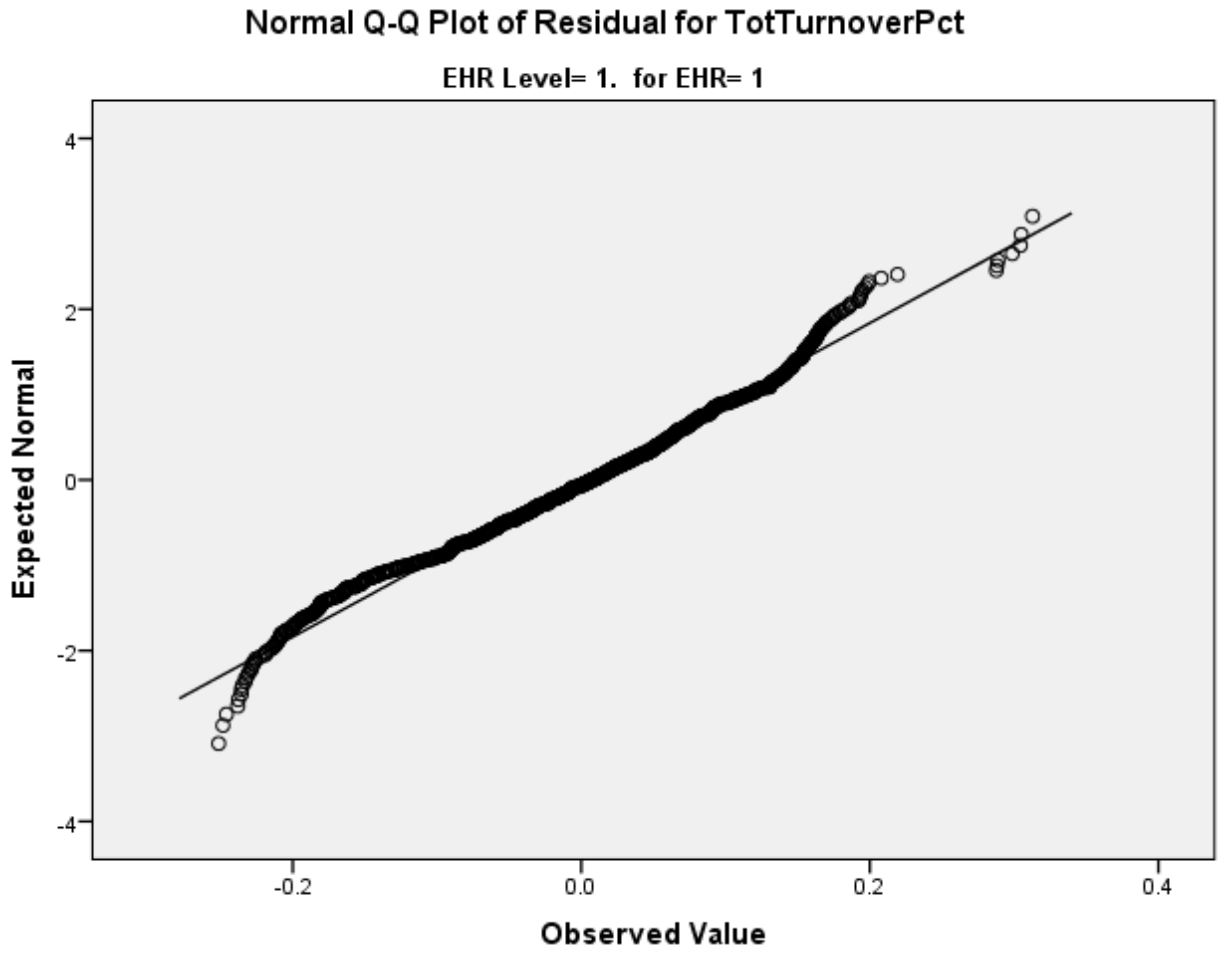
```
   110.00       -0 .
4444444444444444444444444445555555555555555555555555
   118.00       -0 .
22222222222222222222222222222333333333333333333333333
   106.00       -0 .
00000000000000000000000000011111111111111111111111
   131.00        0 .
000000000000000000000000000111111111111111111111111111111111
   113.00        0 .
22222222222222222222222222333333333333333333333333333
   101.00        0 .
444444444444444444444444444555555555555555555555
   115.00        0 .
66666666666666666666666666677777777777777777777777
    84.00        0 .  888888888888888888888999999999999999999
    73.00        1 .  00000000000000001111111111111111
    68.00        1 .  22222222222222222233333333333333
    52.00        1 .  44444444455555555555555
    42.00        1 .  666666666667777777
    29.00        1 .  88888888899999
    16.00        2 .  00011111
     3.00        2 .  2
     2.00        2 .  5

 Stem width:       .10
 Each leaf:        2 case(s)
```

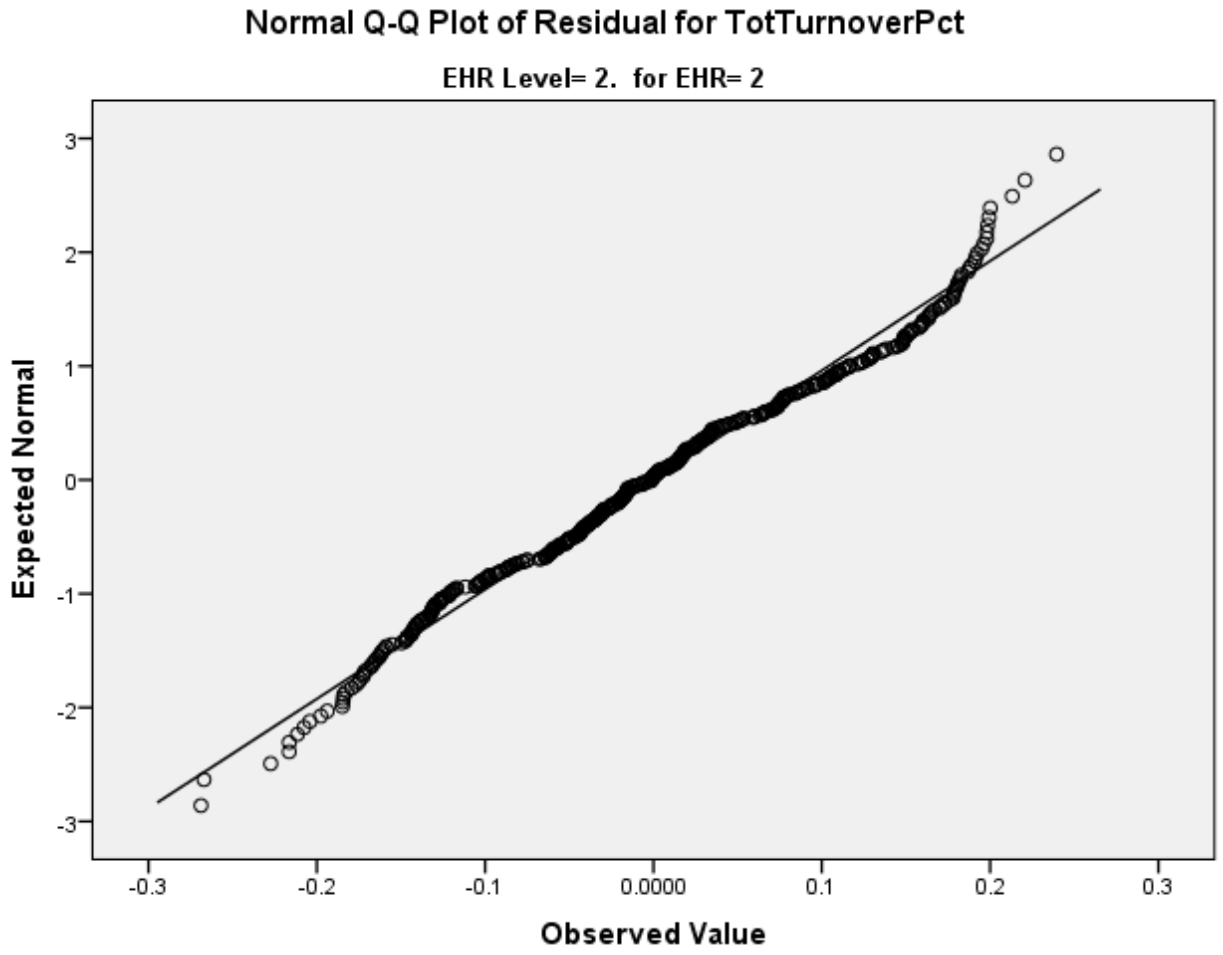
```
Residual for TotTurnoverPct Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     1.00       -2 .  &
    41.00       -2 .  0000001111122233334
    77.00       -1 .  55555555666666667777888888888999999
    64.00       -1 .  00000011111112222223333444444444
   131.00       -0 .
55555555555555556666666666666777777777777888888888888999999999999
   157.00       -0 .
00000000000000000111111111111112222222222222233333333333333333344444444
444444
   165.00        0 .
000000000000000011111111111111111112222222222222223333333333333333344
44444444444
   173.00        0 .
555555555555555555556666666666666666666677777777777777778888888888888
99999999999999
   105.00        1 .
000000001111111122222233333333333333344444444444444
    69.00        1 .  55555555555566666666667777889999
```

```
     2.00        2 .  &
     4.00        2 .  8&
     3.00 Extremes    (>=.30)

 Stem width:       .10
 Each leaf:        2 case(s)


 & denotes fractional leaves.



Residual for TotTurnoverPct Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     2.00       -2 .  6
     6.00       -2 .  01&
    27.00       -1 .  566666777889
    54.00       -1 .  000112222222333333344444444
    53.00       -0 .  55555555666666778888899999
   100.00       -0 .  000000011111111111122222222333333333333444444444
    87.00        0 .  00000000011111111111122222223333333334444
    50.00        0 .  55566667777777778888999
    45.00        1 .  000000111222233344444
    44.00        1 .  555566667777788889999
     4.00        2 .  &&

 Stem width:       .10
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

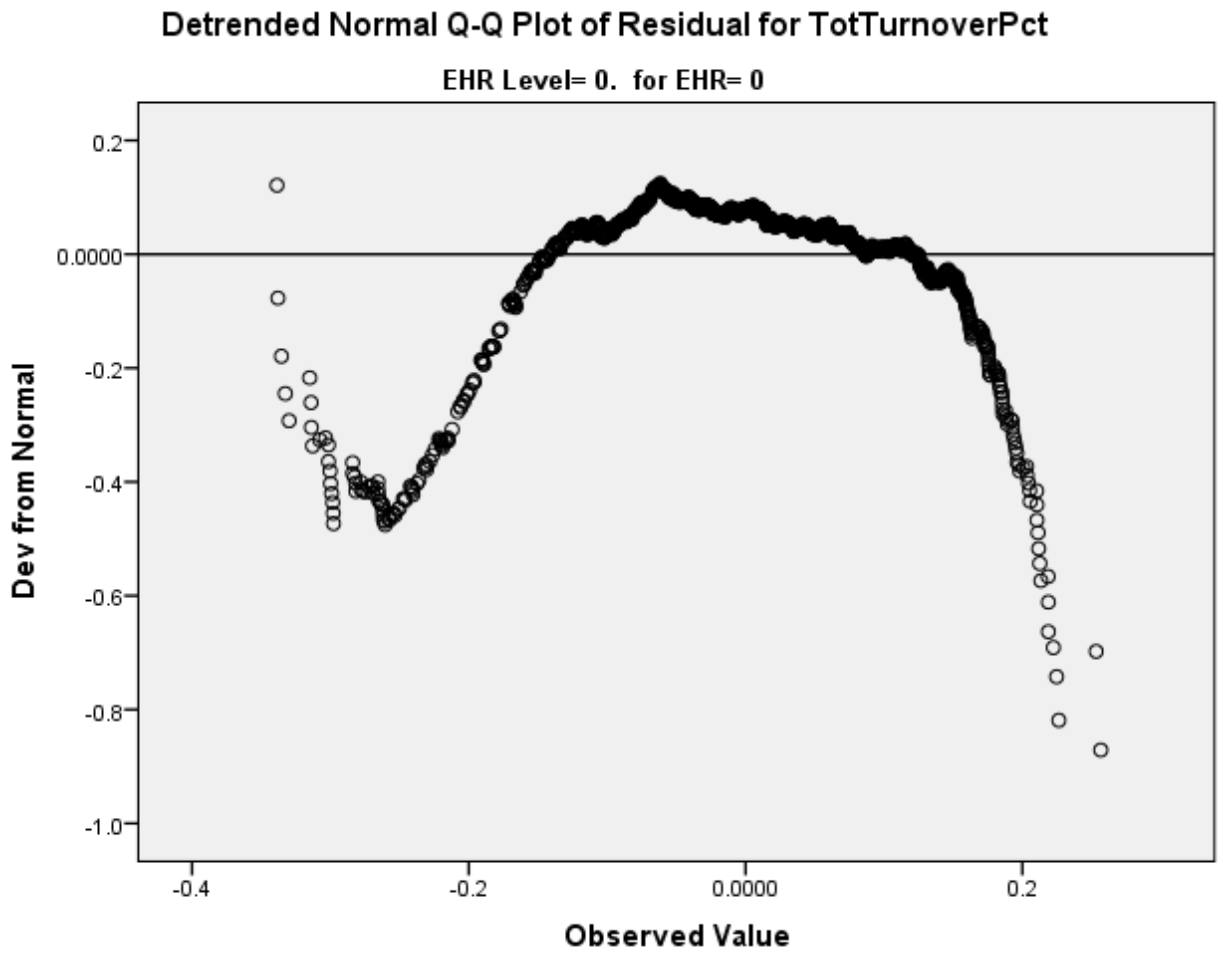
Normal Q-Q Plots

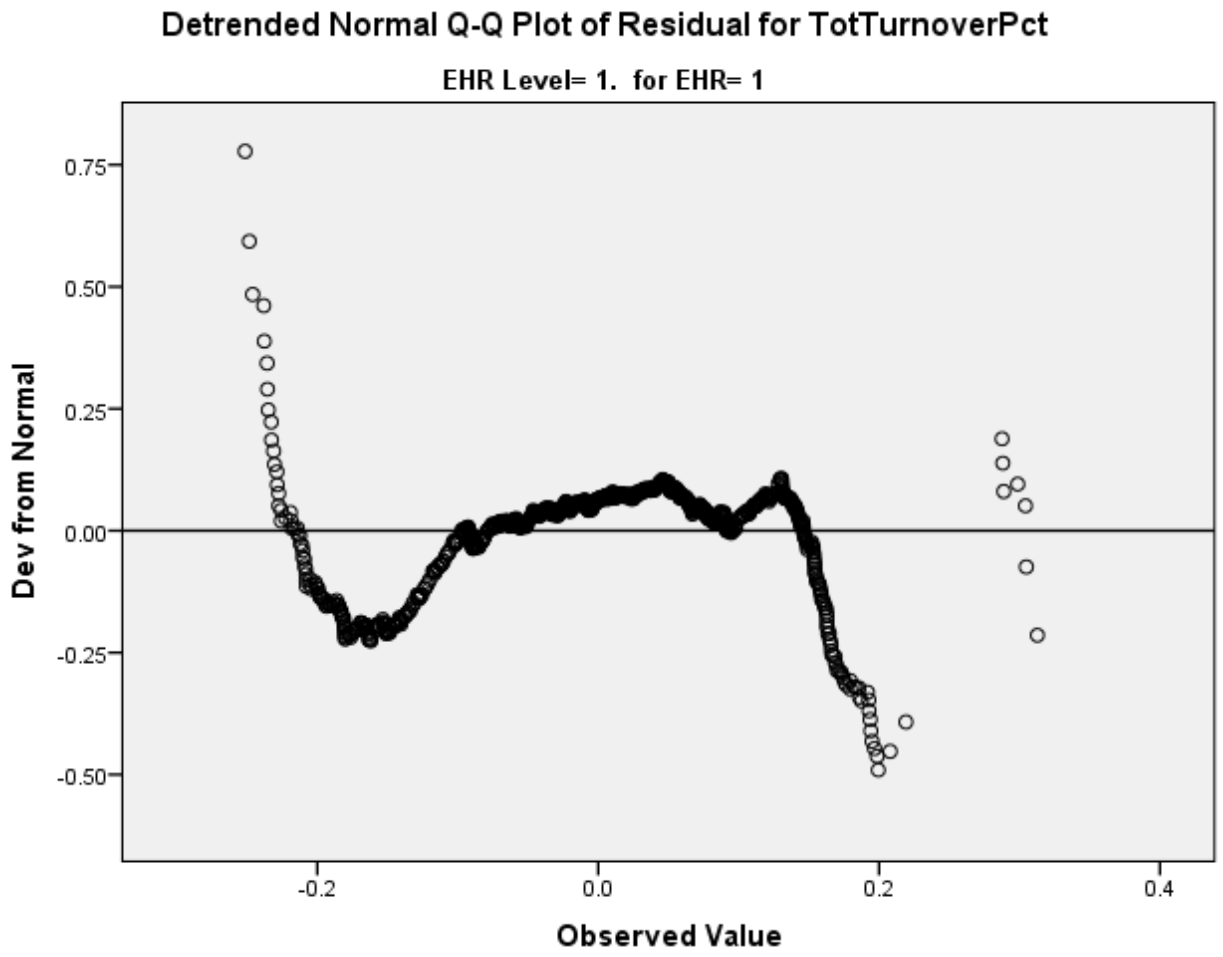

Normal Q-Q Plot of Residual for TotTurnoverPct
EHR Level= 0. for EHR= 0
Expected Normal
4
2
0
-2
-4
-0.4
-0.2
0.0000
0.2
Observed Value

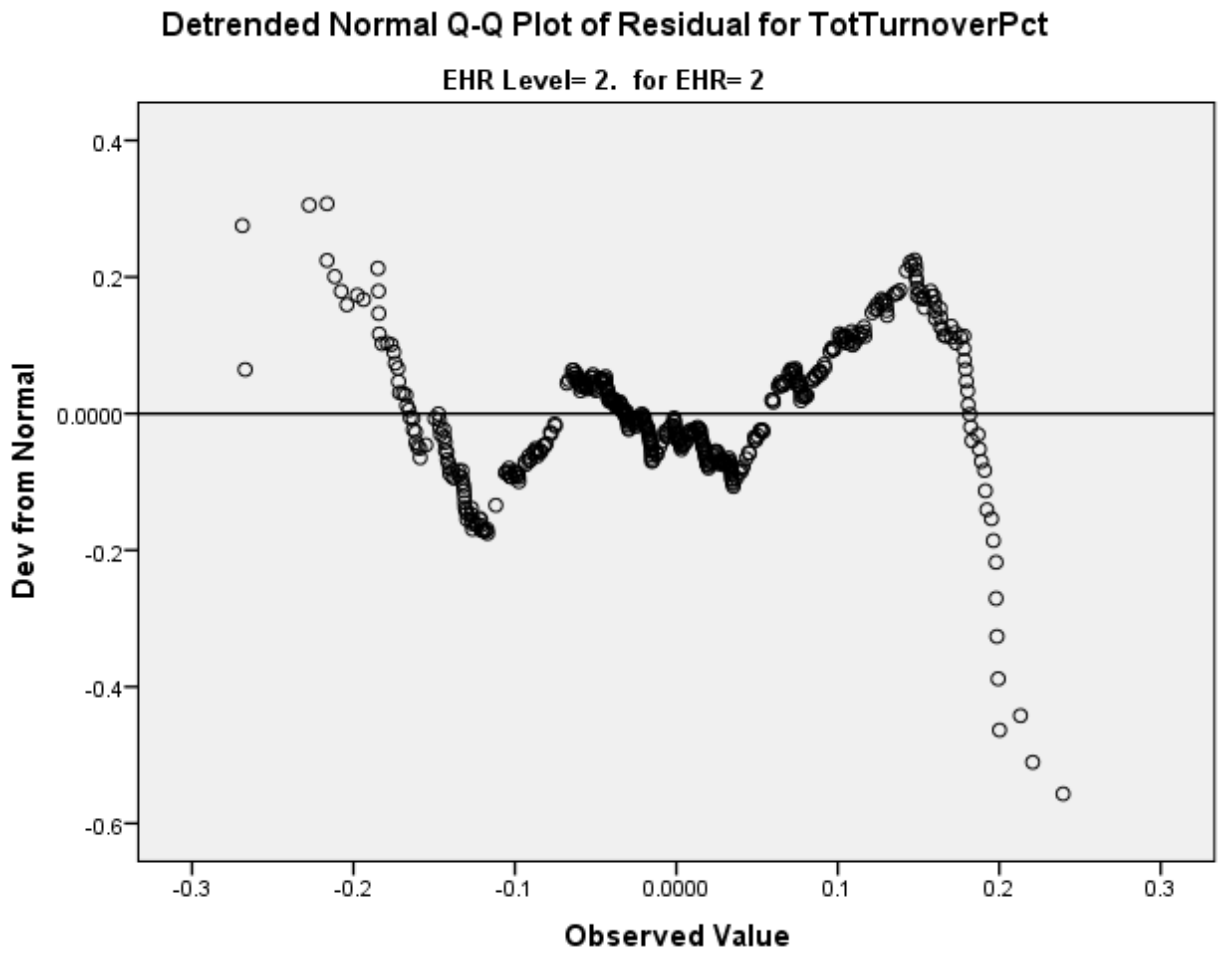

Normal Q-Q Plot of Residual for TotTurnoverPct
EHR Level= 1. for EHR= 1
Expected Normal
4
2
0
-2
-4
-0.2
0.0
0.2
0.4
Observed Value



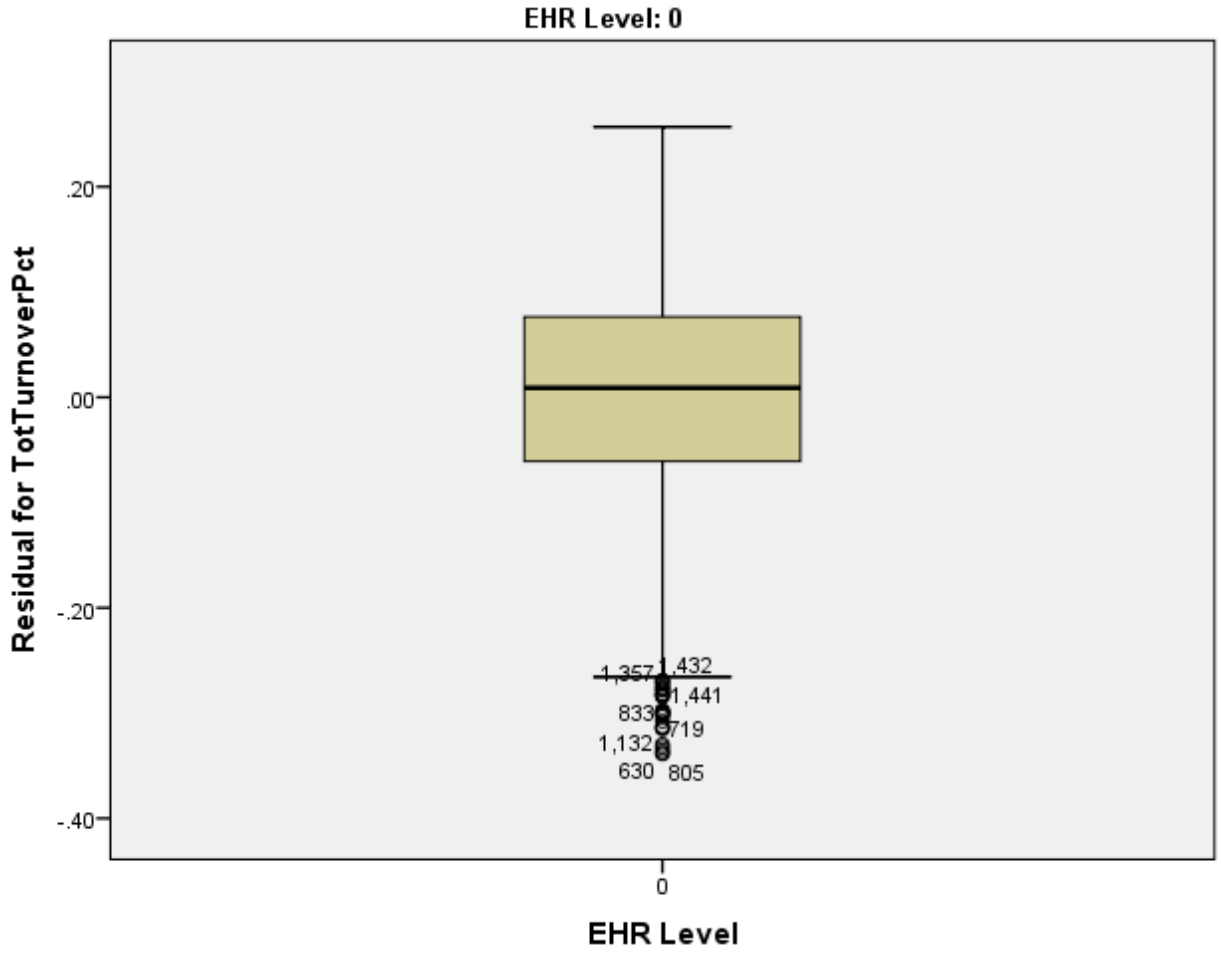
Detrended Normal Q-Q Plots

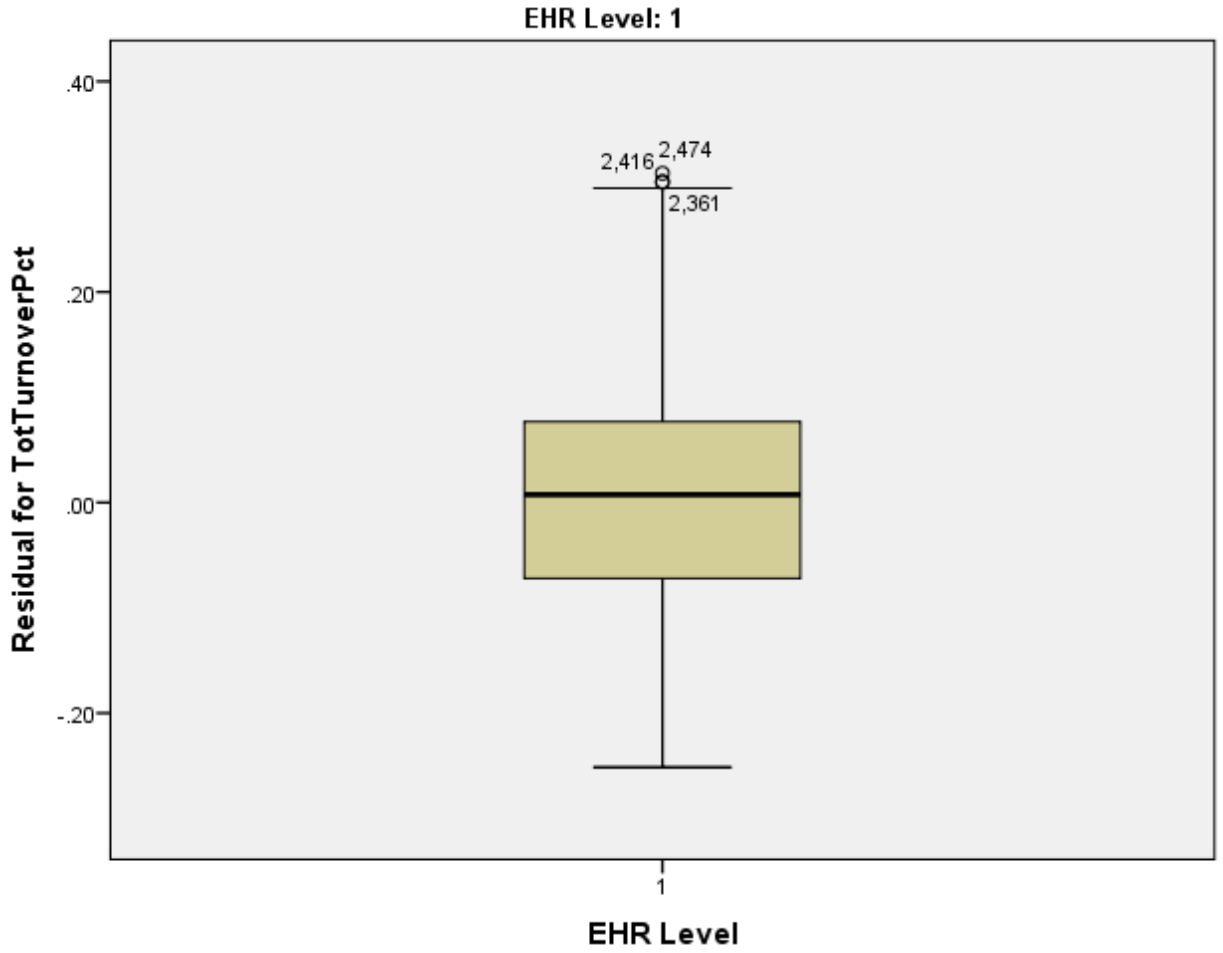

Detrended Normal Q-Q Plot of Residual for TotTurnoverPct
EHR Level= 0. for EHR= 0
Dev from Normal
0.2
0.0000
-0.2
-0.4
-0.6
-0.8
-1.0
-0.4
-0.2
0.0000
0.2
Observed Value

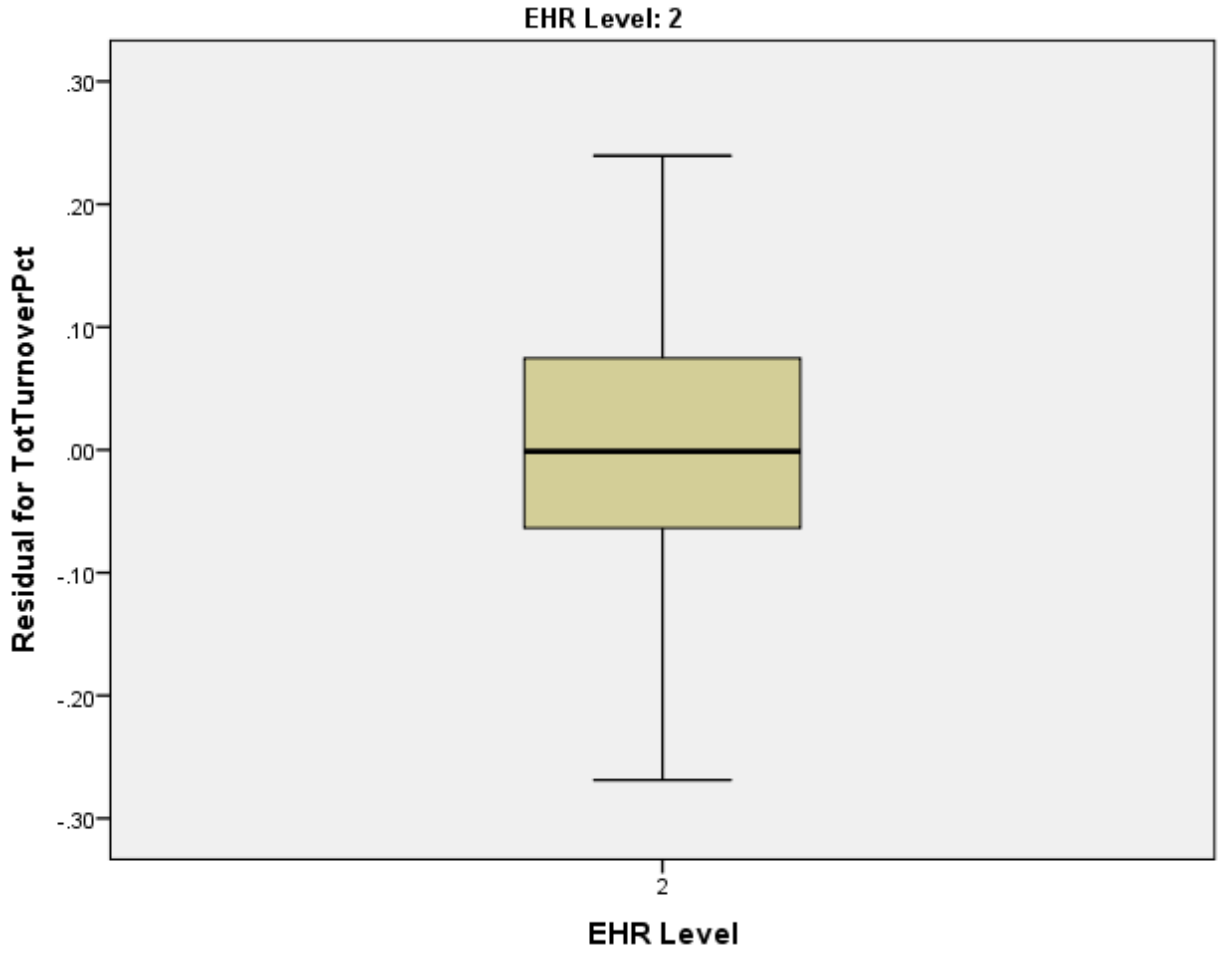

Detrended Normal Q-Q Plot of Residual for TotTurnoverPct
EHR Level= 1. for EHR= 1
Dev from Normal
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.2
0.0
0.2
0.4
Observed Value


Detrended Normal Q-Q Plot of Residual for TotTurnoverPct
EHR Level= 2. for EHR= 2
Dev from Normal
0.4
0.2
0.0000
-0.2
-0.4
-0.6
-0.3
-0.2
-0.1
0.0000
0.1
0.2
0.3
Observed Value

Boxplots

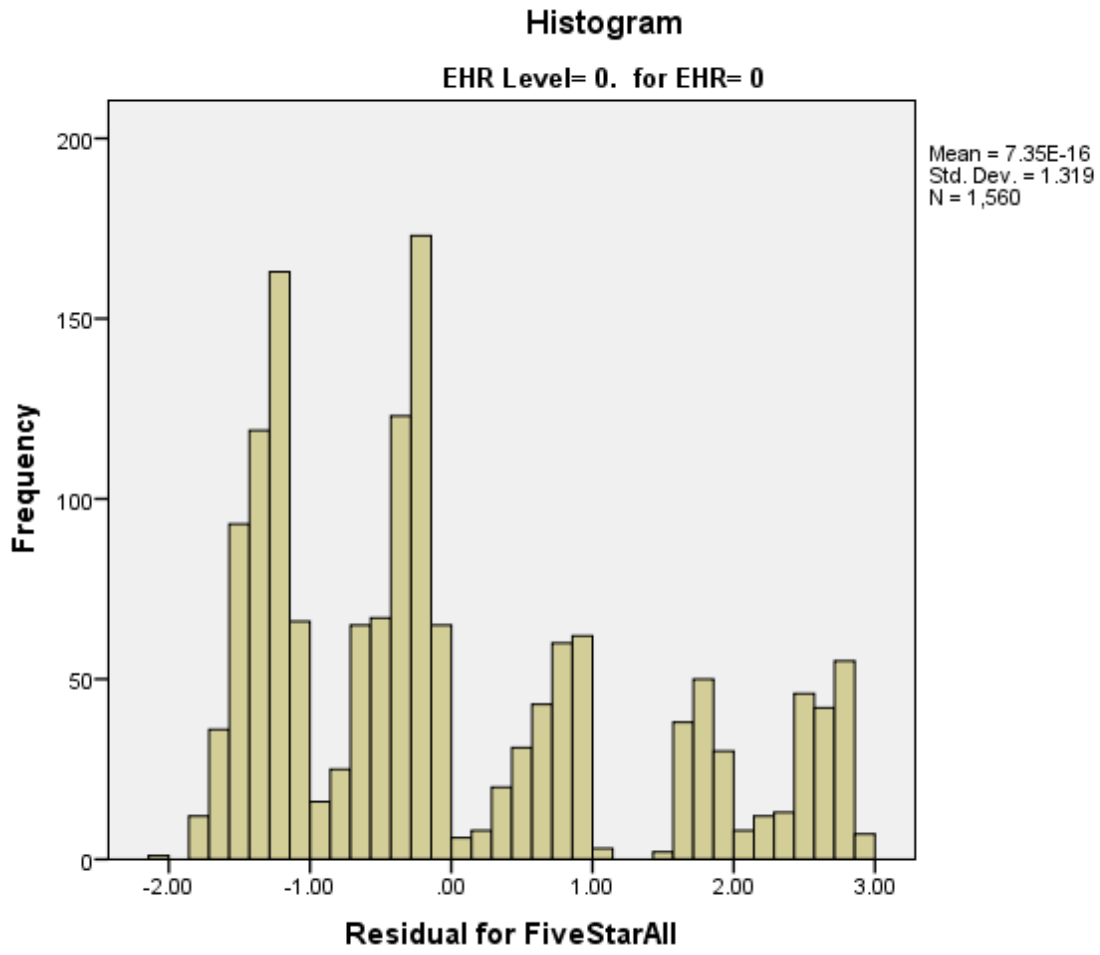

EHR Level: 0
Residual for TotTurnoverPct
.20
.00
-.20
-.40
1,357
1,432
1,441
833
719
1,132
630
805
0
EHR Level

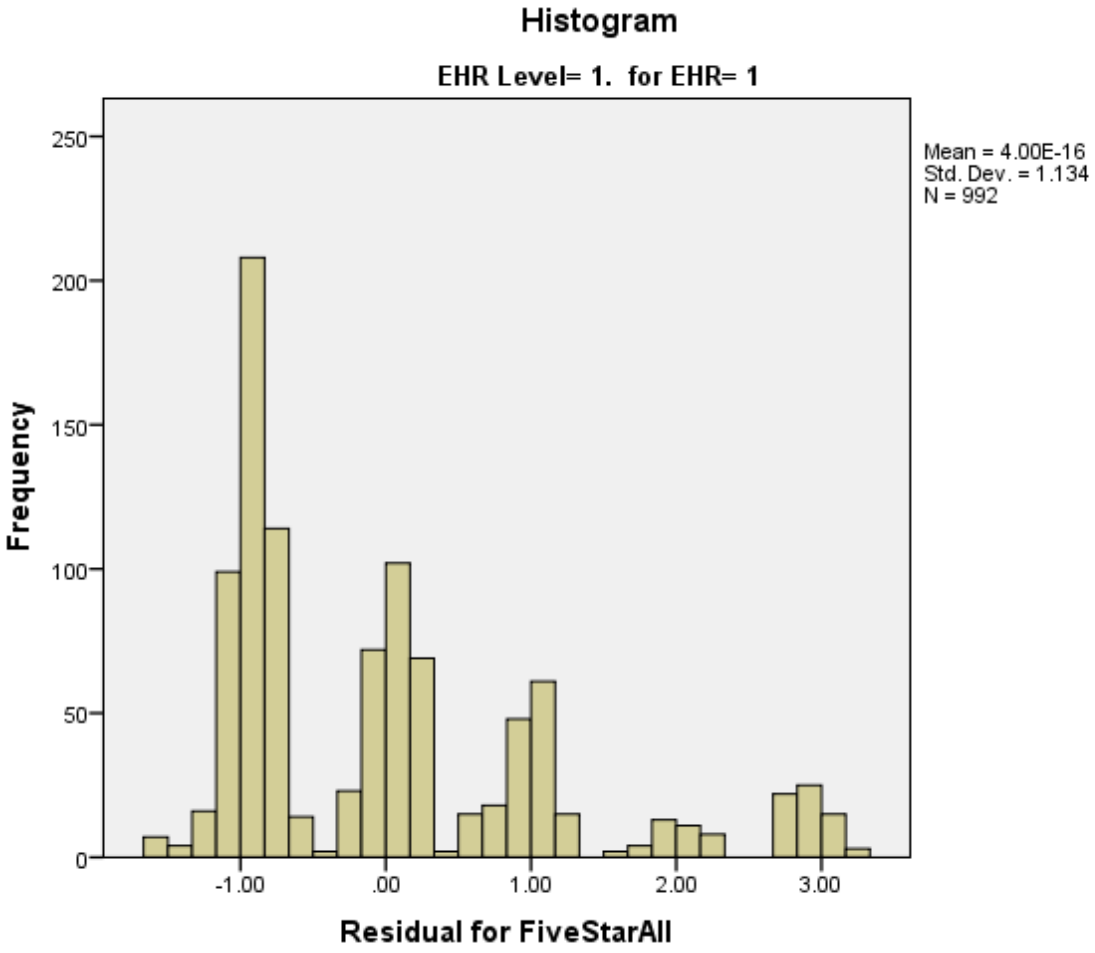

EHR Level: 1
Residual for TotTurnoverPct
.40
.20
.00
-.20
2,416
2,474
2,361
1
EHR Level

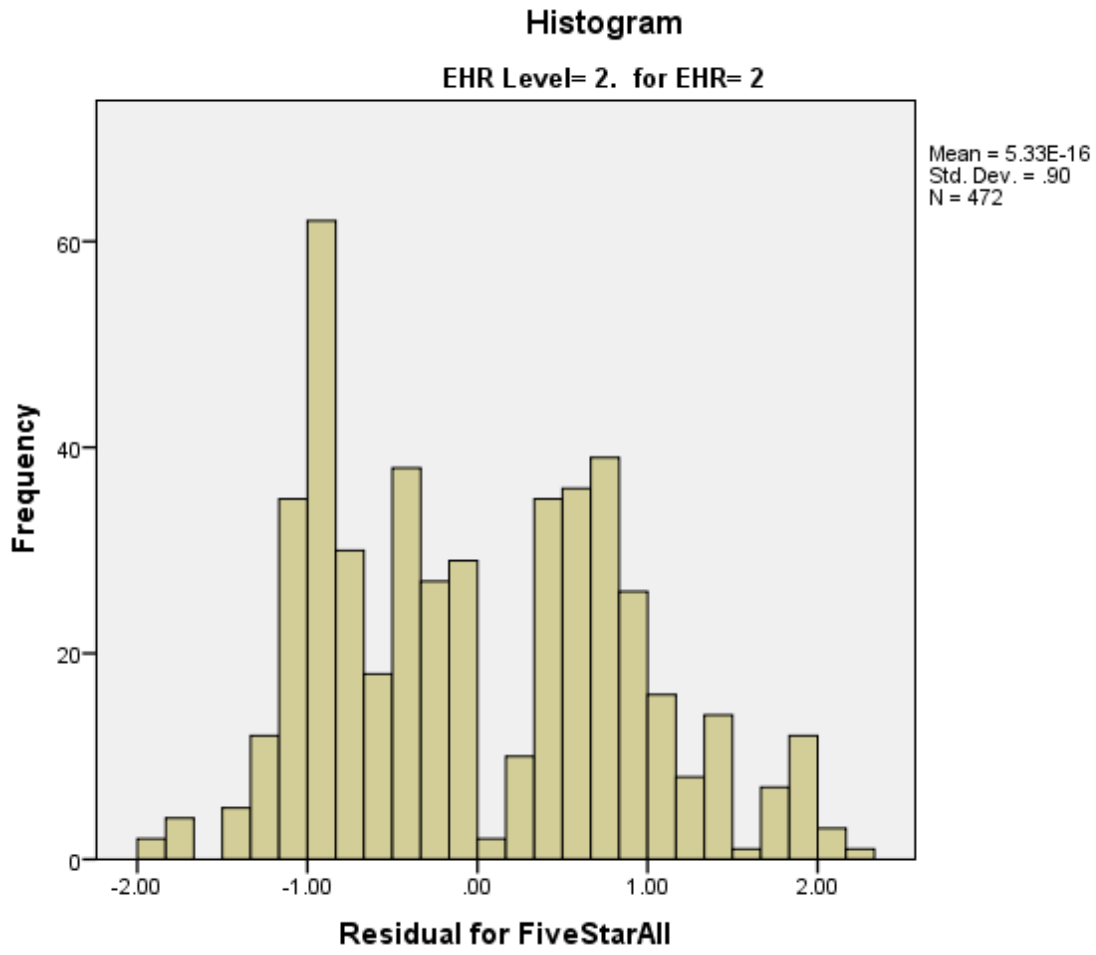


Residual for FiveStarAll

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 7.35E-16
Std. Dev. = 1.319
N = 1,560
Frequency
200
150
100
50
0
-2.00
-1.00
.00
1.00
2.00
3.00
Residual for FiveStarAll


Histogram
EHR Level= 1. for EHR= 1
Mean = 4.00E-16
Std. Dev. = 1.134
N = 992
Frequency
250
200
150
100
50
0
-1.00
.00
1.00
2.00
3.00
Residual for FiveStarAll



Stem-and-Leaf Plots

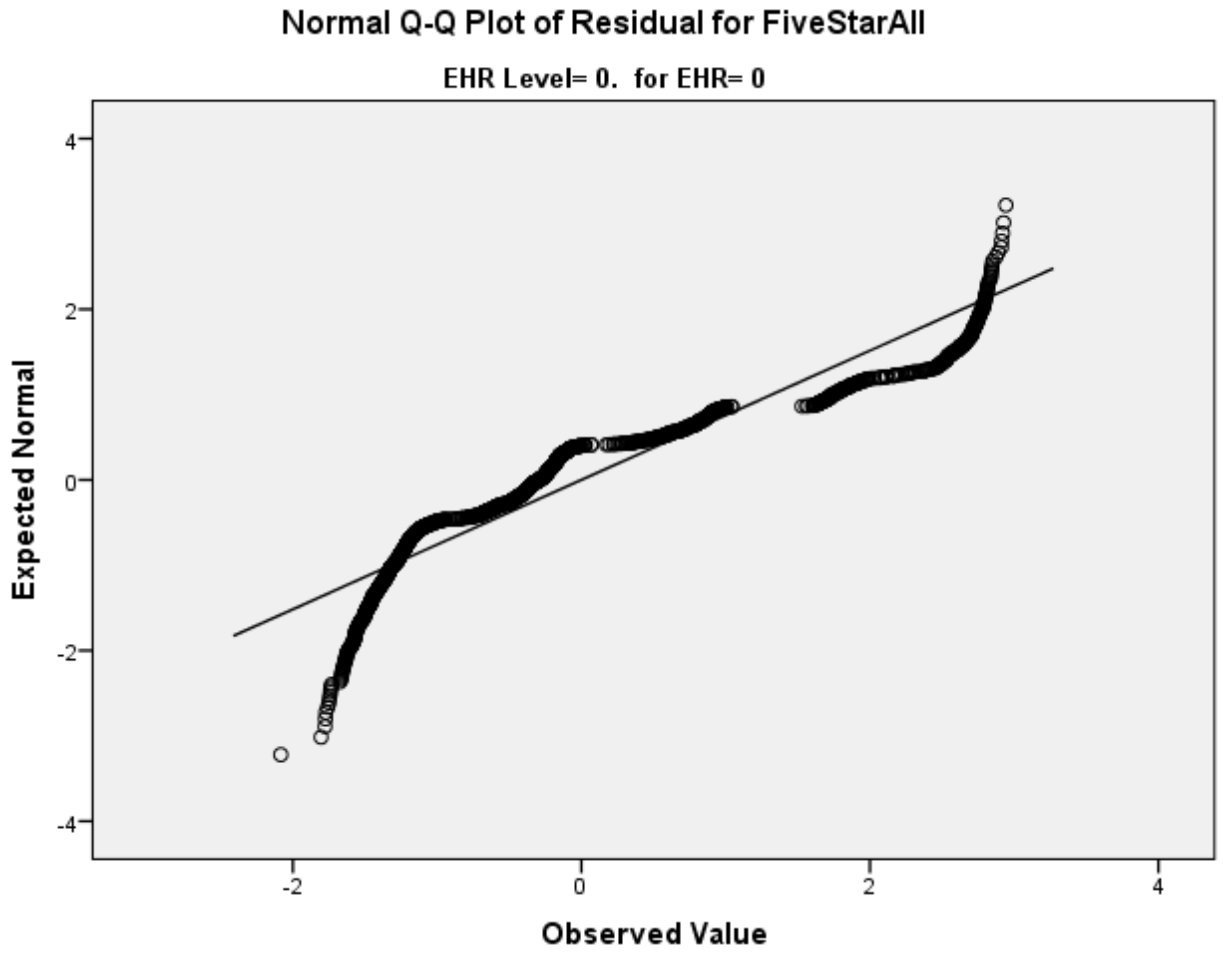
```
Residual for FiveStarAll Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     1.00       -2 .  &
     1.00       -1 .  &
    37.00       -1 .  6666666667777
   124.00       -1 .  444444444444444444444444555555555555555555
   202.00       -1 .
```

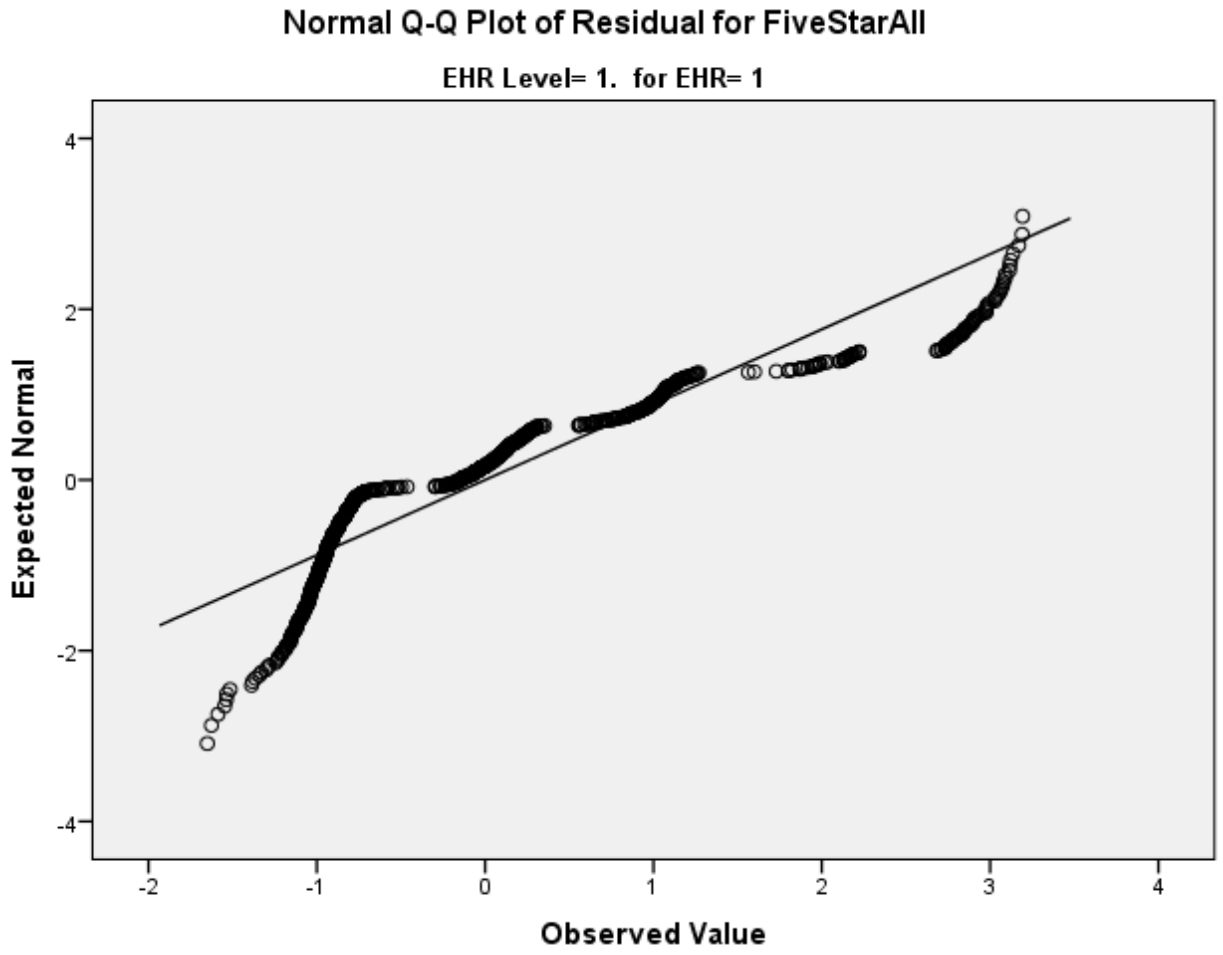
```
22222222222222222222222222222222222233333333333333333333333333333
   125.00       -1 .  00000000000011111111111111111111111111111
    23.00       -0 .  88899999
    67.00       -0 .  6666666666666667777777
   105.00       -0 .  444444444444444444444555555555555
   198.00       -0 .
22222222222222222222222222222222222233333333333333333333333333333
   141.00       -0 .  000000000000011111111111111111111111111111111
     8.00        0 .  001
    20.00        0 .  2223333
    48.00        0 .  4444445555555555
    64.00        0 .  666666667777777777777
    90.00        0 .  88888888888888888899999999999
     3.00        1 .  0
      .00        1 .
     3.00        1 .  5
    73.00        1 .  666666666677777777777777
    44.00        1 .  88888888999999
    13.00        2 .  00111
    17.00        2 .  222333
    53.00        2 .  444444455555555555
    75.00        2 .  666666666677777777777777
    25.00        2 .  888888899

 Stem width:      1.00
 Each leaf:        3 case(s)



 & denotes fractional leaves.



Residual for FiveStarAll Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     7.00       -1 .  5&
   119.00       -1 .  00000000000000000001111111223
   336.00       -0 .
5566677777777777777778888888888888888888888888899999999999999999999
999999999999
    97.00       -0 .  000000000001111111222&
   173.00        0 .  000000000000000111111111111122222222222233
    81.00        0 .  56667778888899999999
    76.00        1 .  000000000001111122
    19.00        1 .  8899&
    19.00        2 .  1112&
    45.00        2 .  77778888999&
    20.00 Extremes    (>=3.0)

 Stem width:      1.00
 Each leaf:        4 case(s)
```

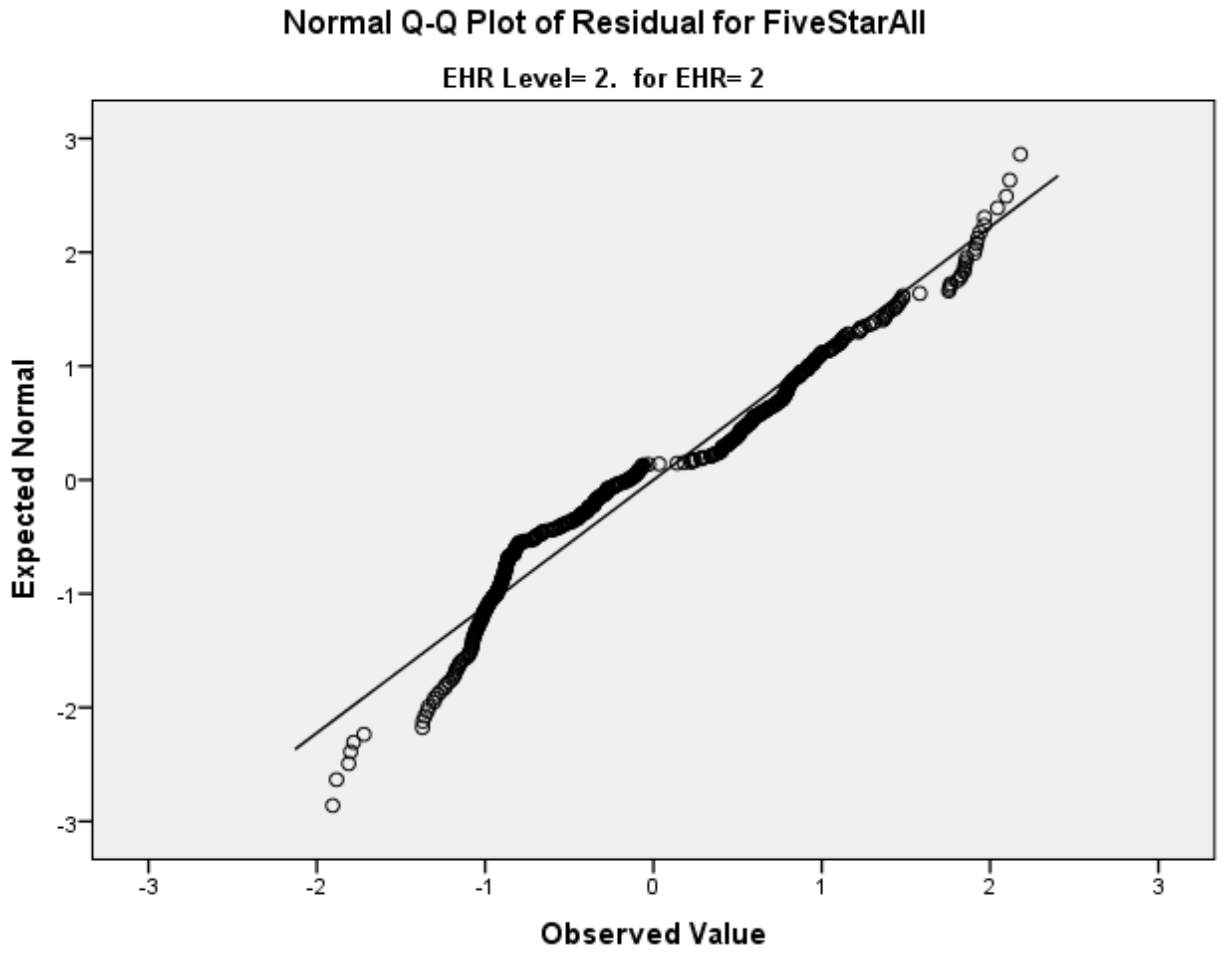
```
 & denotes fractional leaves.
```

```
Residual for FiveStarAll Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     6.00       -1 .  78&
    52.00       -1 .  00000000000000001111122333
   110.00       -0 .
555555666667777888888888888888888888999999999999999
    94.00       -0 .  00000000111111112222222233333333333333444444444
    47.00        0 .  1222233333444444444444&
   101.00        0 .  55555555555555666666777777777777888888899999999
    38.00        1 .  0000111122233334444
    20.00        1 .  778888999&
     4.00        2 .  01

 Stem width:      1.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

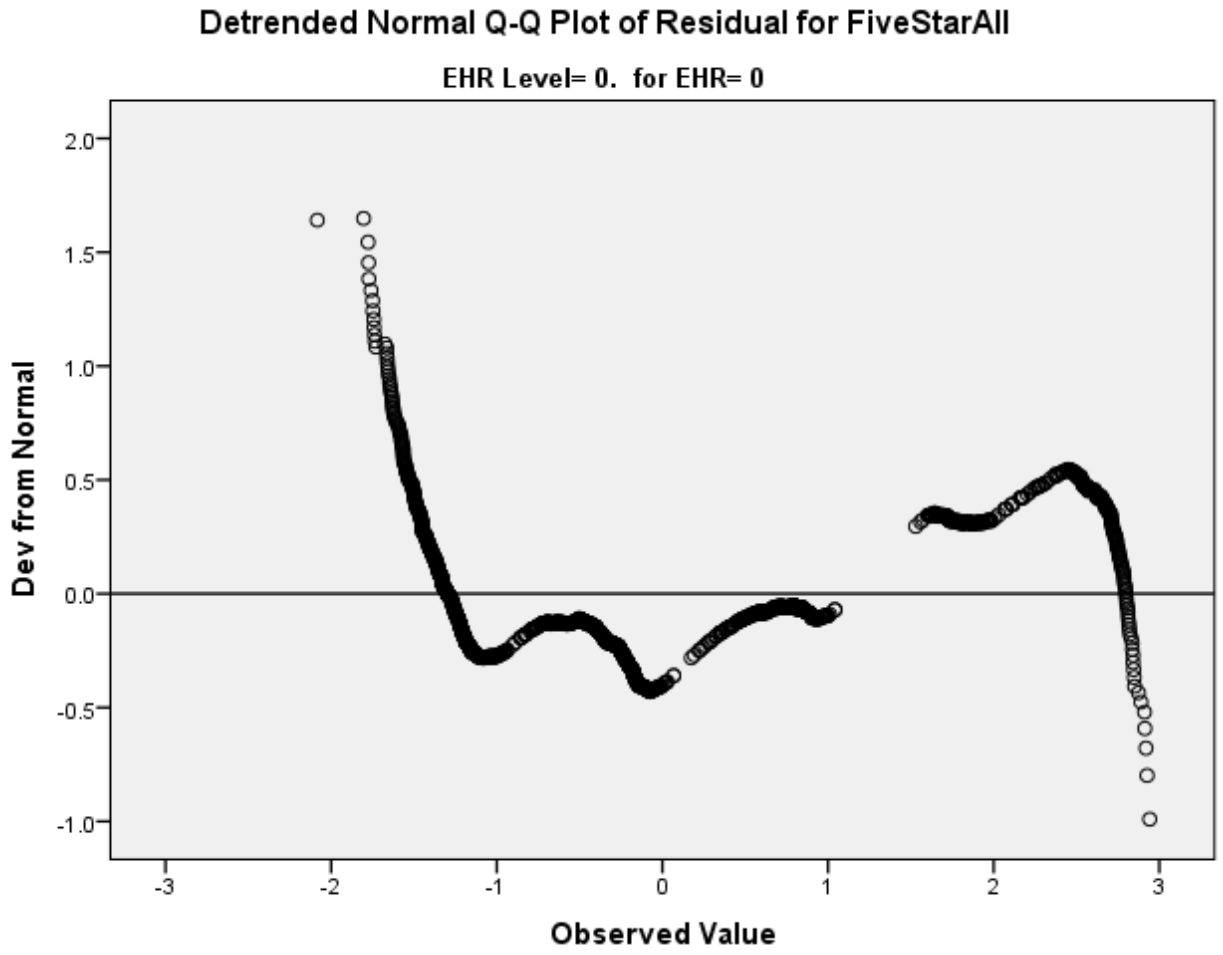
Normal Q-Q Plots

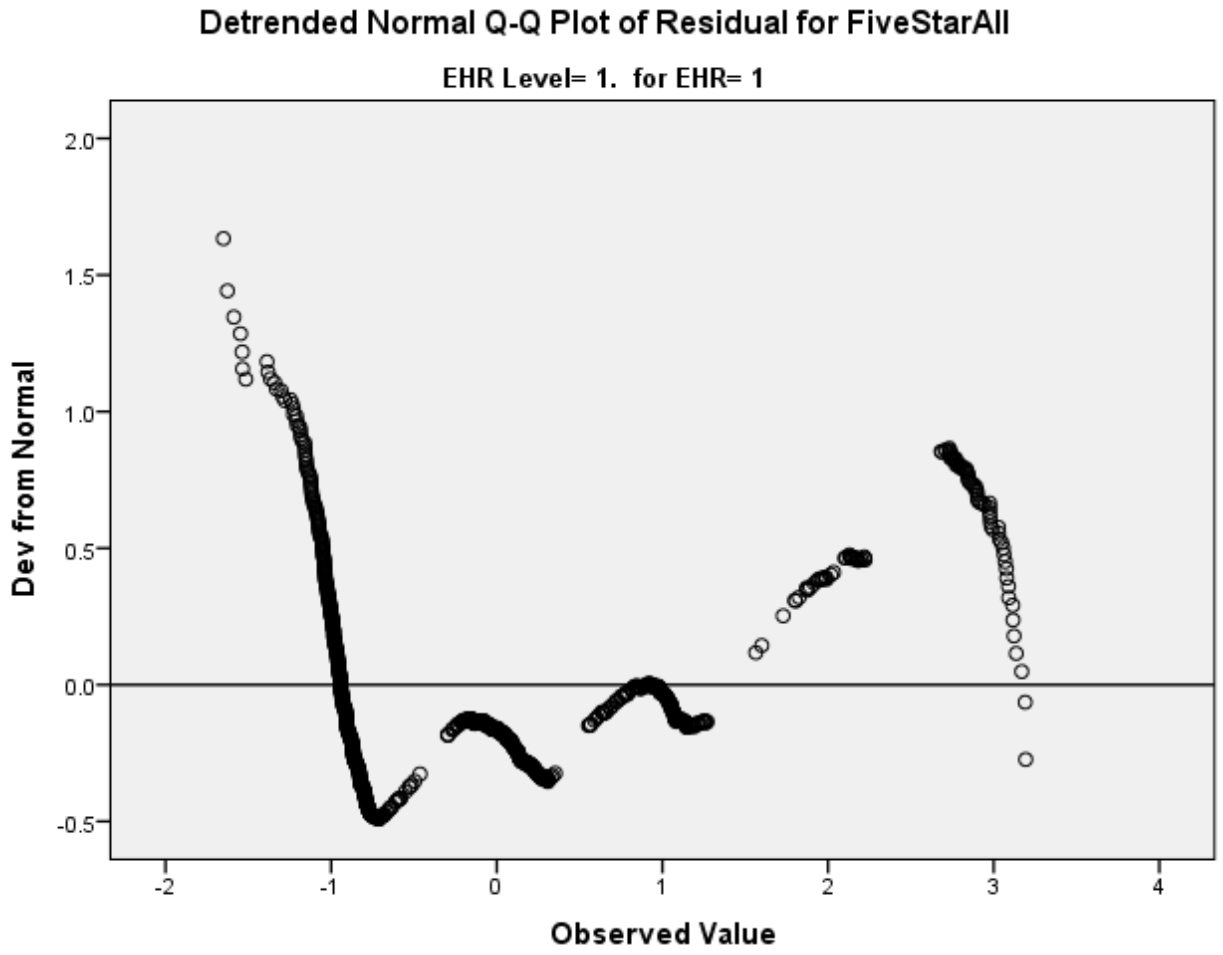

Normal Q-Q Plot of Residual for FiveStarAll
EHR Level= 0. for EHR= 0
Expected Normal
Observed Value
4
2
0
-2
-4
-2
0
2
4

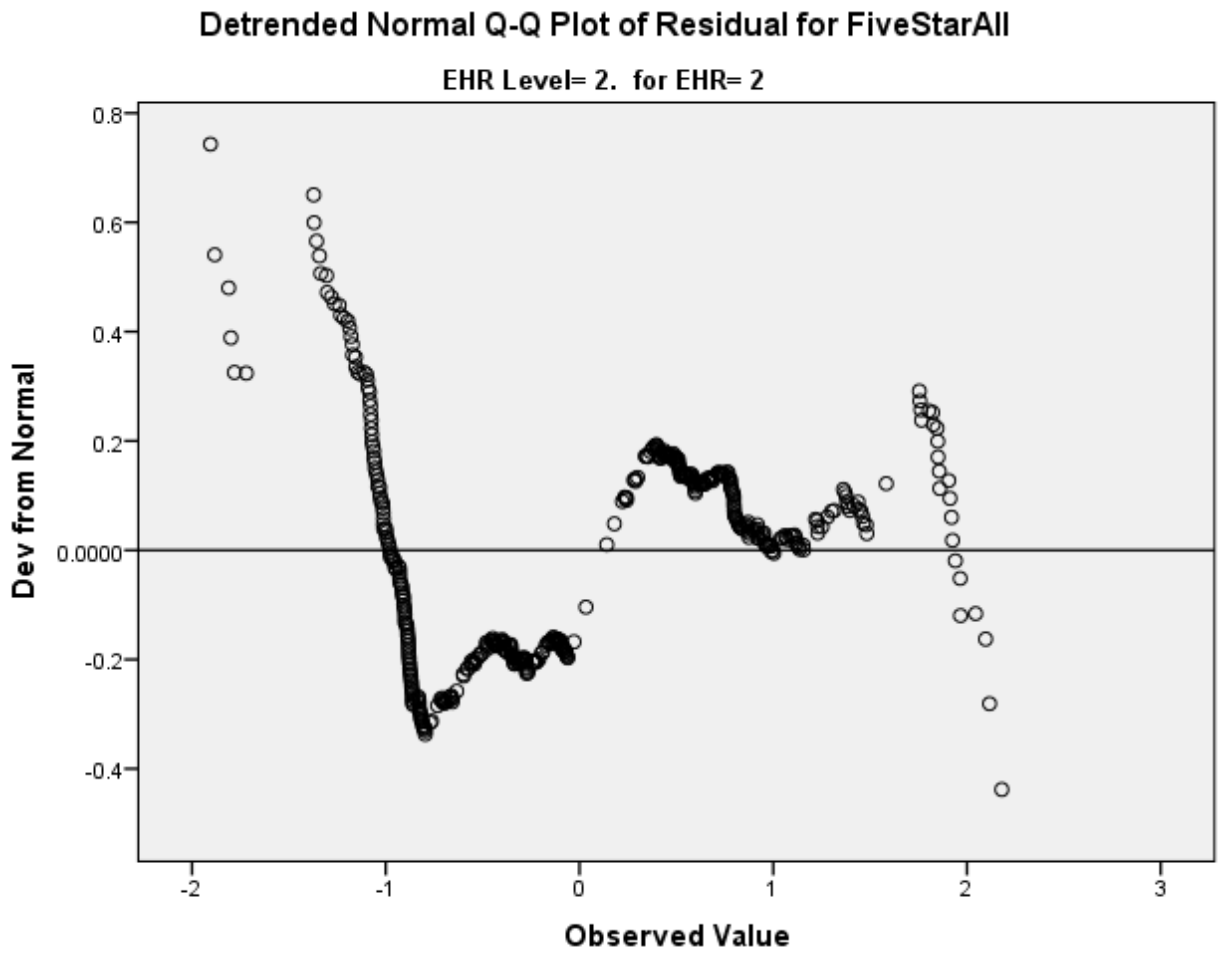

Normal Q-Q Plot of Residual for FiveStarAll
EHR Level= 1. for EHR= 1
Expected Normal
Observed Value
4
2
0
-2
-4
-2
-1
0
1
2
3
4



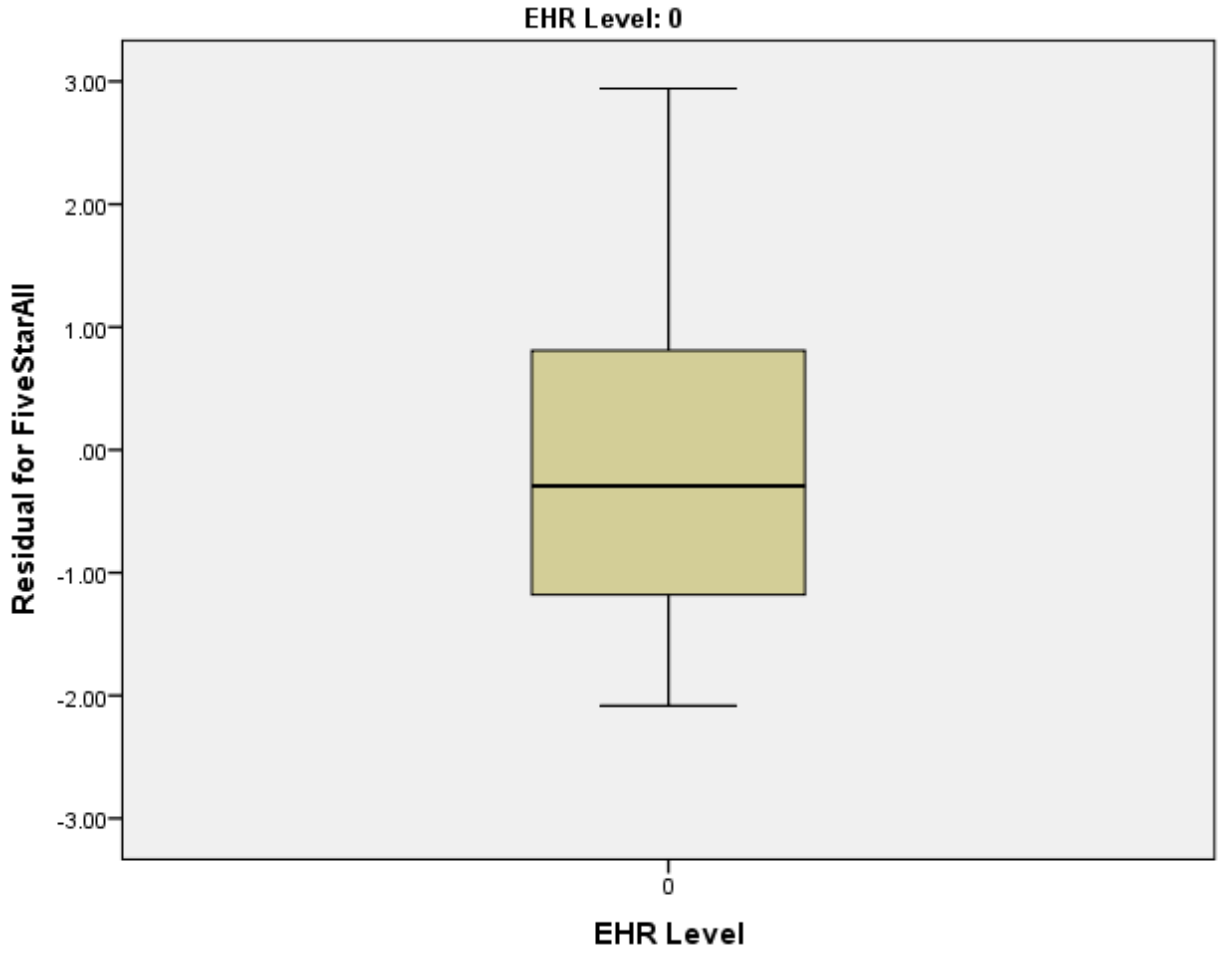
Detrended Normal Q-Q Plots

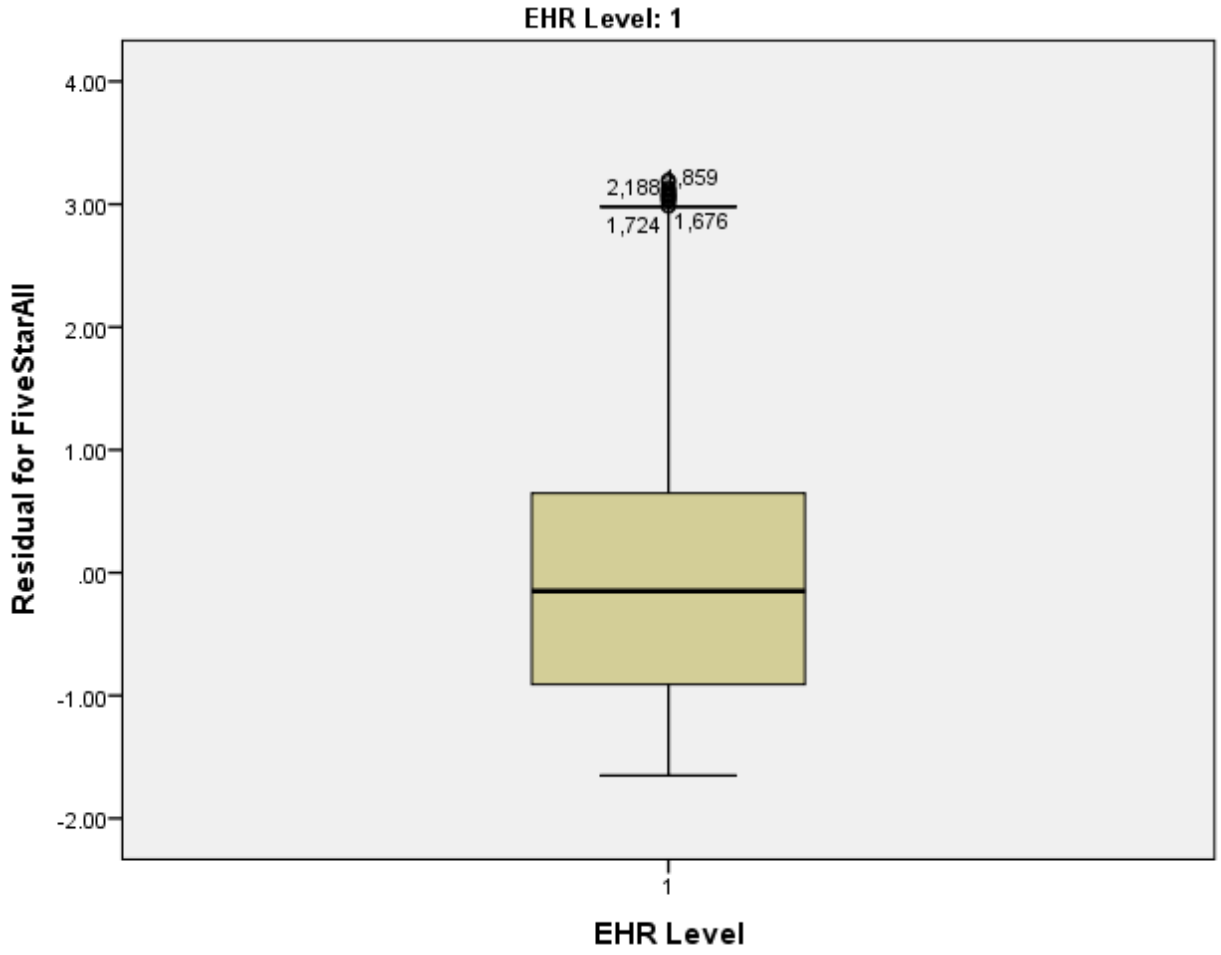

Detrended Normal Q-Q Plot of Residual for FiveStarAll
EHR Level= 0. for EHR= 0
Dev from Normal
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-3
-2
-1
0
1
2
3
Observed Value

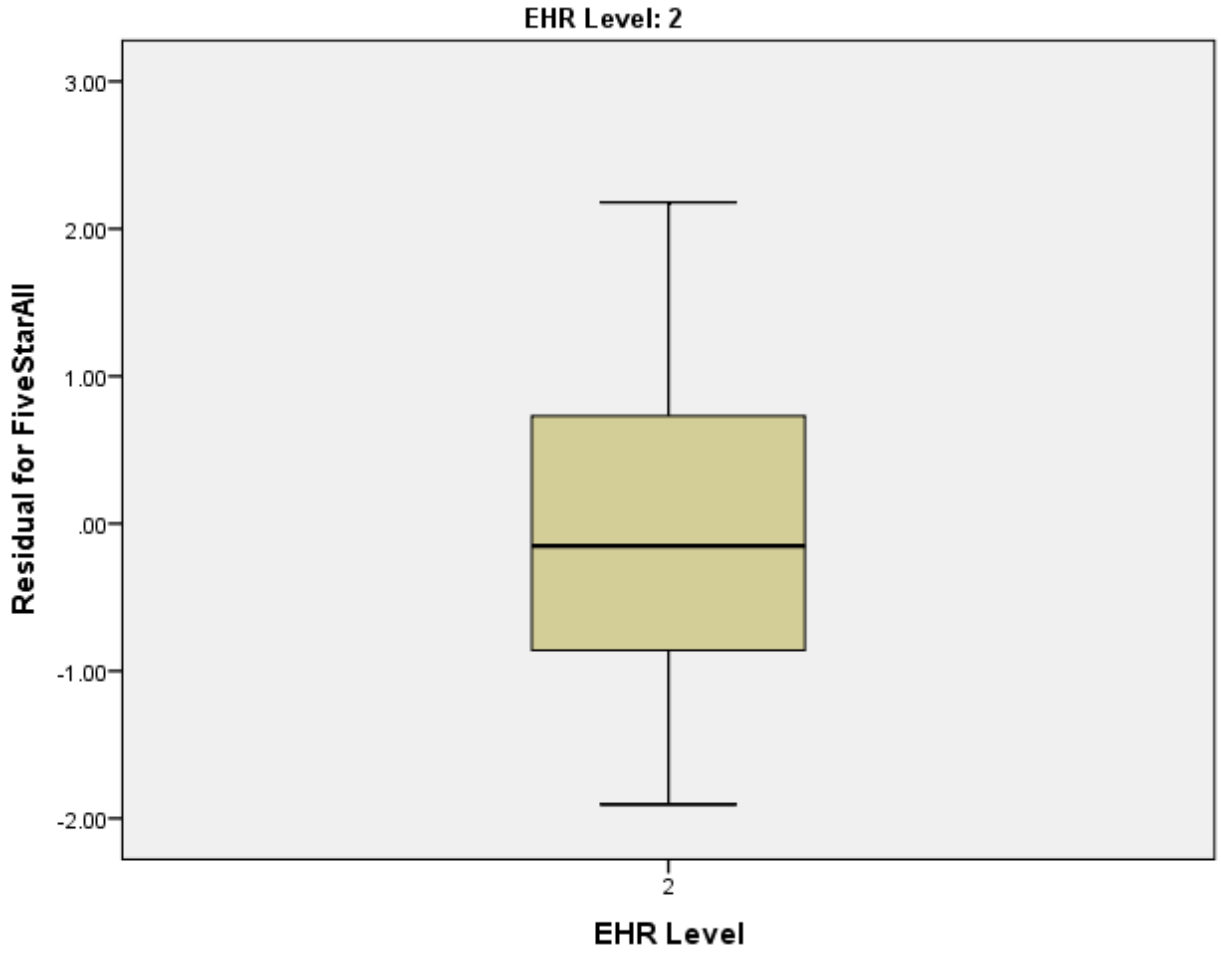

Detrended Normal Q-Q Plot of Residual for FiveStarAll
EHR Level= 1. for EHR= 1
Dev from Normal
2.0
1.5
1.0
0.5
0.0
-0.5
-2
-1
0
1
2
3
4
Observed Value


Detrended Normal Q-Q Plot of Residual for FiveStarAll
EHR Level= 2. for EHR= 2
Dev from Normal
0.8
0.6
0.4
0.2
0.0000
-0.2
-0.4
-2
-1
0
1
2
3
Observed Value

Boxplots

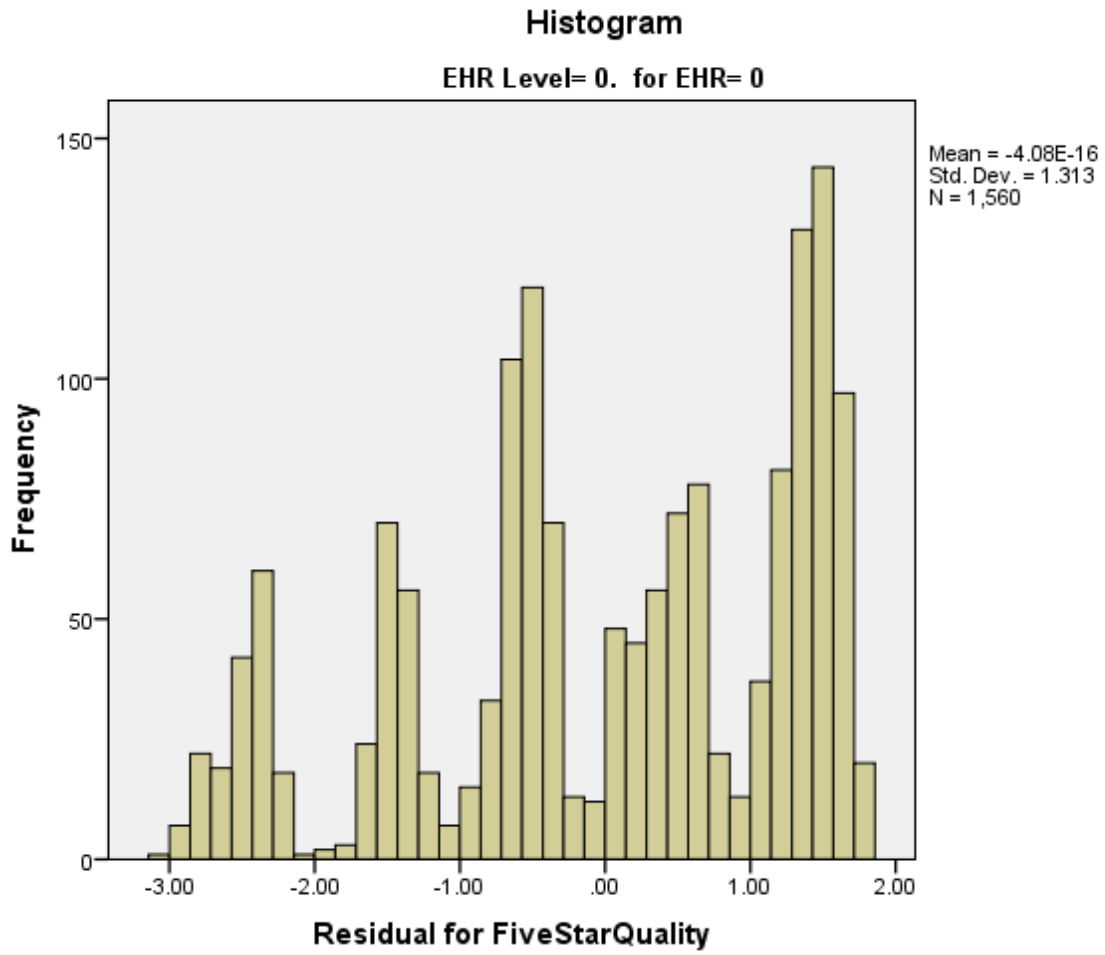

EHR Level: 0
3.00
2.00
1.00
.00
-1.00
-2.00
-3.00
Residual for FiveStarAll
0
EHR Level

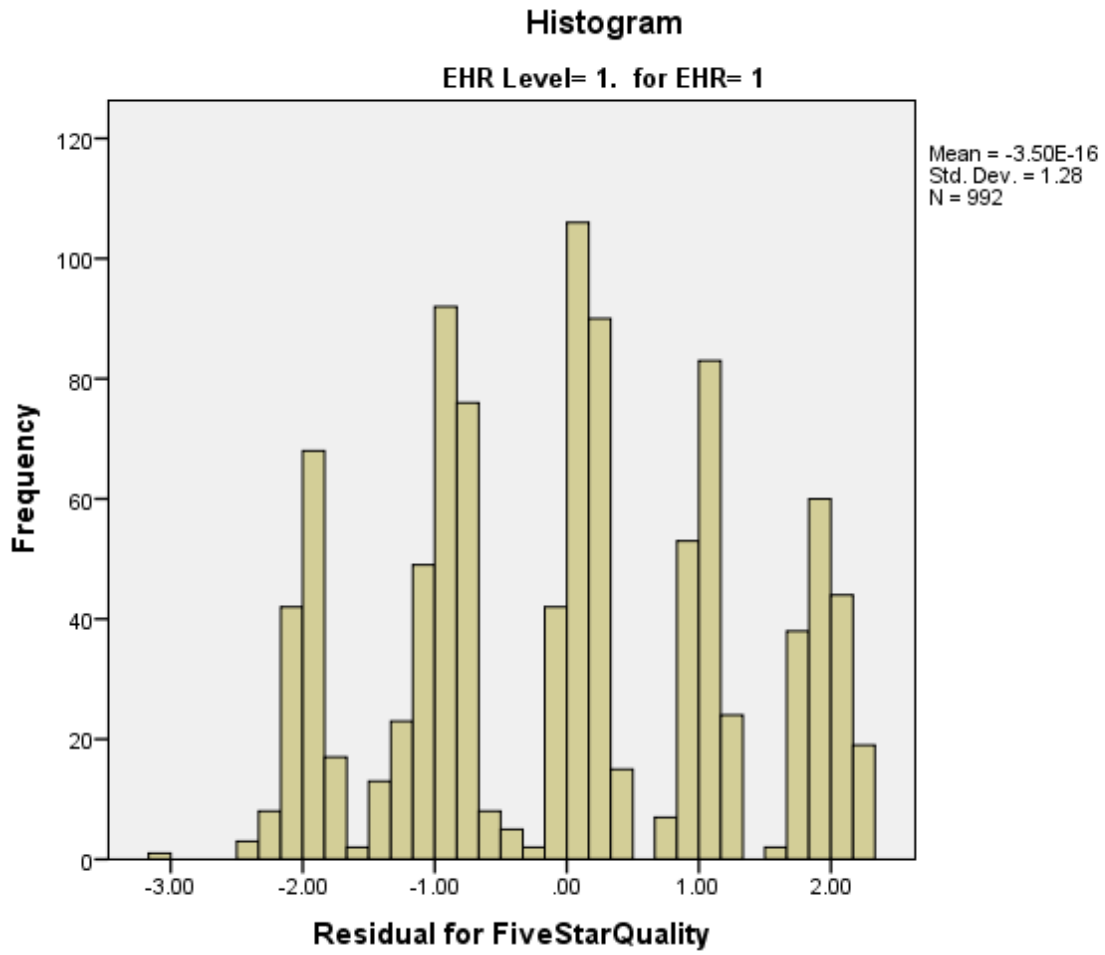

EHR Level: 1
Residual for FiveStarAll
4.00
3.00
2.00
1.00
.00
-1.00
-2.00
2,188
,859
1,724
1,676
1
EHR Level

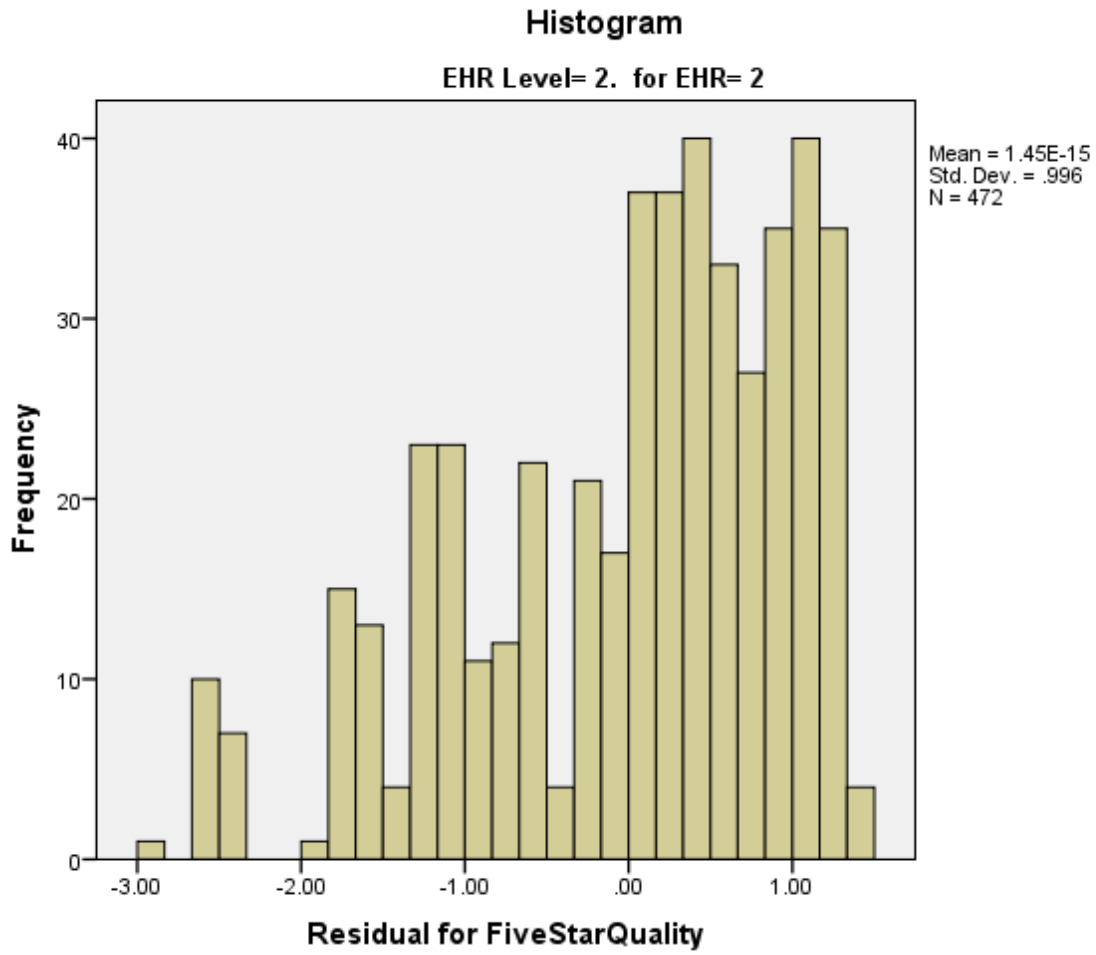


Residual for FiveStarQuality

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = -4.08E-16
Std. Dev. = 1.313
N = 1,560
Frequency
150
100
50
0
-3.00
-2.00
-1.00
.00
1.00
2.00
Residual for FiveStarQuality


Histogram
EHR Level= 1. for EHR= 1
Mean = -3.50E-16
Std. Dev. = 1.28
N = 992
Frequency
120
100
80
60
40
20
0
-3.00
-2.00
-1.00
.00
1.00
2.00
Residual for FiveStarQuality



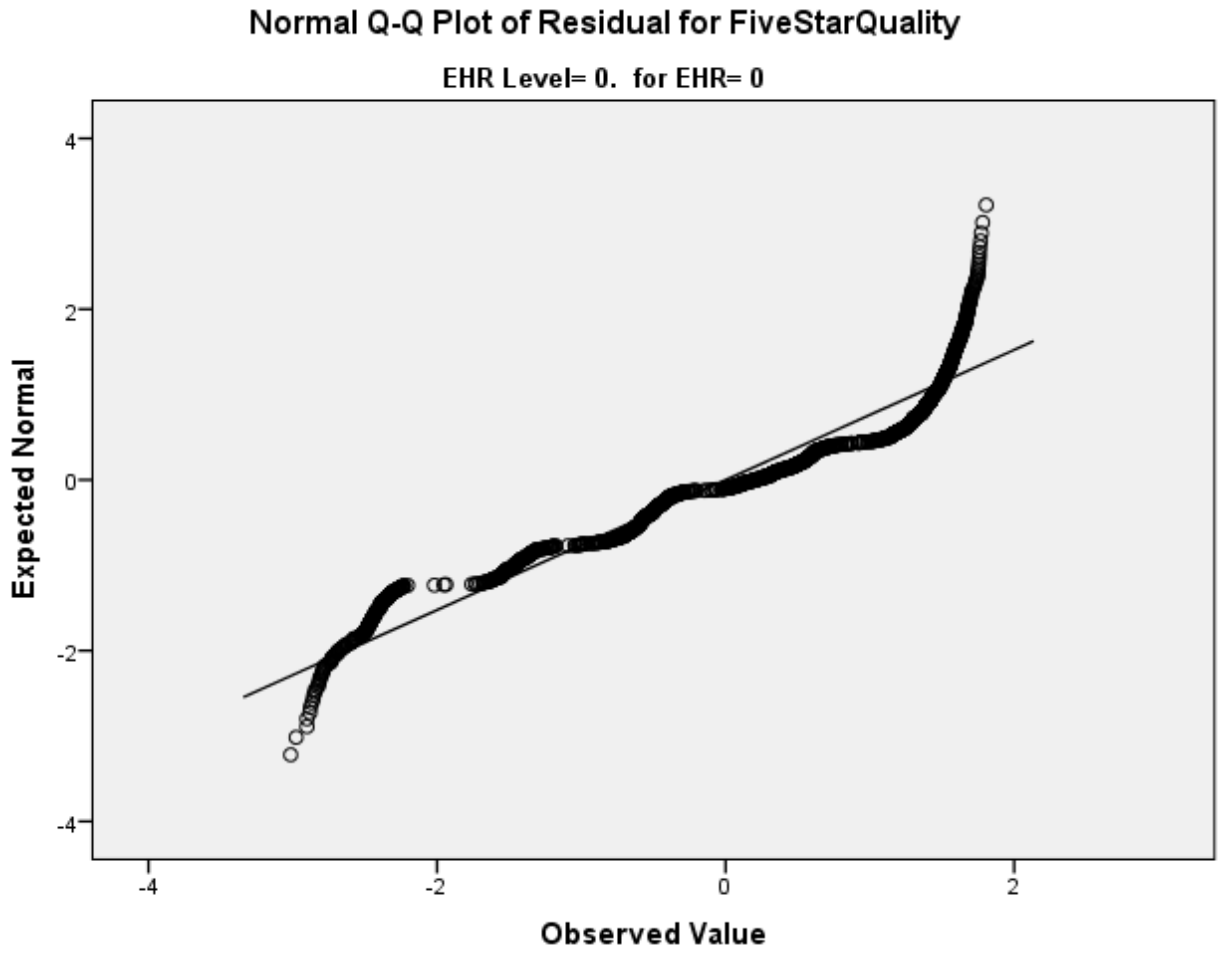
Stem-and-Leaf Plots

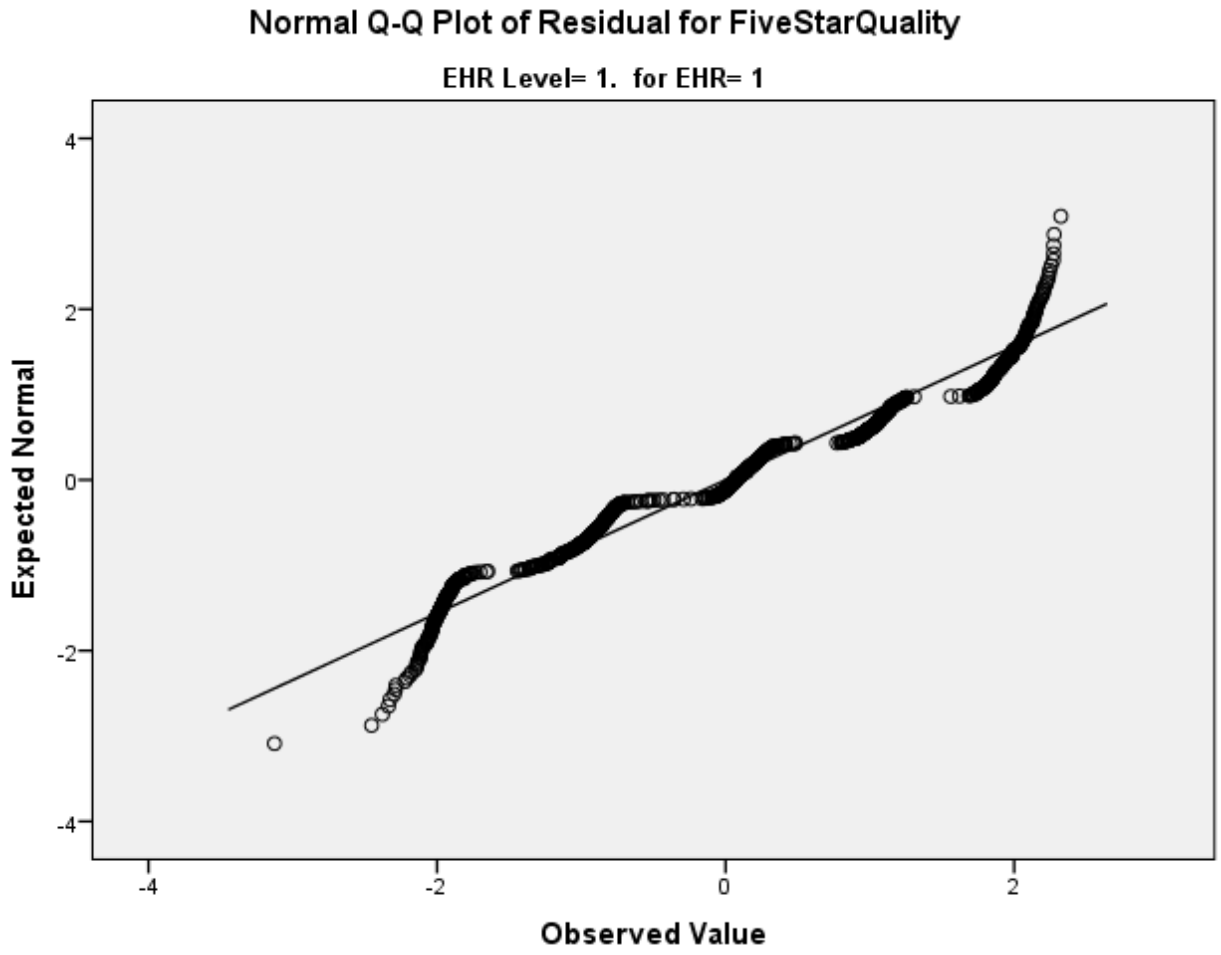
```
Residual for FiveStarQuality Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     1.00       -3 .  &
    16.00       -2 .  8888889
    26.00       -2 .  666667777777
    59.00       -2 .  44444444444444444444455555555
    67.00       -2 .  22222222223333333333333333333333
```

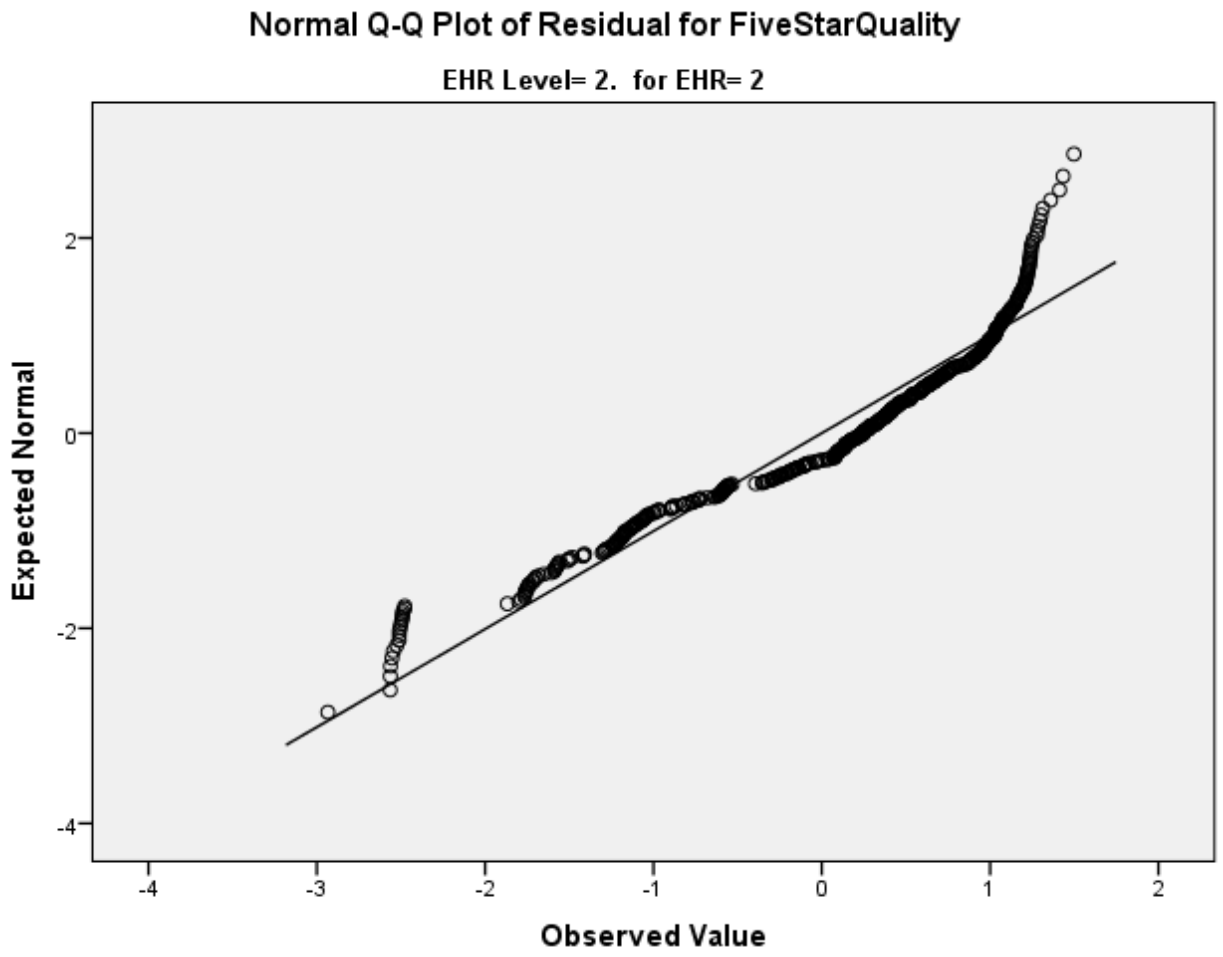
```
     1.00       -2 .  &
     2.00       -1 .  9
    21.00       -1 .  6666666677
    85.00       -1 .  444444444444444444444455555555555555555555
    60.00       -1 .  22222223333333333333333333333
    12.00       -1 .  00011
    25.00       -0 .  888888889999
    94.00       -0 .  66666666666666666666666666666666677777777777777
   178.00       -0 .
44444444444444444444444444444444444444444455555555555555555555555555
555555555555555555
    56.00       -0 .  22222223333333333333333333333
    13.00       -0 .  000001
    63.00        0 .  00000000000001111111111111111
    77.00        0 .  22222222222222233333333333333333333333
   106.00        0 .
44444444444444444445555555555555555555555555555555
    68.00        0 .  66666666666666666666666677777777
    20.00        0 .  8888899999
    68.00        1 .  00000000001111111111111111111111
   153.00        1 .
22222222222222222222222222222222233333333333333333333333333333333333
33333
   197.00        1 .
44444444444444444444444444444444444444444444455555555555555555555555555
555555555555555555555555555
    91.00        1 .  66666666666666666666666666666666777777777777
     1.00        1 .  &

 Stem width:      1.00
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for FiveStarQuality Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     1.00       -3 .  &
      .00       -2 .
    53.00       -2 .  000000000011111223&
    87.00       -1 .  67778888888888999999999999999
    85.00       -1 .  00000000001111111222222233334
   176.00       -0 .
55667777777777777777888888888888888888888999999999999999999
    49.00       -0 .  00000000000011234
   211.00        0 .
00000000000000000000001111111111111111111222222222222222222233333333444
    60.00        0 .  788888899999999999999
```

```
  107.00        1 .  00000000000000001111111111111122222&
  100.00        1 .  67777777788888888888889999999999&
   63.00        2 .  000000000111111112222&

 Stem width:      1.00
 Each leaf:        3 case(s)


 & denotes fractional leaves.



Residual for FiveStarQuality Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

    11.00       -2 .  55555&
     7.00       -2 .  444
    29.00       -1 .  5555566777777&
    50.00       -1 .  00000001111111122222244&
    45.00       -0 .  555555556667777888899
    42.00       -0 .  000011111112222222333
   114.00        0 .
000000001111111111112222222222223333333333344444444444
    95.00        0 .  55555555556666666667777777788888899999999999999
    79.00        1 .  00000000000001111111111222222222222234

 Stem width:      1.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

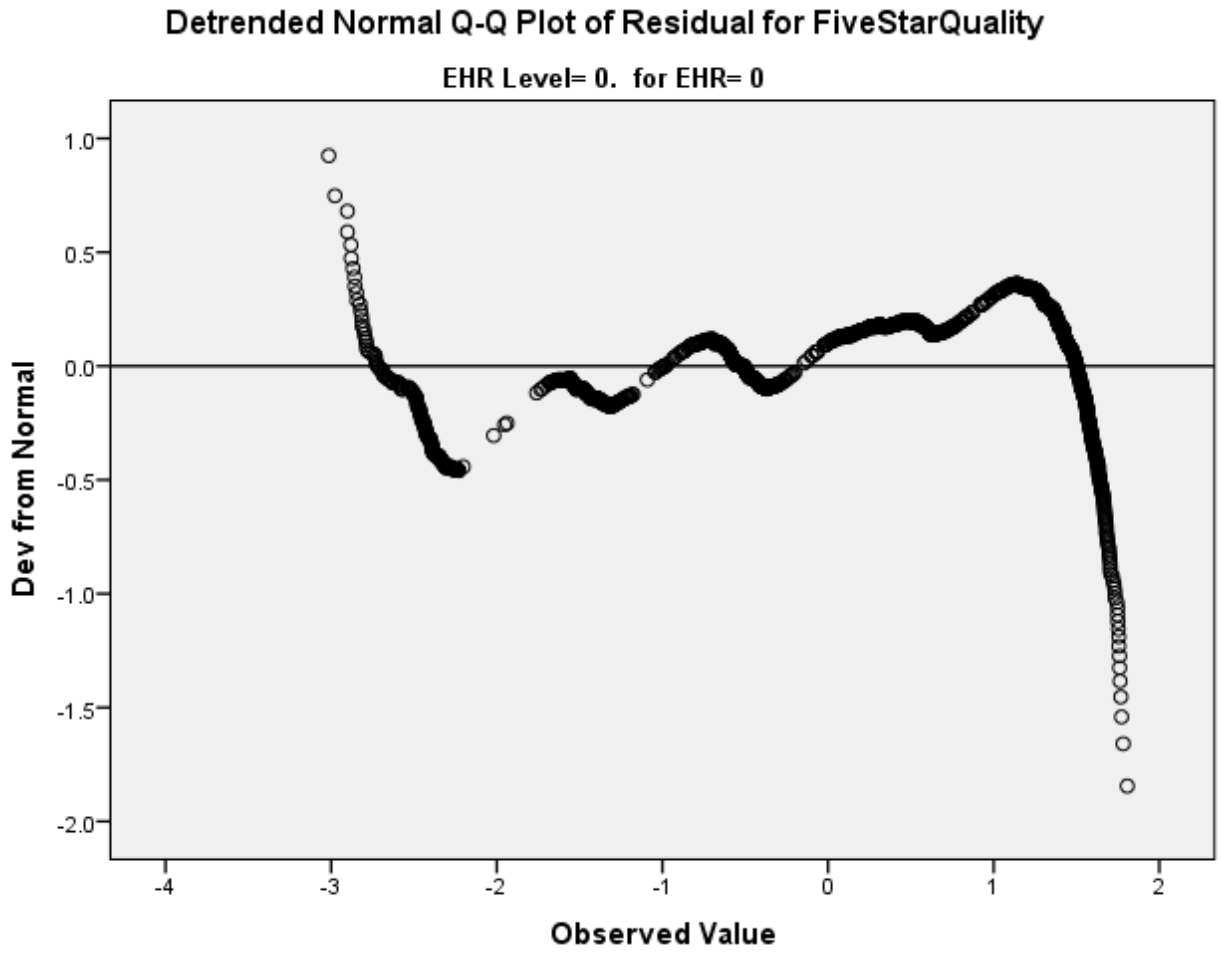
Normal Q-Q Plots

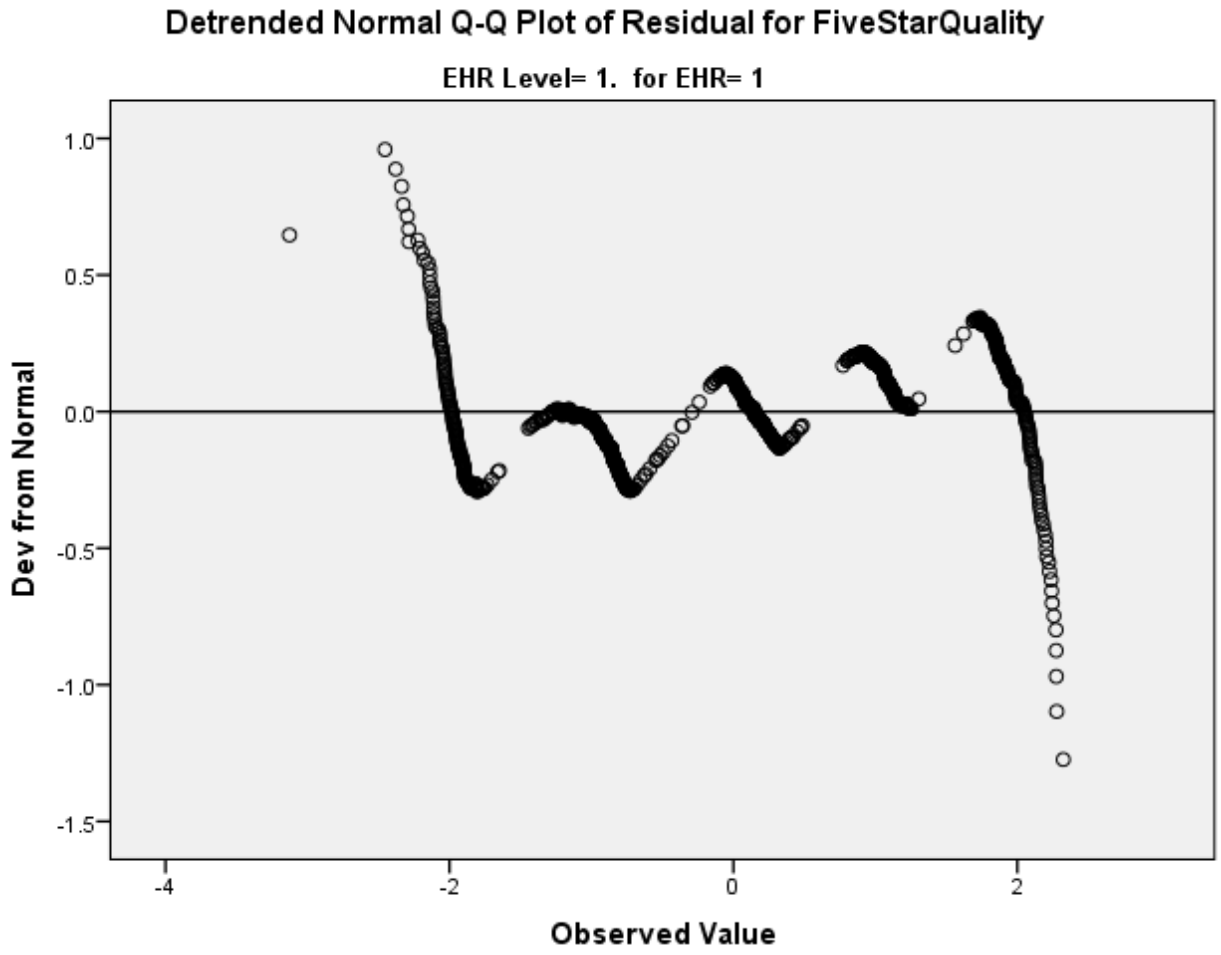

Normal Q-Q Plot of Residual for FiveStarQuality
EHR Level= 0. for EHR= 0
Expected Normal
Observed Value
4
2
0
-2
-4
-4
-2
0
2

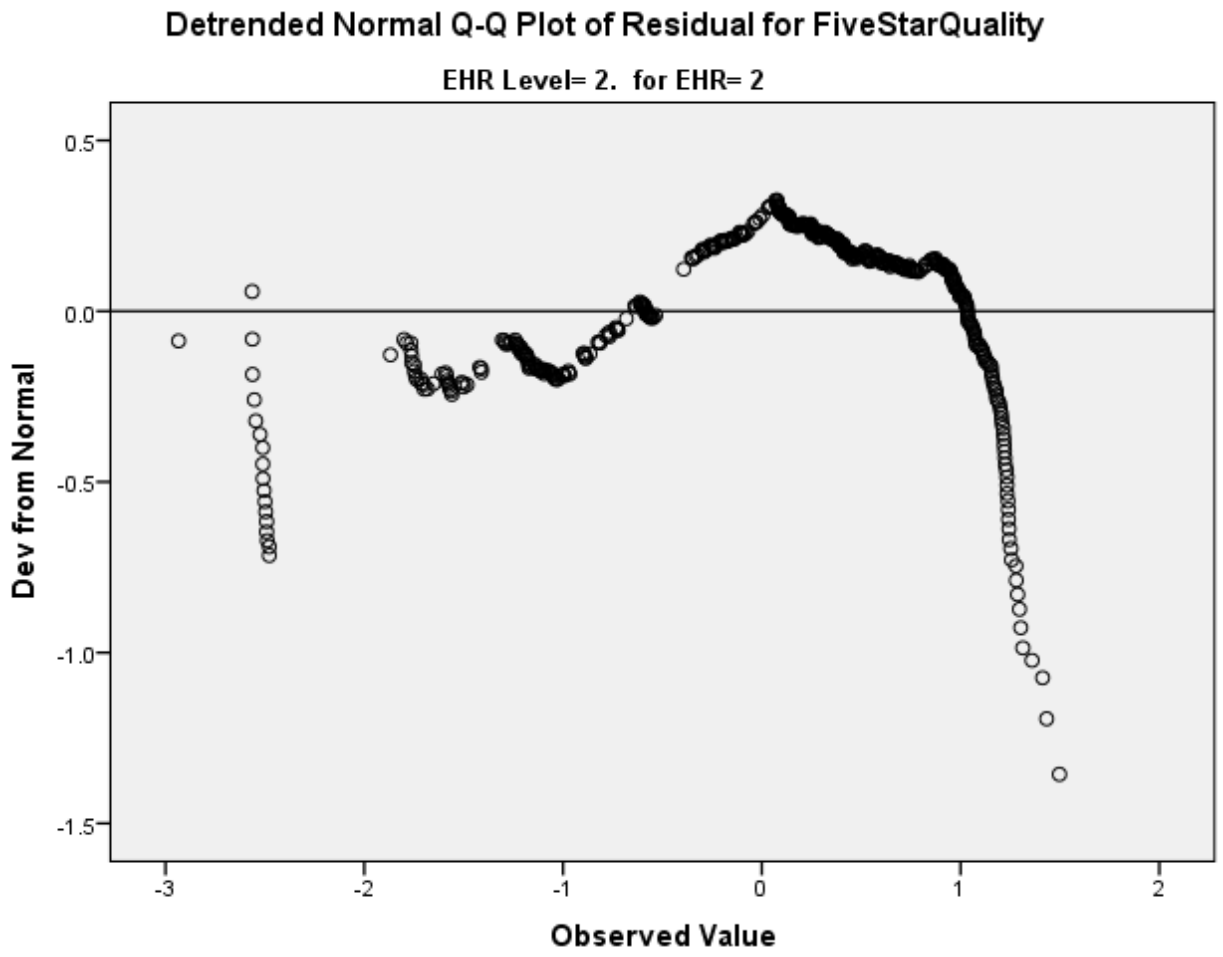

Normal Q-Q Plot of Residual for FiveStarQuality
EHR Level= 1. for EHR= 1
Expected Normal
Observed Value
4
2
0
-2
-4
-4
-2
0
2



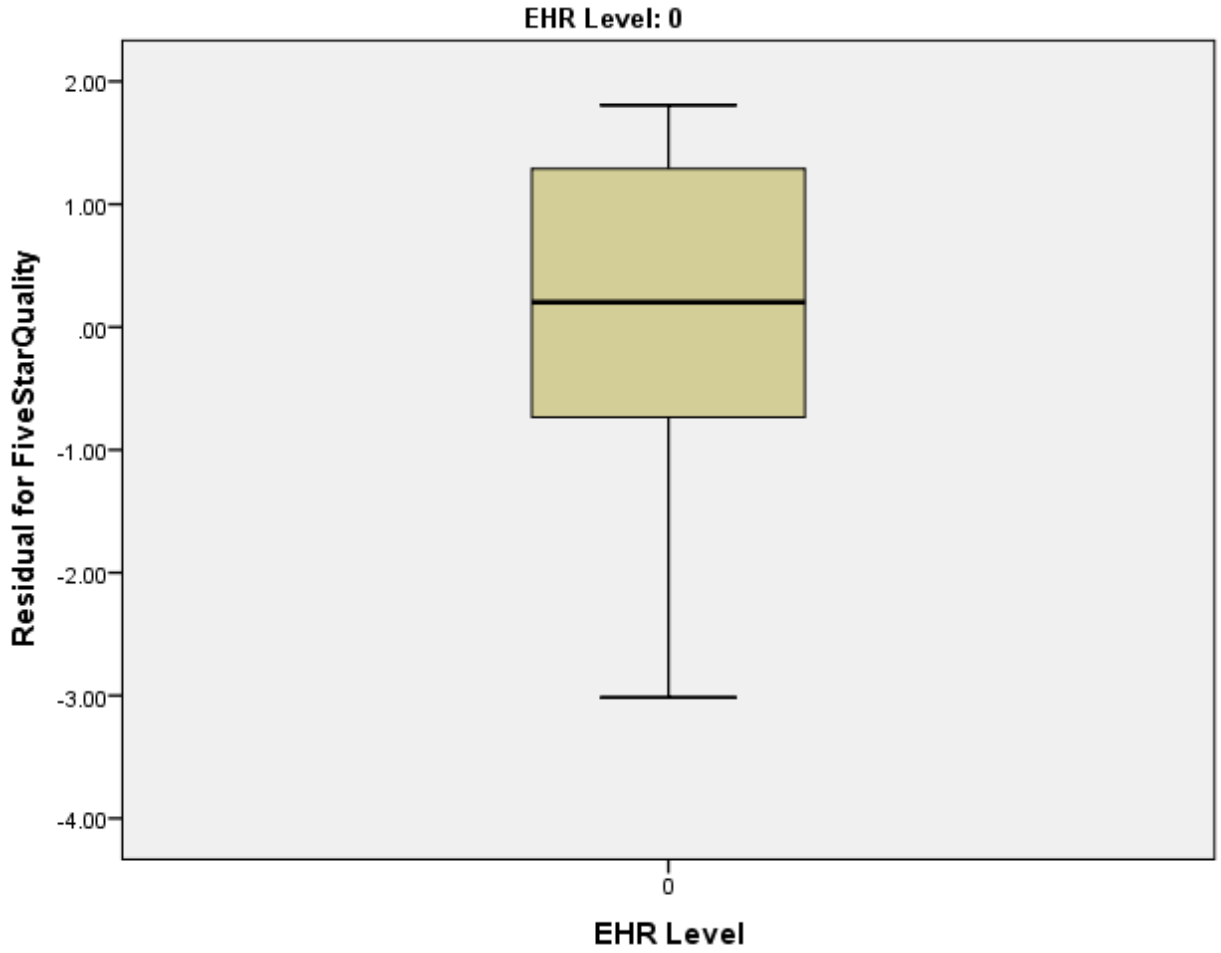
Detrended Normal Q-Q Plots

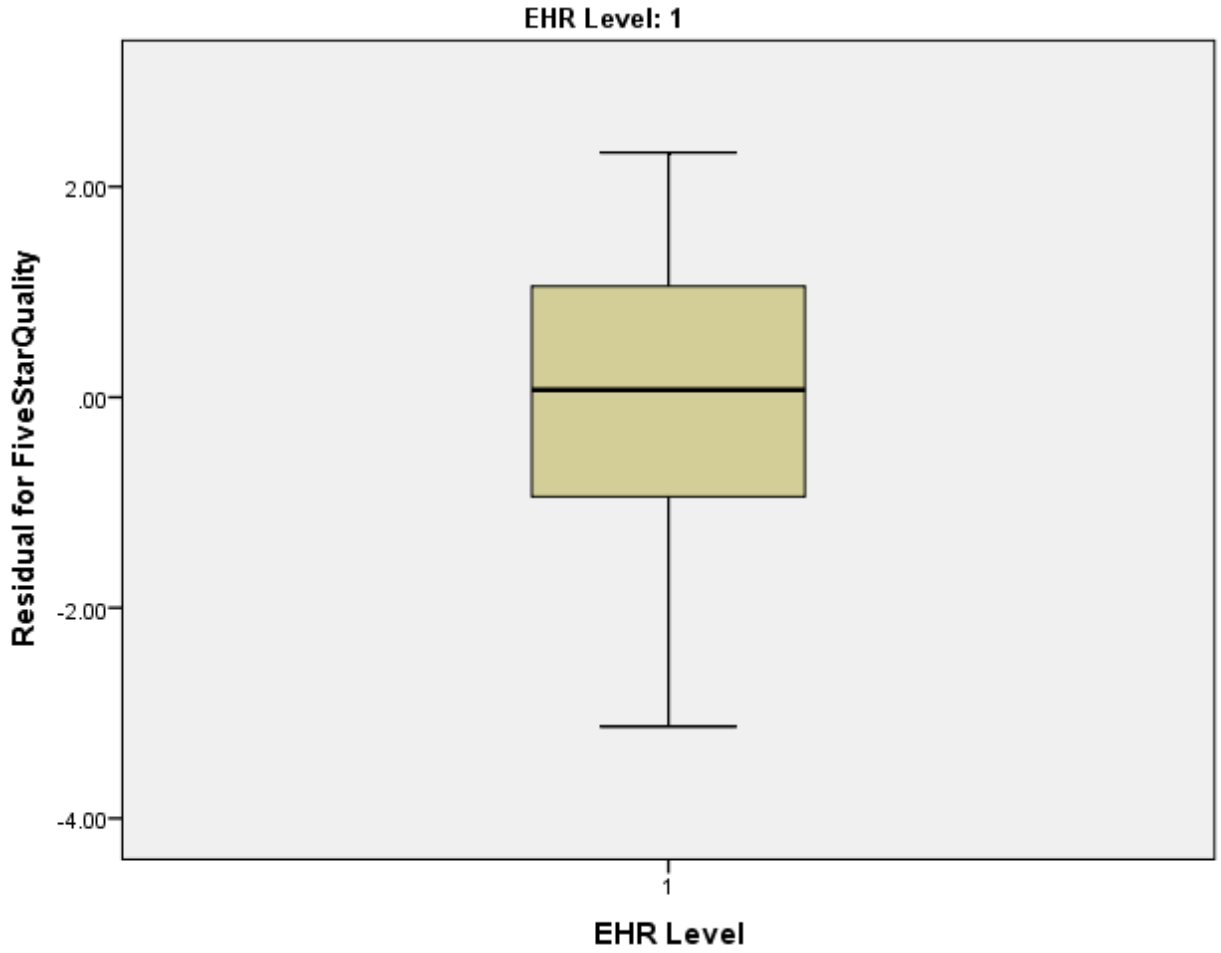

Detrended Normal Q-Q Plot of Residual for FiveStarQuality
EHR Level= 0. for EHR= 0
Dev from Normal
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-4
-3
-2
-1
0
1
2
Observed Value

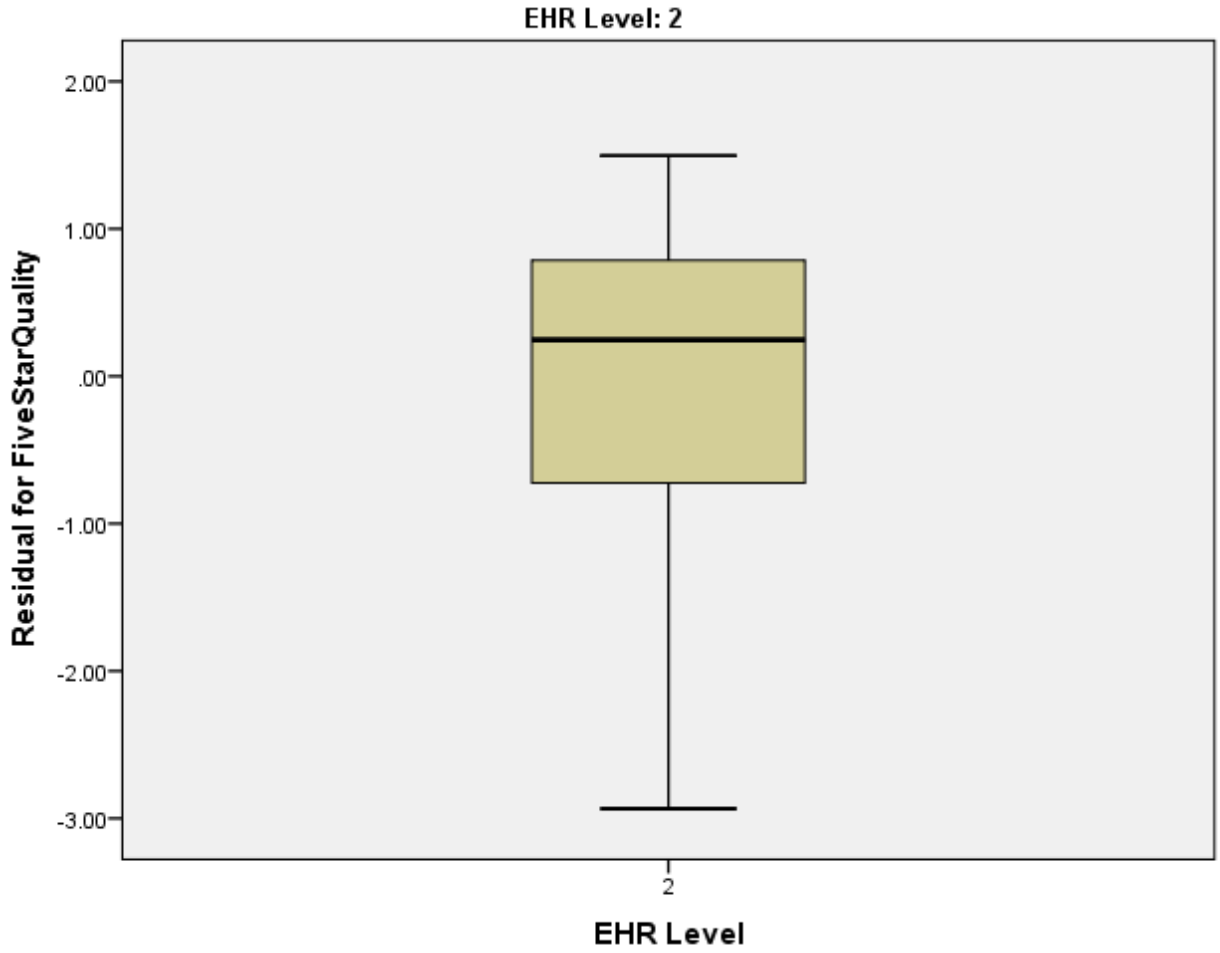

Detrended Normal Q-Q Plot of Residual for FiveStarQuality
EHR Level= 1. for EHR= 1
Dev from Normal
1.0
0.5
0.0
-0.5
-1.0
-1.5
-4
-2
0
2
Observed Value


Detrended Normal Q-Q Plot of Residual for FiveStarQuality
EHR Level= 2. for EHR= 2
Dev from Normal
0.5
0.0
-0.5
-1.0
-1.5
-3
-2
-1
0
1
2
Observed Value

Boxplots

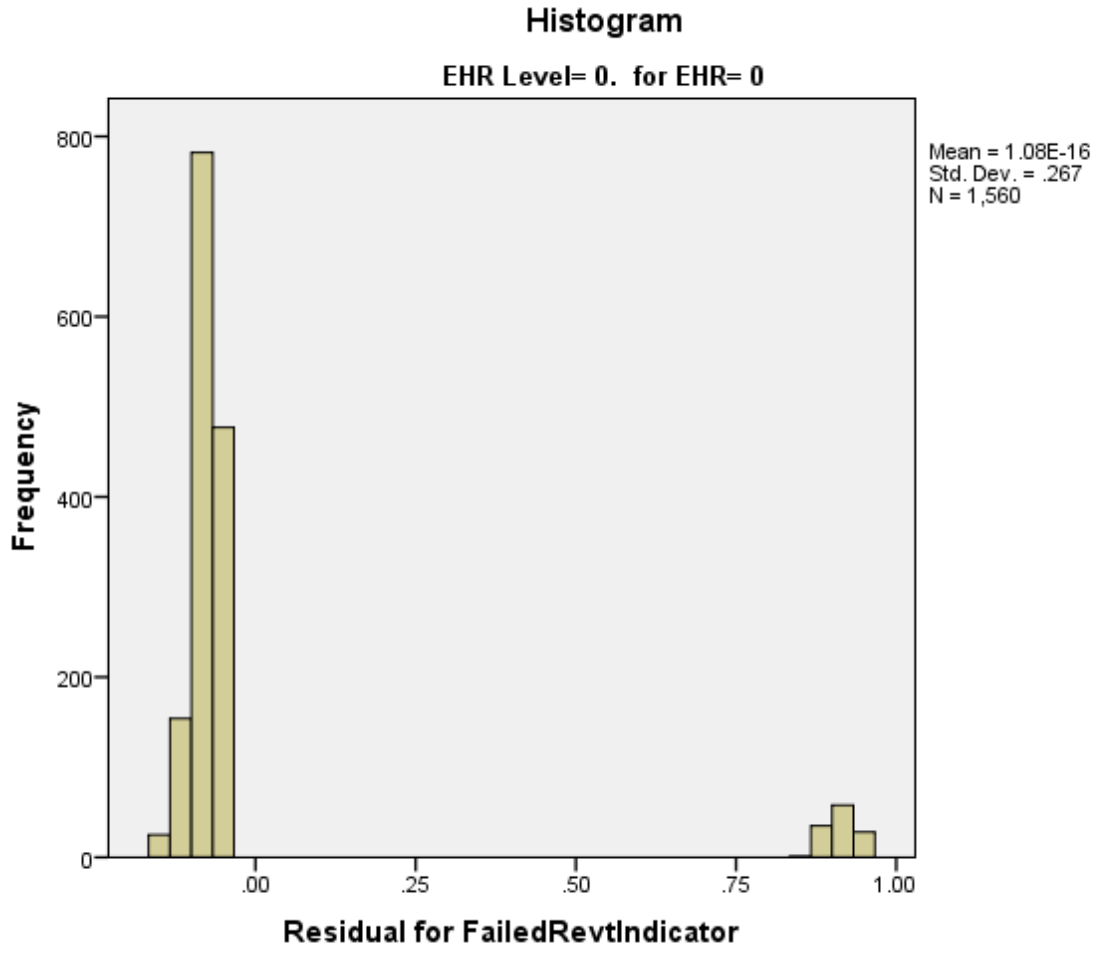

EHR Level: 0
2.00
1.00
.00
-1.00
-2.00
-3.00
-4.00
Residual for FiveStarQuality
0
EHR Level

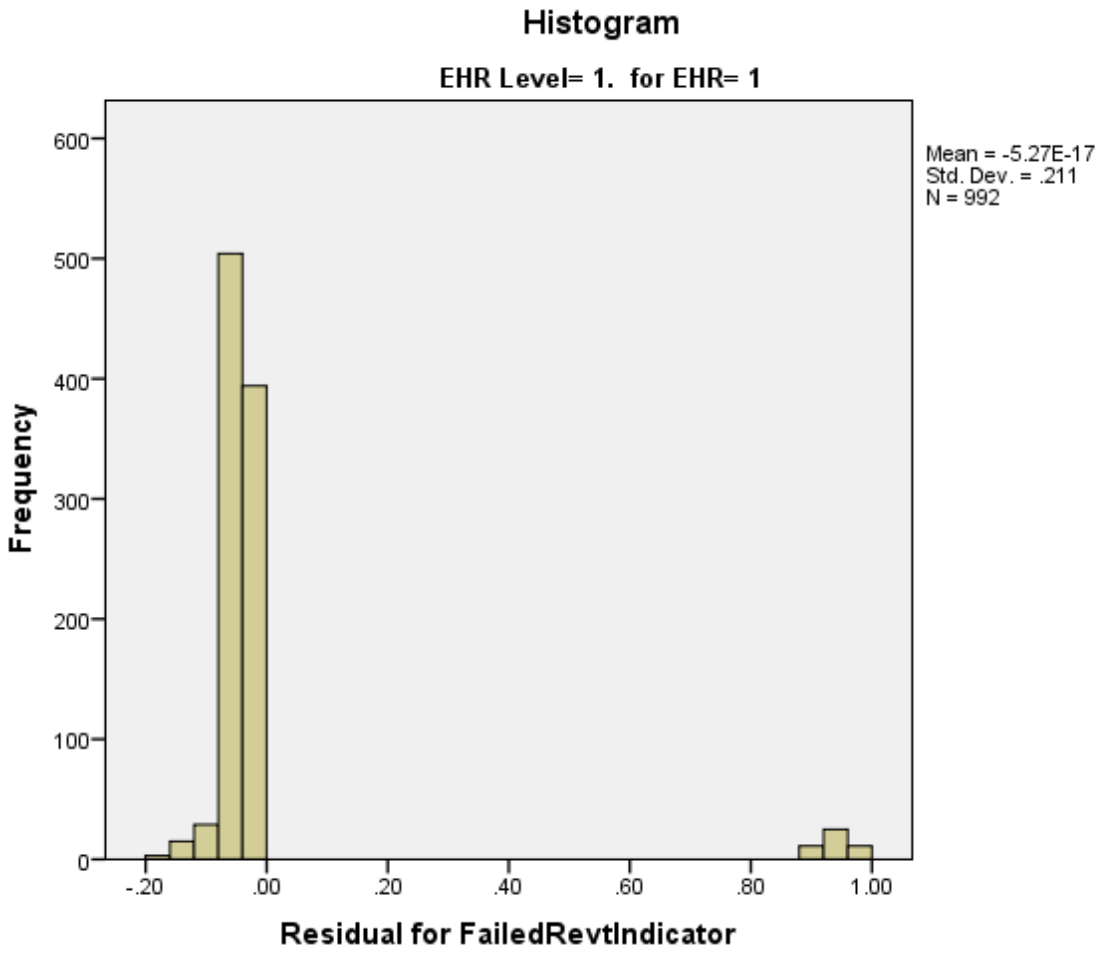

EHR Level: 1
Residual for FiveStarQuality
2.00
.00
-2.00
-4.00
1
EHR Level

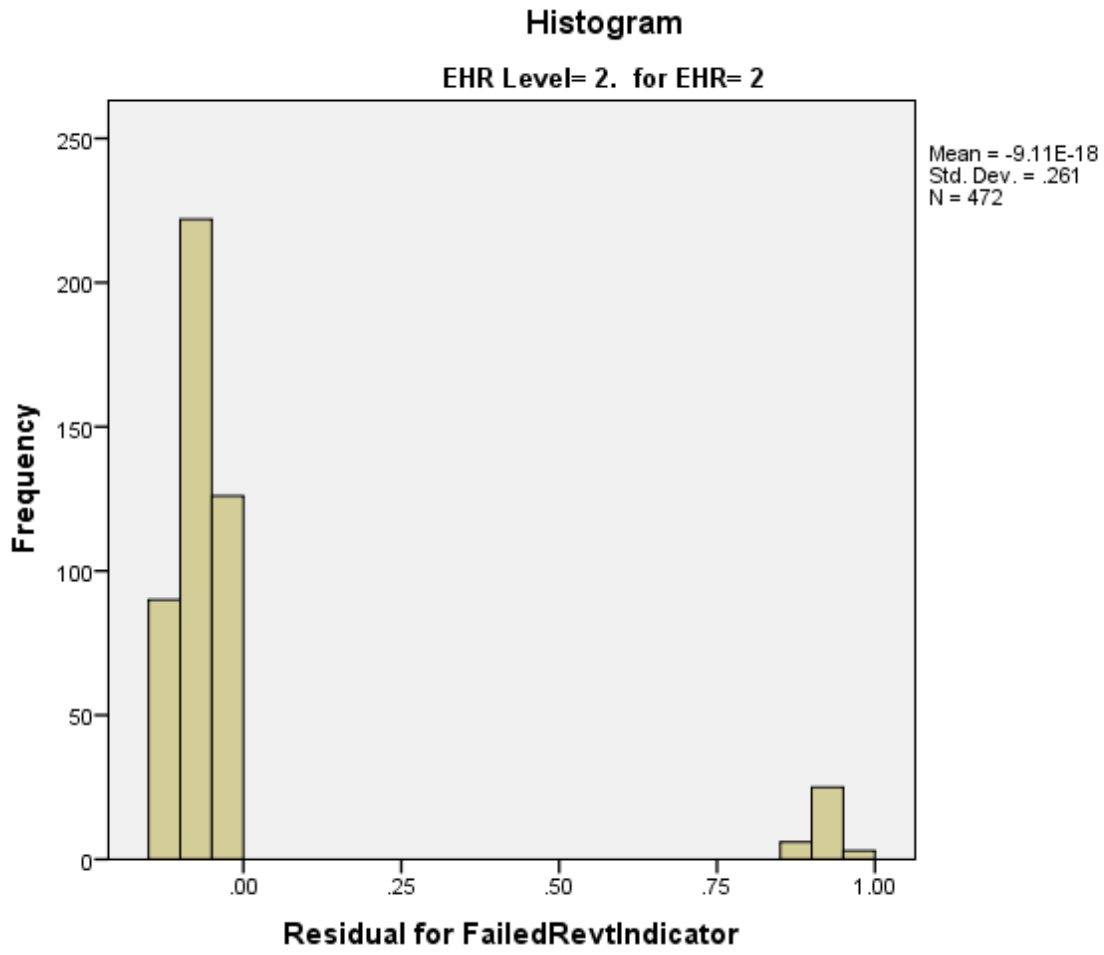


Residual for FailedRevtIndicator

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 1.08E-16
Std. Dev. = .267
N = 1,560
Frequency
800
600
400
200
0
.00
.25
.50
.75
1.00
Residual for FailedRevtIndicator


Histogram
EHR Level= 1. for EHR= 1
Mean = -5.27E-17
Std. Dev. = .211
N = 992
Frequency
600
500
400
300
200
100
0
-.20
.00
.20
.40
.60
.80
1.00
Residual for FailedRevtIndicator



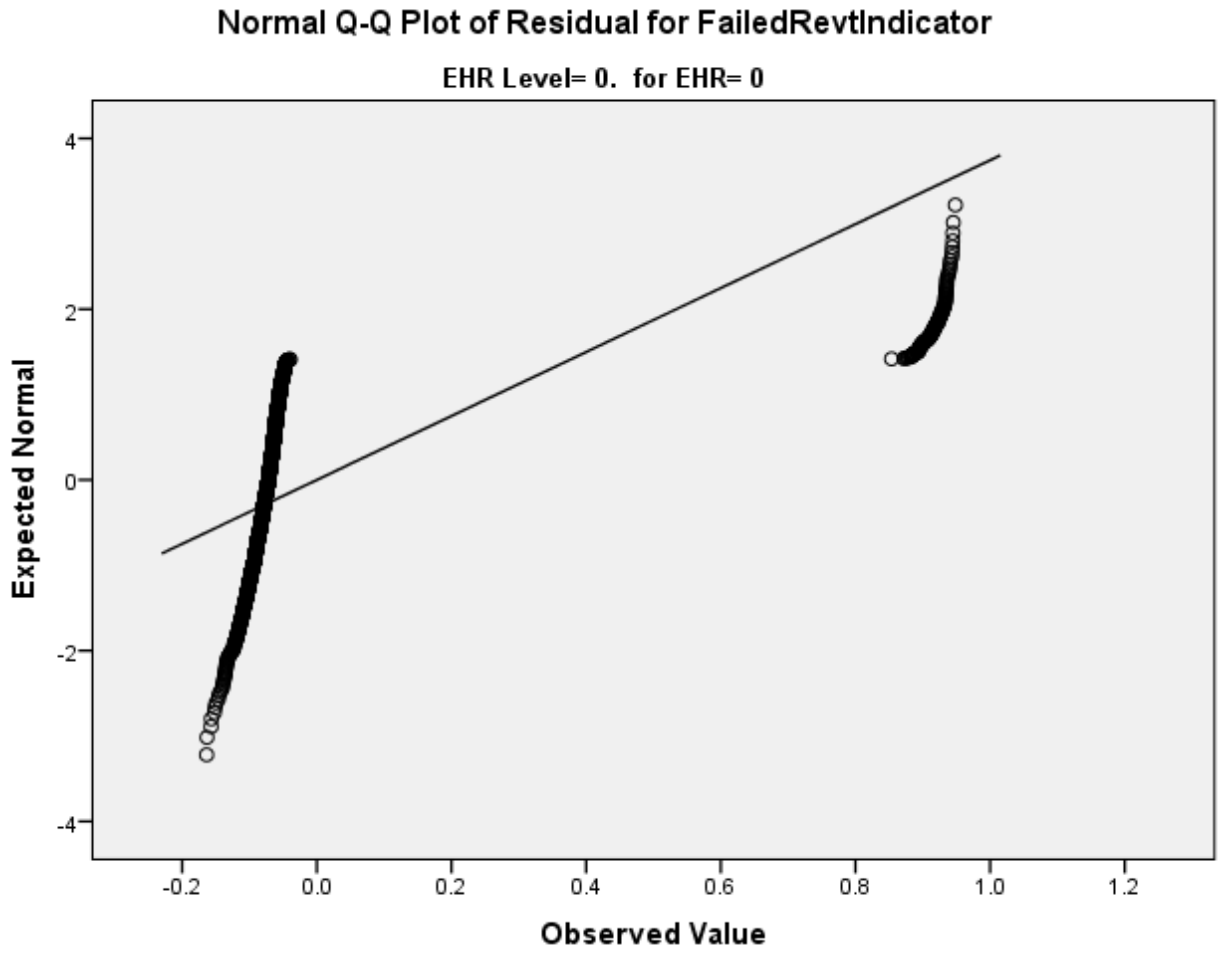
Stem-and-Leaf Plots

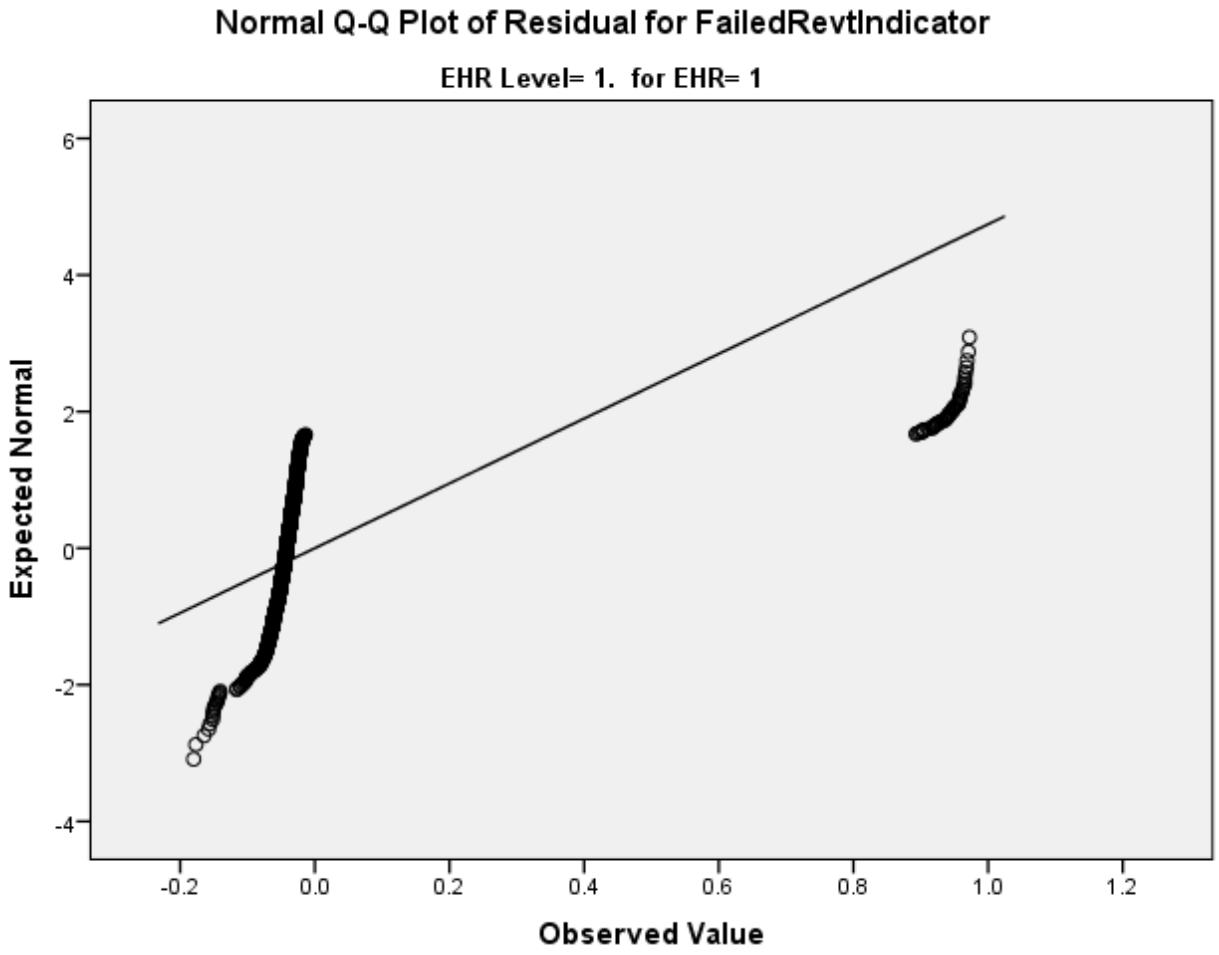
```
Residual for FailedRevtIndicator Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

    34.00 Extremes    (=<-.128)
     1.00      -12 .  &
    12.00      -12 .  02234
    18.00      -11 .  55677889
    26.00      -11 .  000122233444
```

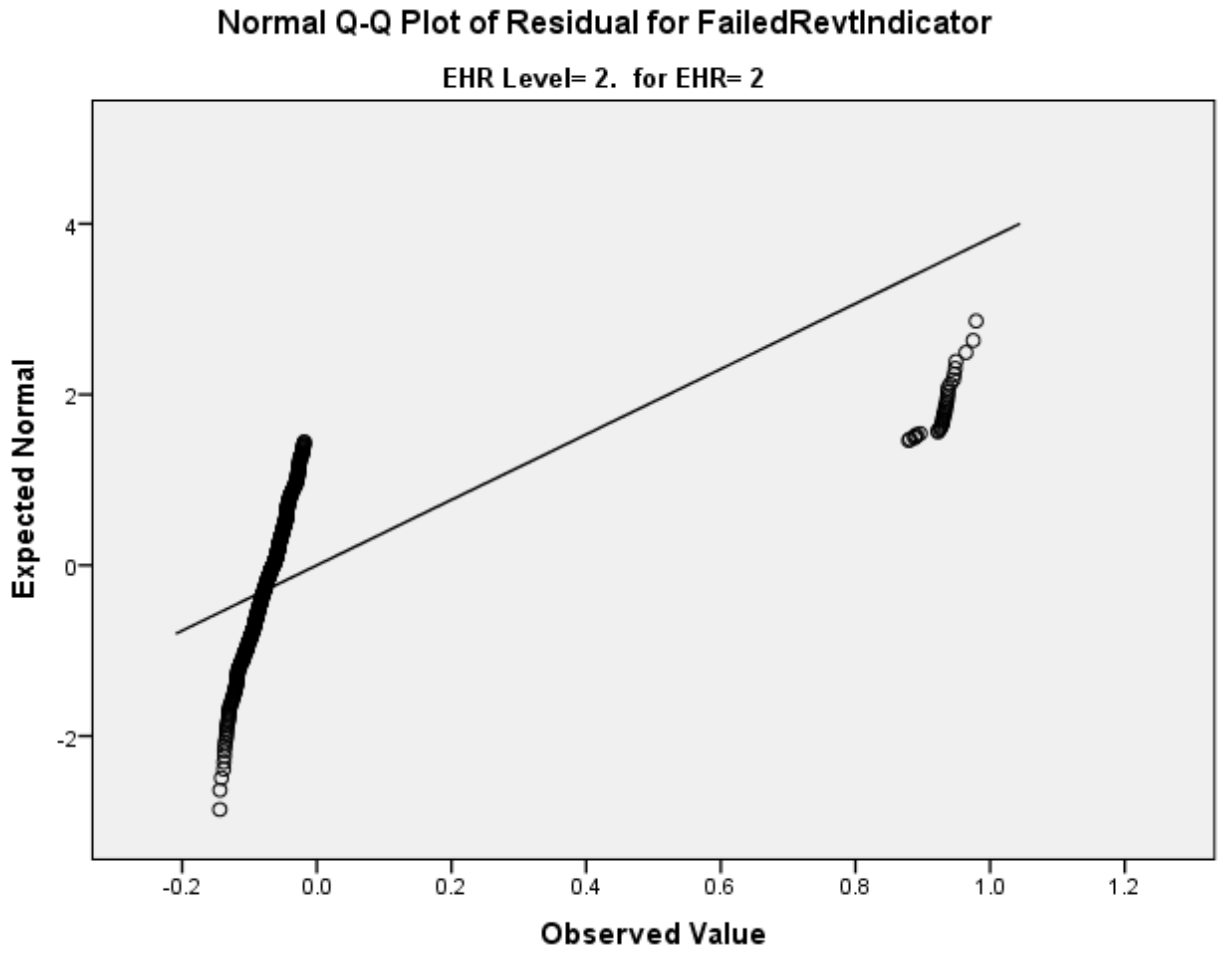
```
    37.00      -10 .  55566666777889999
    51.00      -10 .  000001111122222333344444
    60.00       -9 .  555566666777777888888899999
    86.00       -9 .  00000000011111111112222222222233333344444
   102.00       -8 .
555555555666666667777777777888888888889999999999
   124.00       -8 .
000000000000011111111111222222222222233333333333344444444444
   142.00       -7 .
555555555556666666666666666677777777788888888888888888899999999999999
   154.00       -7 .
000000000000000000001111111111111111122222222222223333333333333333344444
44444
   180.00       -6 .
555555555555555555566666666666666666677777777777777777888888888888889
99999999999999999
   179.00       -6 .
000000000000000000011111111111111112222222222222223333333333333333333
34444444444444444
   112.00       -5 .
555555555566666666667777777777788888888888999999999999
    73.00       -5 .  000001111122222333333344444444444
    40.00       -4 .  5566777777888889999
     7.00       -4 .  034
   122.00 Extremes    (>=.854)

 Stem width:       .01
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for FailedRevtIndicator Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

    40.00 Extremes    (=<-.085)
     7.00       -8 .  003&
     8.00       -7 .  668&
    22.00       -7 .  0011123344
    33.00       -6 .  555666677888889
    54.00       -6 .  000000111111111222223334 4
    50.00       -5 .  55556666667777888889999
    88.00       -5 .  000000000111111111112222223333333344444444444
   110.00       -4 .
555555555556666666666667777777778888888888999999999999
   139.00       -4 .
000000000000111111111111122222222222222223333333333334444444444444
   128.00       -3 .
555555555555555566666666667777777778888888888888999999999999999
```

```
   107.00       -3 .
00000000011111111111111222222233333333444444444444444
    94.00       -2 .  555555566666666667777777888888888888899999999
    49.00       -2 .  00001122222333333444444
    14.00       -1 .  679999&
     2.00       -1 .  &
    47.00 Extremes    (>=.893)

 Stem width:       .01
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for FailedRevtIndicator Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     3.00      -14 .  134
    18.00      -13 .  000011233344667788
    15.00      -12 .  011123345567799
    26.00      -11 .  013333455666777778889999999
    28.00      -10 .  0011122222333335677778888899
    35.00       -9 .  00111112222222333344445556777888889
    48.00       -8 .  001111111122222333344455555666667777777888899999
    42.00       -7 .  00111122223333444444555556666777888888999
    38.00       -6 .  000111222222333345555666778888889999999
    59.00       -5 .
0000011111222333333344445555556666666777777788888889999999
    60.00       -4 .
000001112222233333334444444444444555566666667777788899999999
    25.00       -3 .  000001233344456677788899999
    36.00       -2 .  000111124444555566666667778888888899
     5.00       -1 .  88999
    34.00 Extremes    (>=.879)

 Stem width:       .01
 Each leaf:        1 case(s)
```

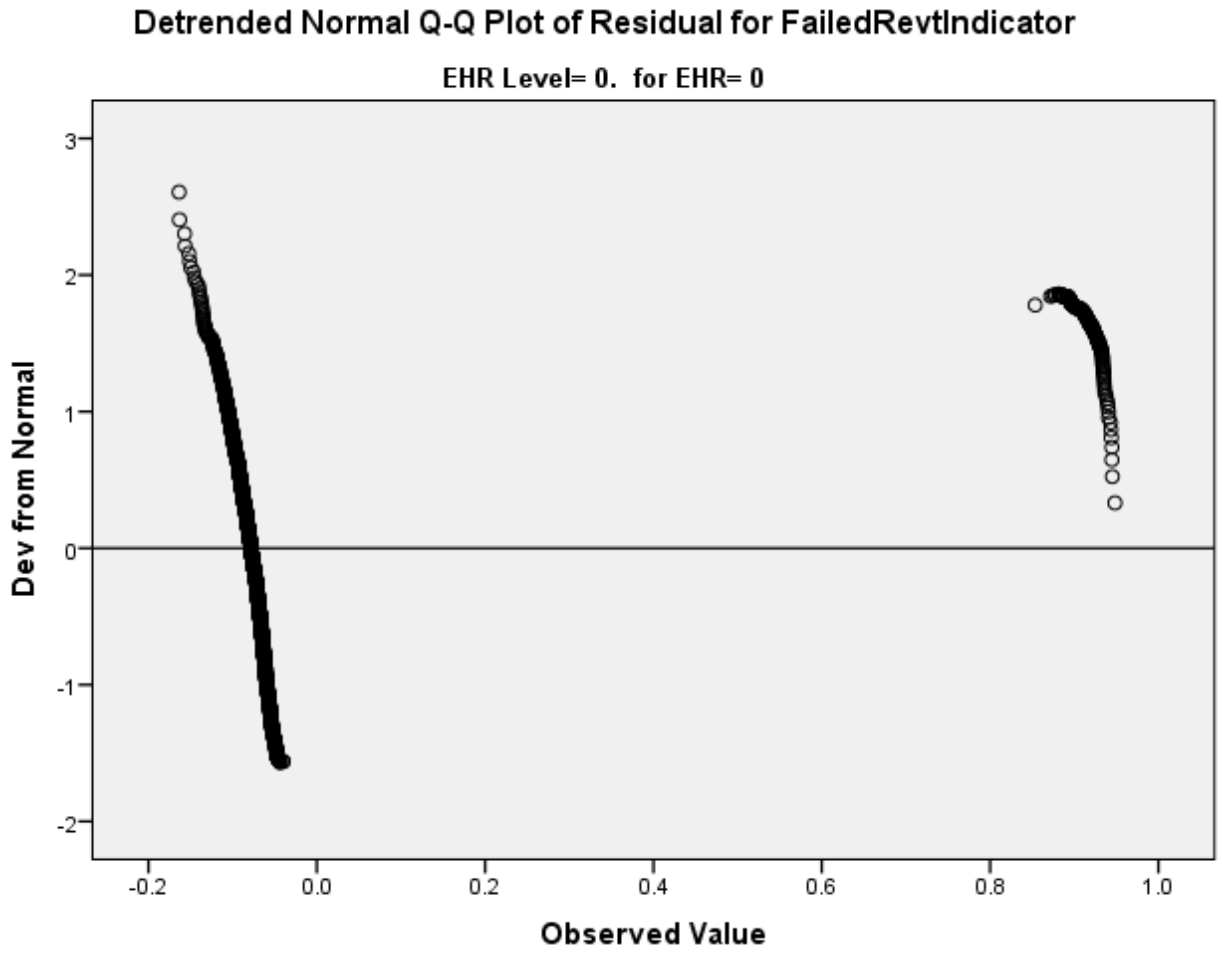
Normal Q-Q Plots

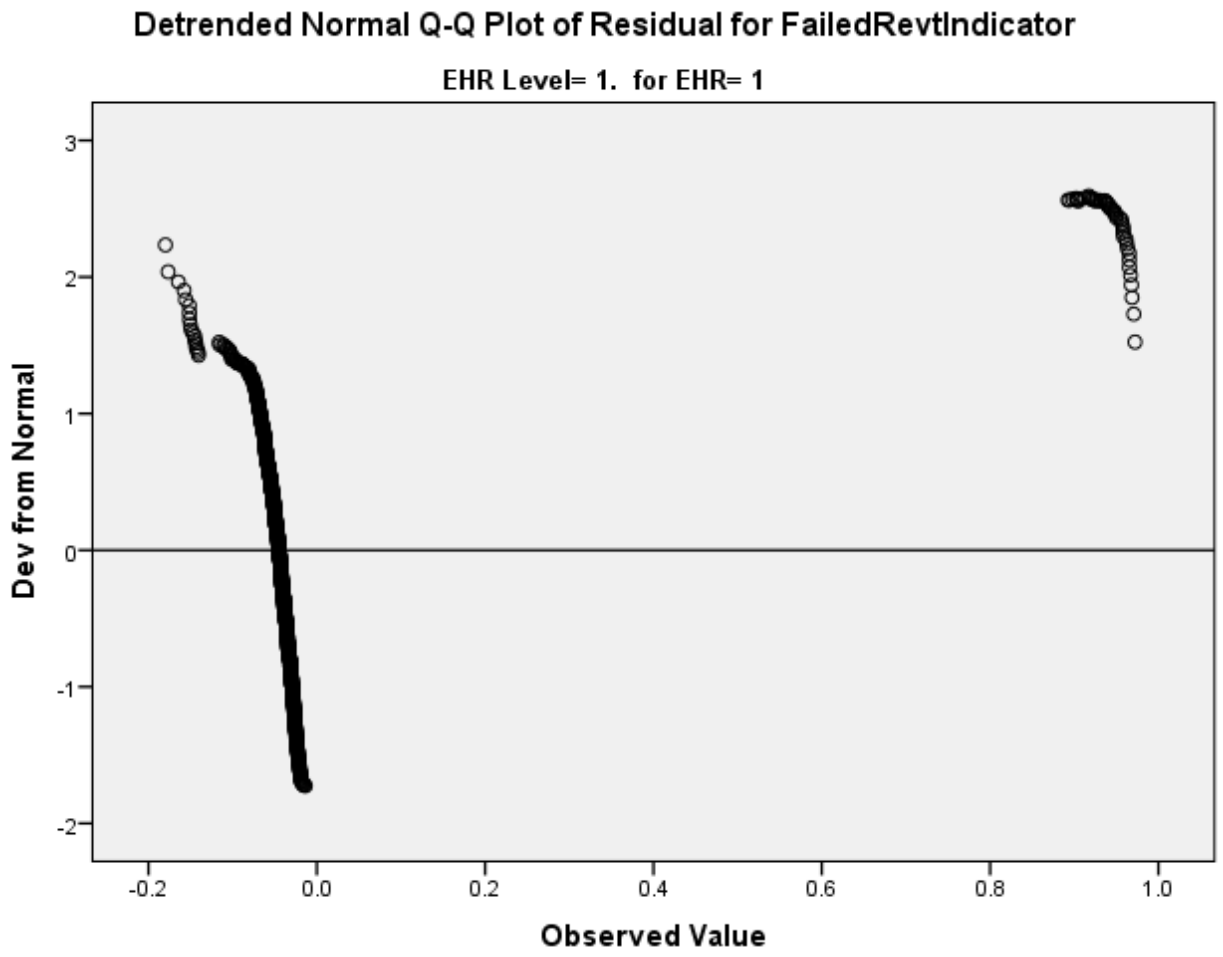

Normal Q-Q Plot of Residual for FailedRevtIndicator
EHR Level= 0. for EHR= 0
Expected Normal
Observed Value
4
2
0
-2
-4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
1.2

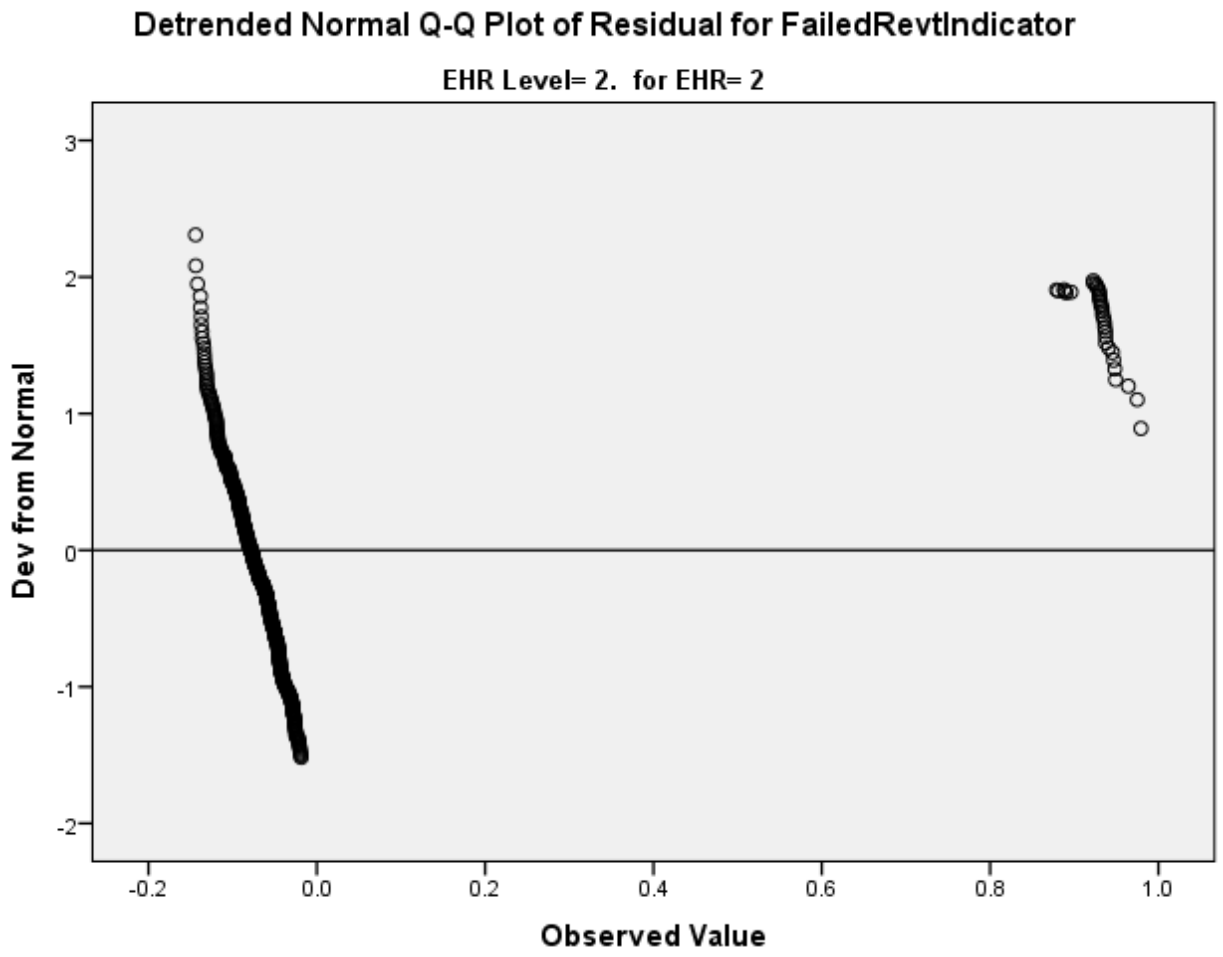

Normal Q-Q Plot of Residual for FailedRevtIndicator
EHR Level= 1. for EHR= 1
Expected Normal
6
4
2
0
-2
-4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Observed Value



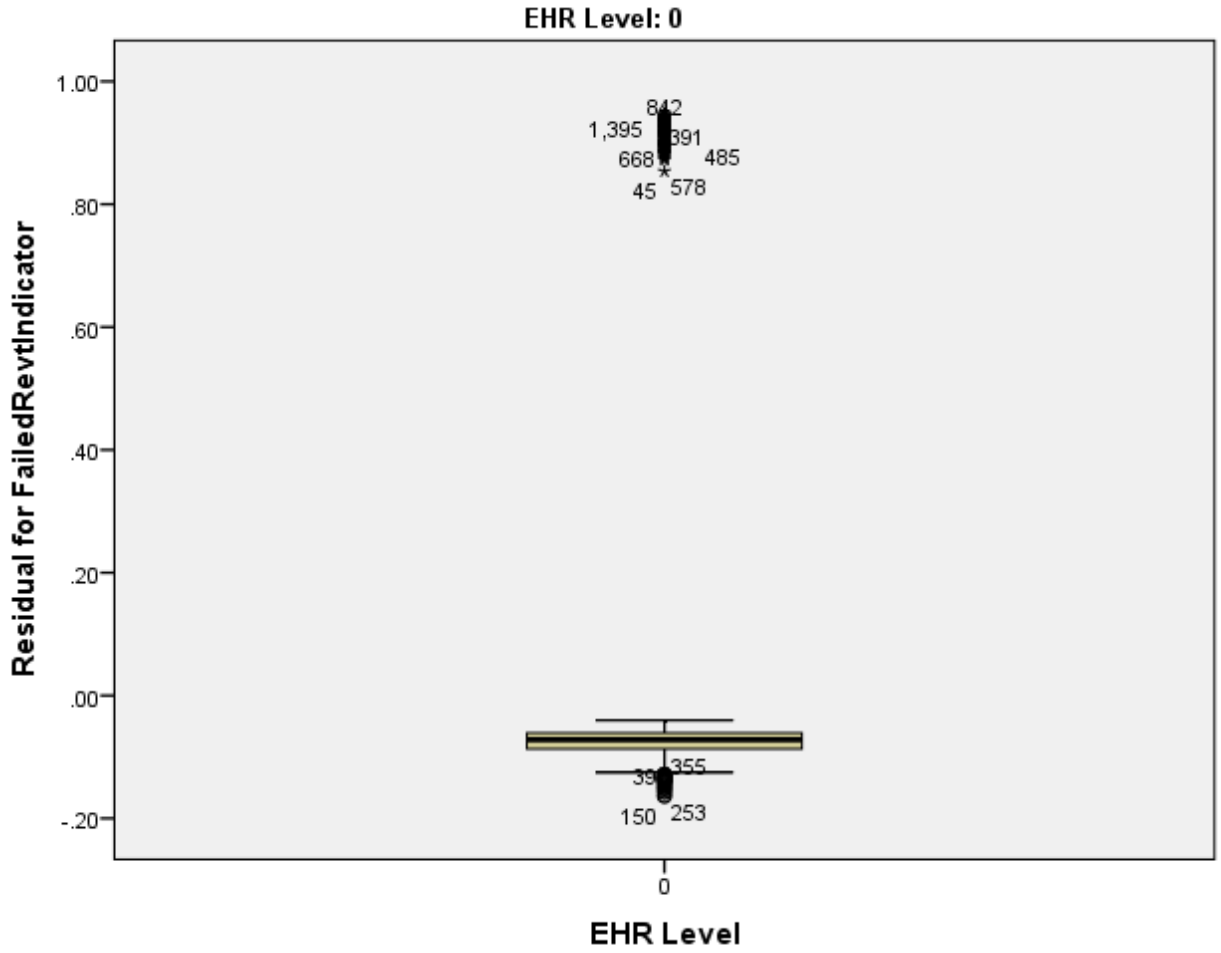
Detrended Normal Q-Q Plots

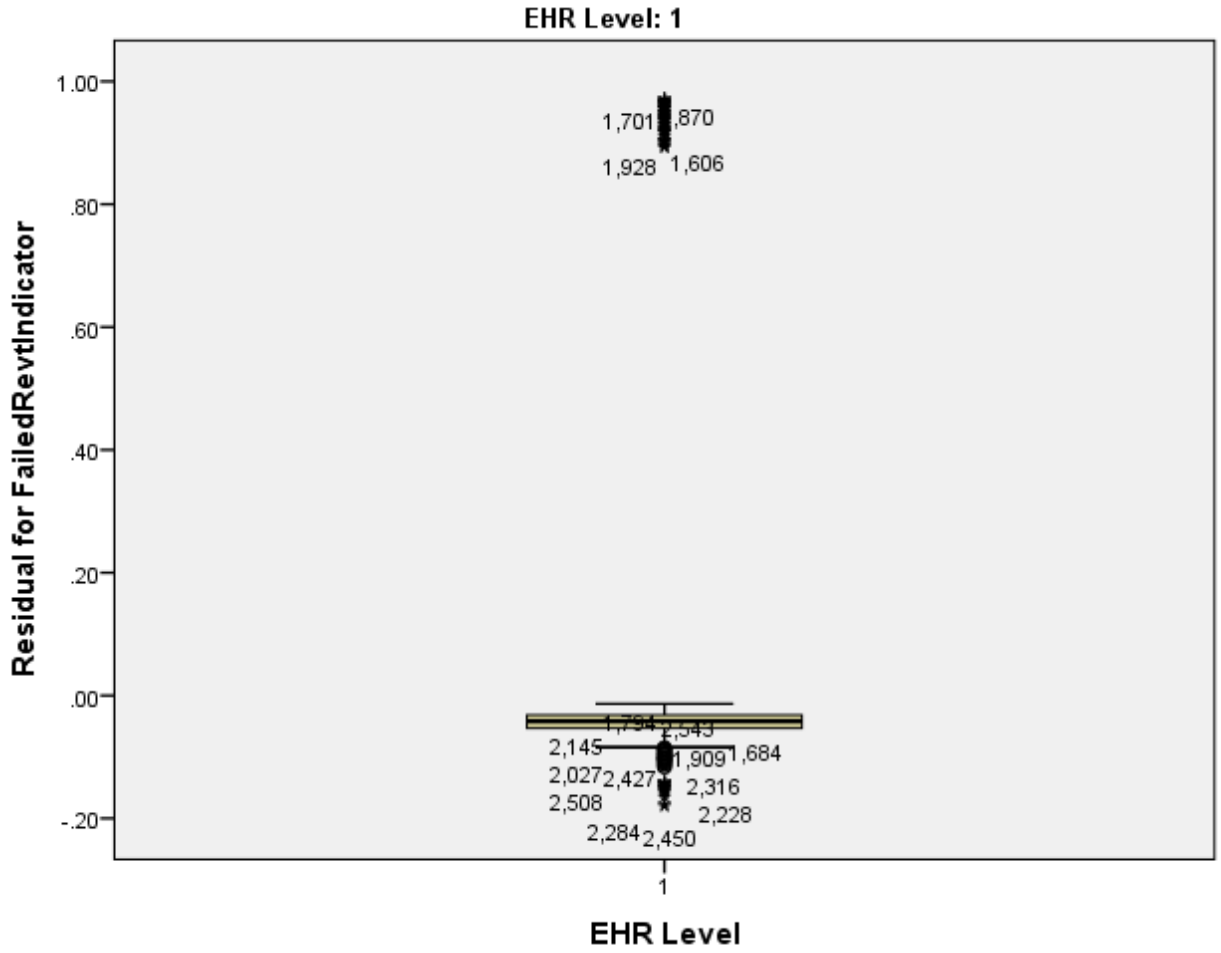

Detrended Normal Q-Q Plot of Residual for FailedRevtIndicator
EHR Level= 0. for EHR= 0
Dev from Normal
3
2
1
0
-1
-2
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
Observed Value

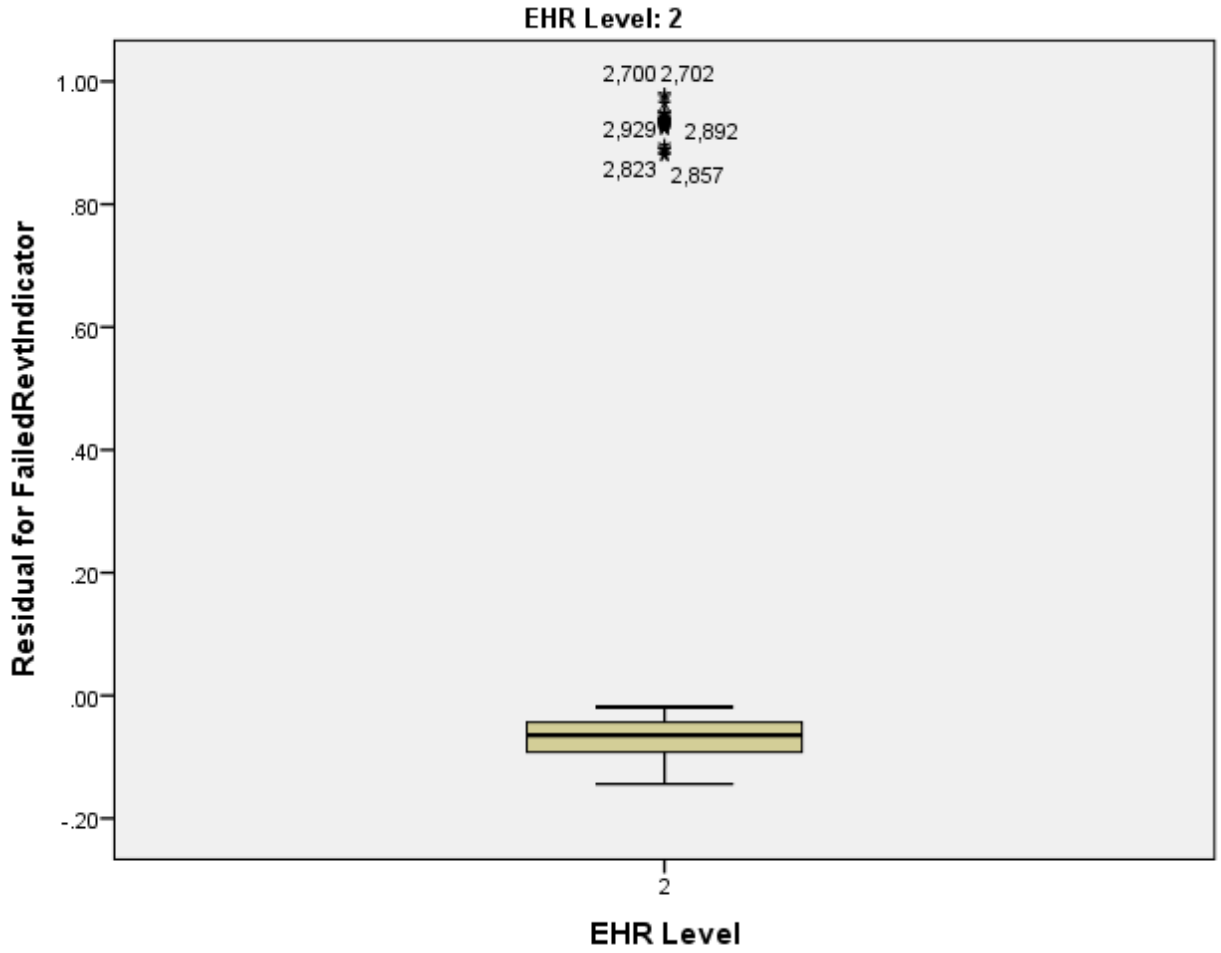

Detrended Normal Q-Q Plot of Residual for FailedRevtIndicator
EHR Level= 1. for EHR= 1
Dev from Normal
3
2
1
0
-1
-2
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
Observed Value


Detrended Normal Q-Q Plot of Residual for FailedRevtIndicator
EHR Level= 2. for EHR= 2
Dev from Normal
3
2
1
0
-1
-2
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
Observed Value

Boxplots

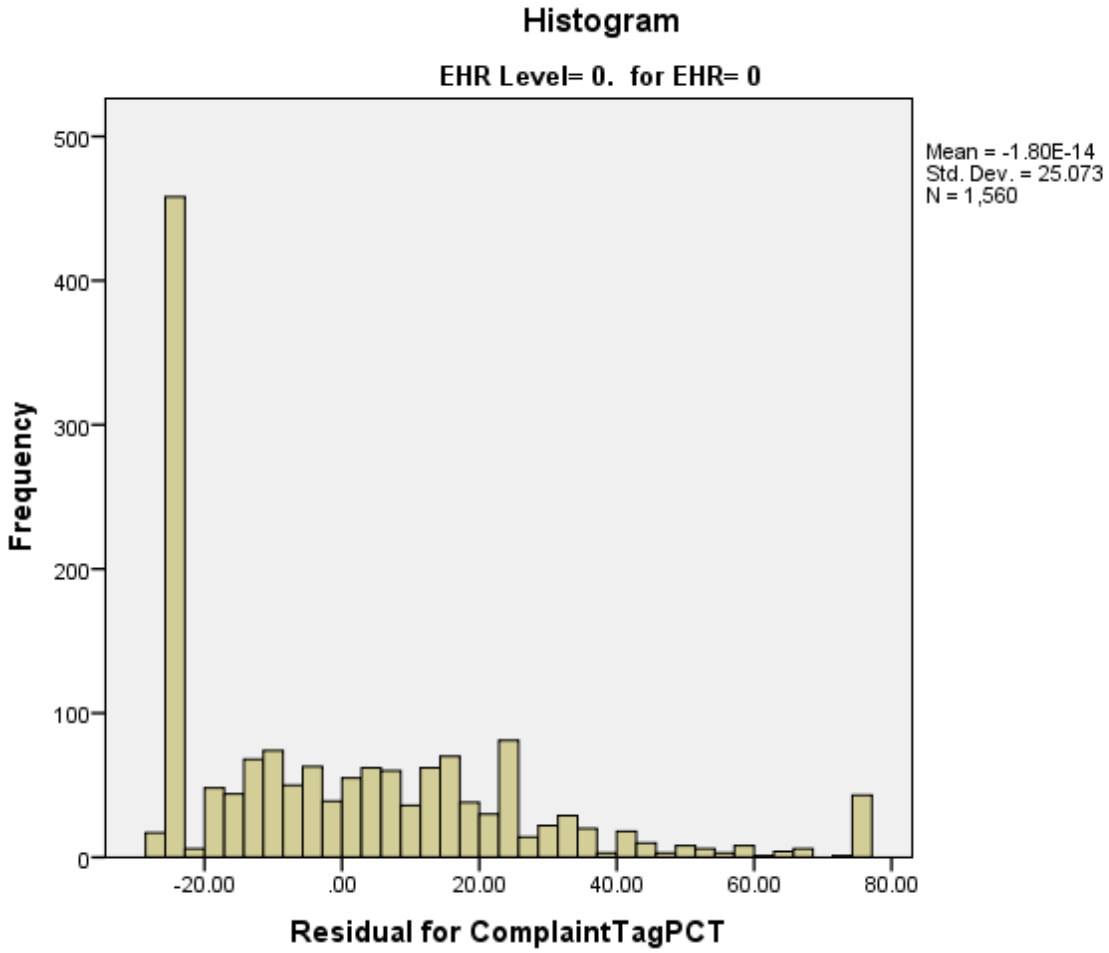

EHR Level: 0
Residual for FailedRevtIndicator
1.00
.80
.60
.40
.20
.00
-.20
842
1,395
391
668
485
45
578
355
39
150
253
0
EHR Level

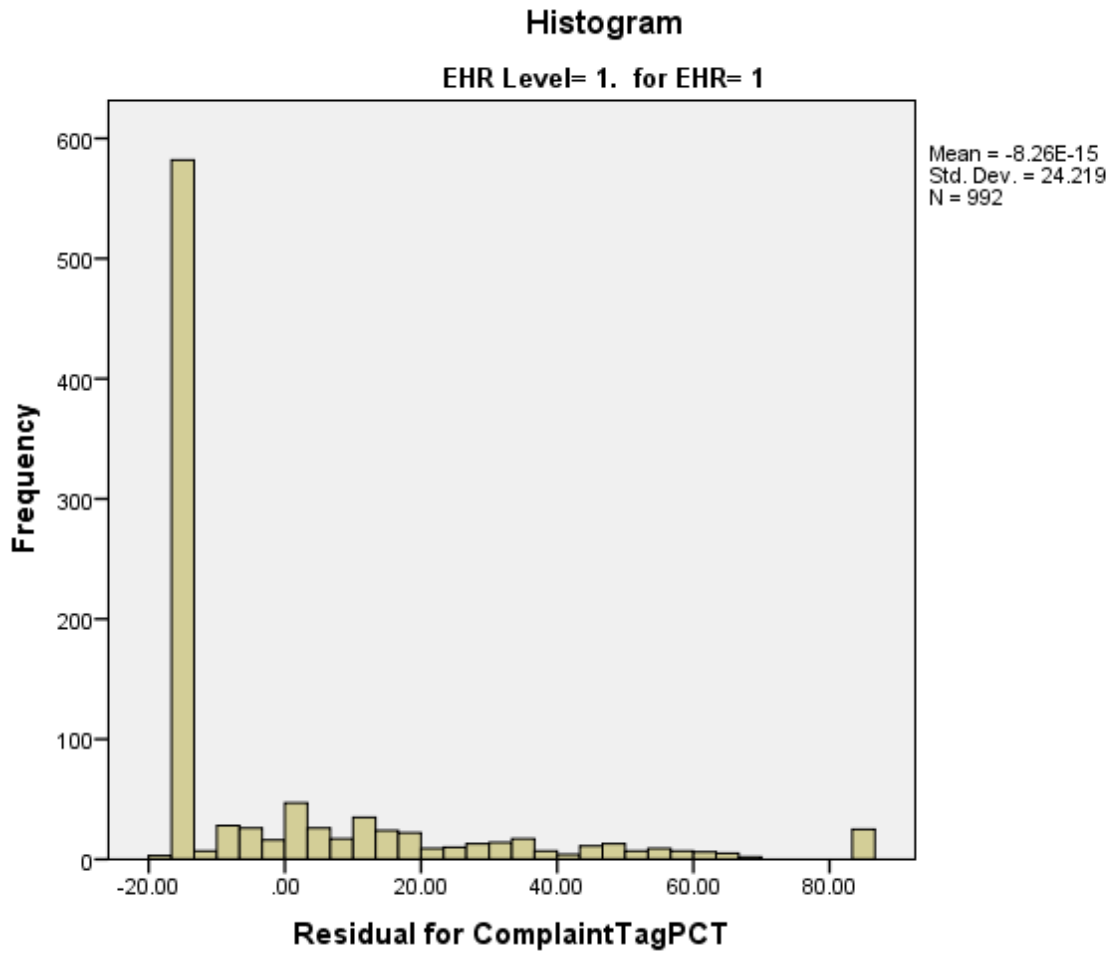

EHR Level: 1
Residual for FailedRevtIndicator
1.00
.80
.60
.40
.20
.00
-.20
1,701
,870
1,928
1,606
1,794
2,145
1,909
1,684
2,027
2,427
2,316
2,508
2,228
2,284
2,450
1
EHR Level

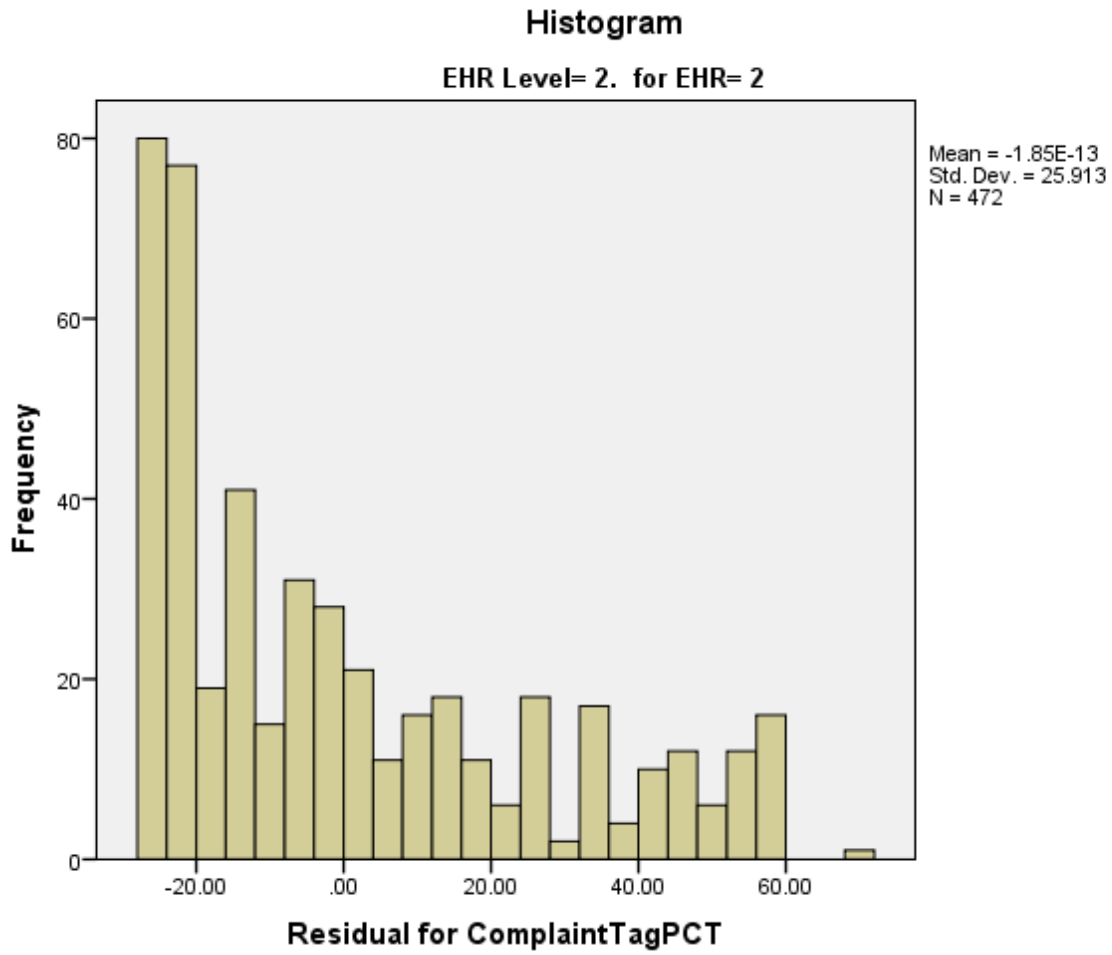


Residual for ComplaintTagPCT

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = -1.80E-14
Std. Dev. = 25.073
N = 1,560
Frequency
500
400
300
200
100
0
-20.00
.00
20.00
40.00
60.00
80.00
Residual for ComplaintTagPCT


Histogram
EHR Level= 1. for EHR= 1
Mean = -8.26E-15
Std. Dev. = 24.219
N = 992
Frequency
600
500
400
300
200
100
0
-20.00
.00
20.00
40.00
60.00
80.00
Residual for ComplaintTagPCT



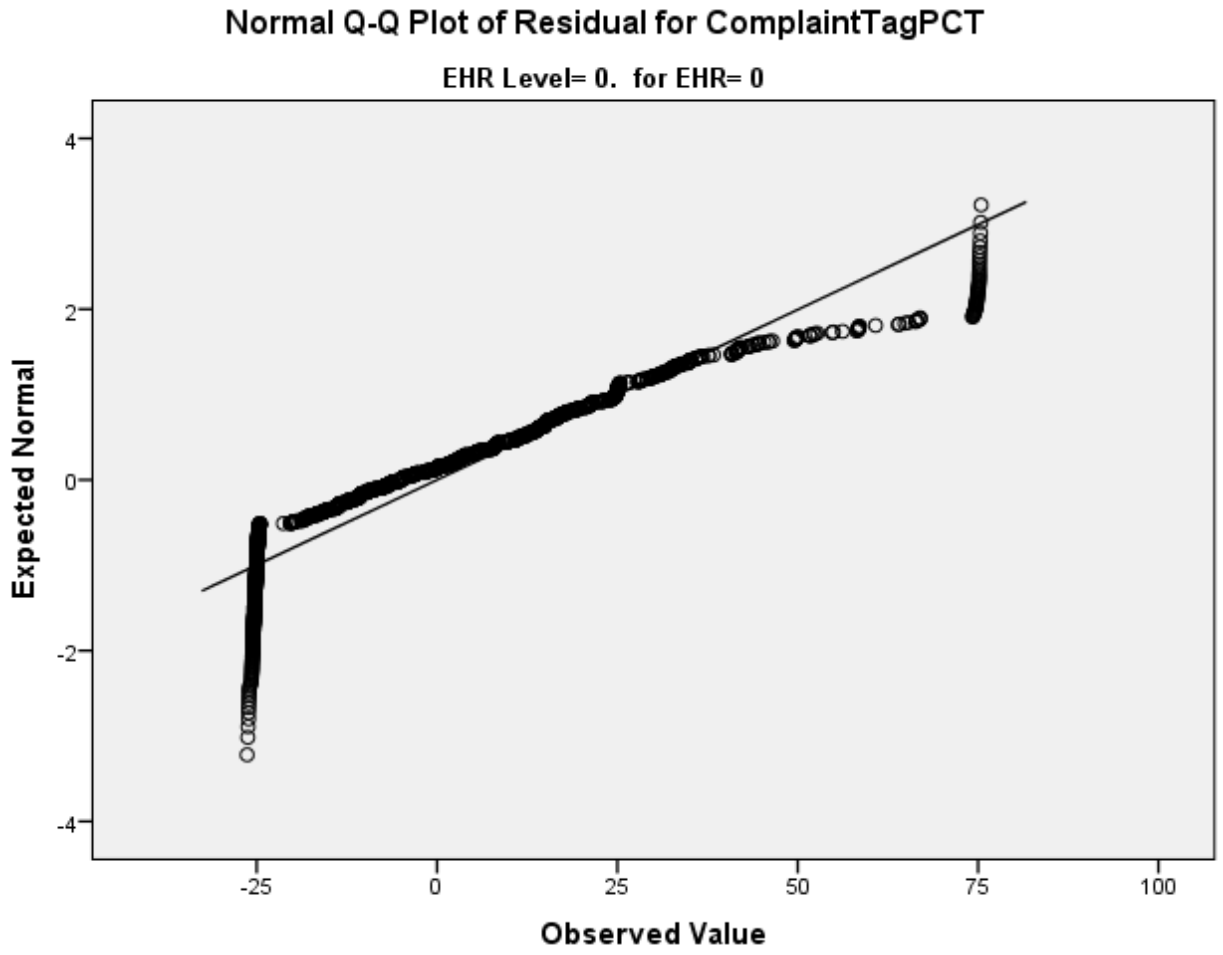
Stem-and-Leaf Plots

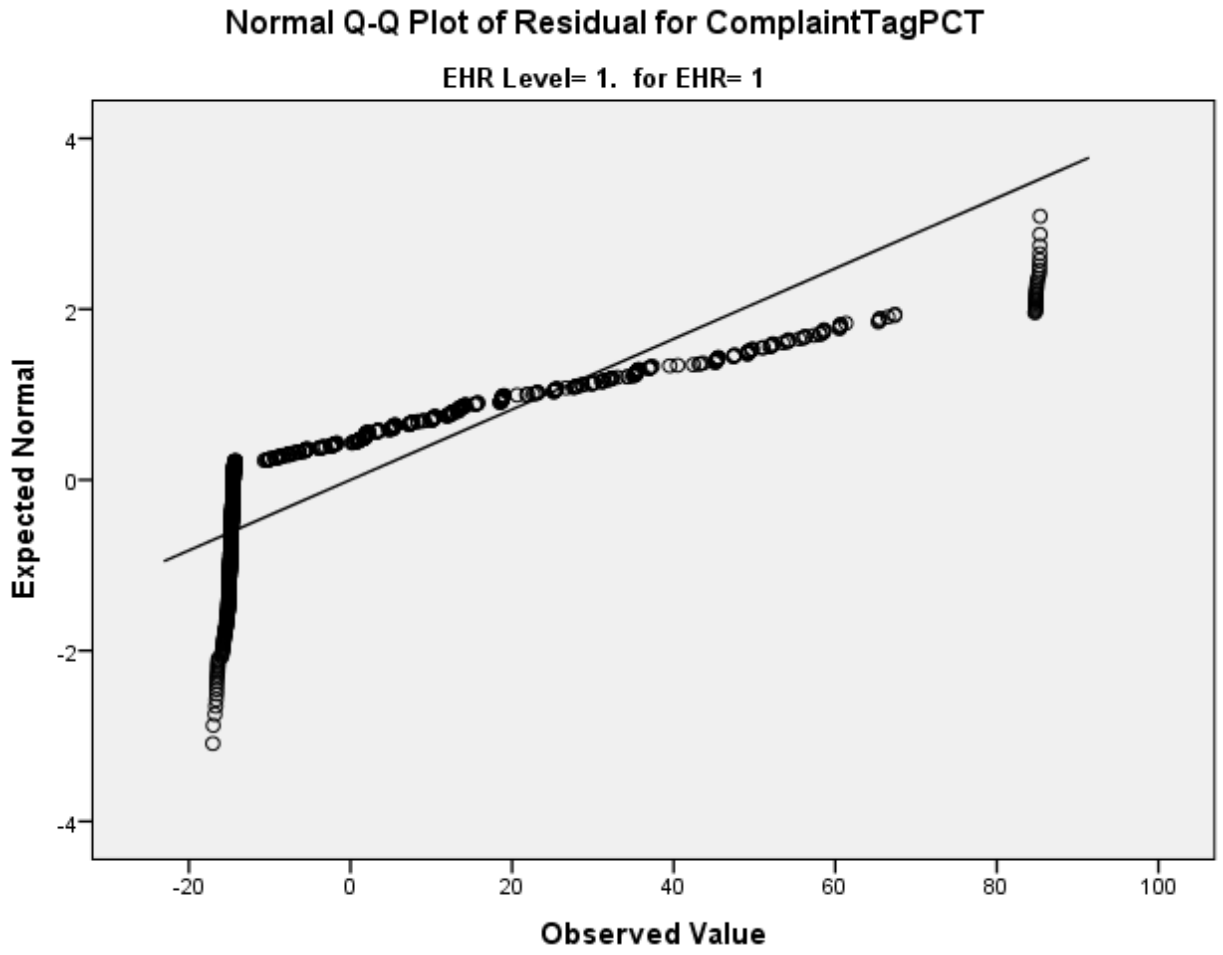
```
Residual for ComplaintTagPCT Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

   262.00       -2 .
55555555555555555555555555555555555555555555555555555555555555555555555555555555
5555555555556666
   219.00       -2 .
00444444444444444444444444444444444444444444444444444444444444444444444444444444
```

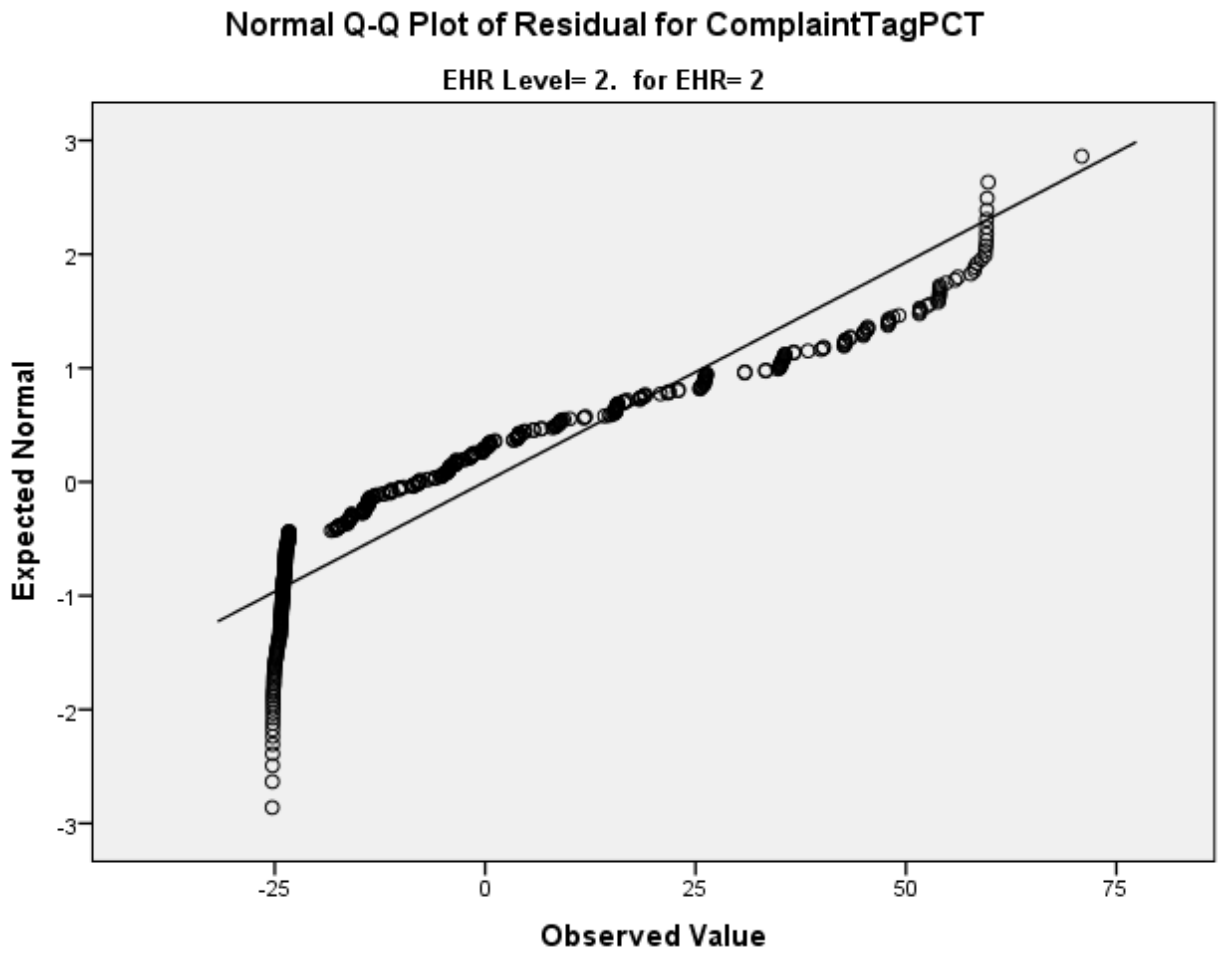
```
44&
    87.00       -1 .  55555556666667777788888889999
   120.00       -1 .  000000000000011112222222333333333334444
    96.00       -0 .  555555666666667777788888999999
    83.00       -0 .  000000111112223333333444444
    97.00        0 .  0000011111112222222223333333344
    92.00        0 .  55555555667777777888888889999
   104.00        1 .  000111111122222223333333344444444
    90.00        1 .  555555555666666667777778889999
    82.00        2 .  000011111223344444444444444
    52.00        2 .  555555555567888999
    48.00        3 .  0011112222233344
    17.00        3 .  555667&
    27.00        4 .  0011112334
    11.00        4 .  5699
     9.00        5 .  124&
     9.00        5 .  888&
     4.00        6 .  4&
     7.00        6 .  66&
    24.00        7 .  44444444
     4.00        7 .  5
    16.00 Extremes    (>=75)

 Stem width:     10.00
 Each leaf:        3 case(s)



 & denotes fractional leaves.



Residual for ComplaintTagPCT Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

   116.00       -1 .  5555555555555555555666&
   476.00       -1 .
04444444444444444444444444444444444444444444444444444444444444444444444444444
444444444444444444444
    46.00       -0 .  5556677889
    24.00       -0 .  12233
    56.00        0 .  0011111112334
    34.00        0 .  5557789
    53.00        1 .  0002223334&
    28.00        1 .  58888&
     9.00        2 .  3&
    23.00        2 .  55789&
    17.00        3 .  124&
    21.00        3 .  5557&
     1.00        4 .  &
    88.00 Extremes    (>=42)
```

```
 Stem width:     10.00
 Each leaf:        5 case(s)


 & denotes fractional leaves.



Residual for ComplaintTagPCT Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

   157.00       -2 .
333333333333333333333333333333333333333444444444444444444444444444455555
5555555
    70.00       -1 .  00111223333333444444555566667778
    64.00       -0 .  000111123333444444455677788&
    44.00        0 .  0000013333444568888889&
    33.00        1 .  14555555566888&
    24.00        2 .  12555666666&
    23.00        3 .  0355555556&
    24.00        4 .  0222345577&
    32.00        5 .  11233348899999&
      .00        6 .
     1.00        7 .  &

 Stem width:     10.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

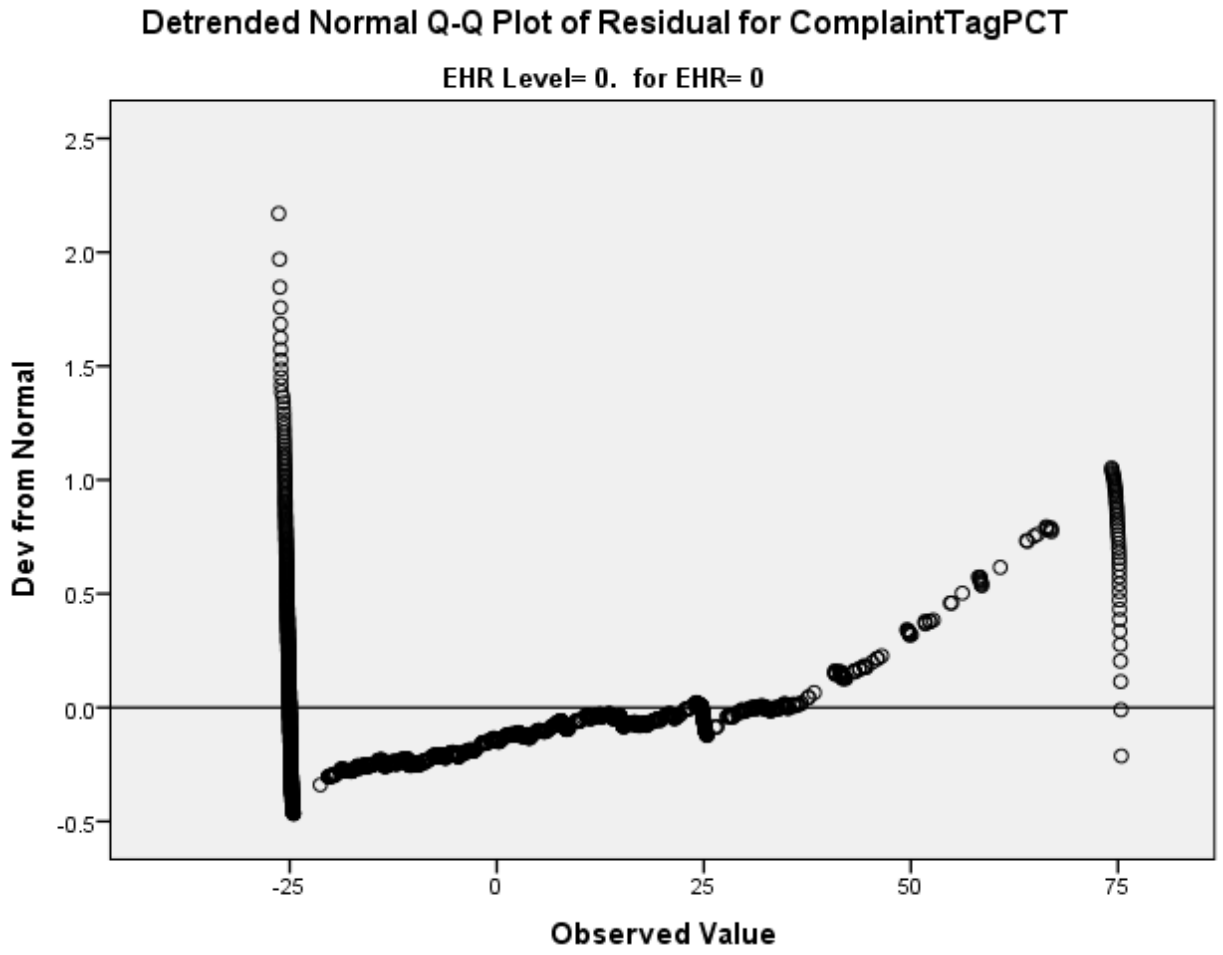
Normal Q-Q Plots

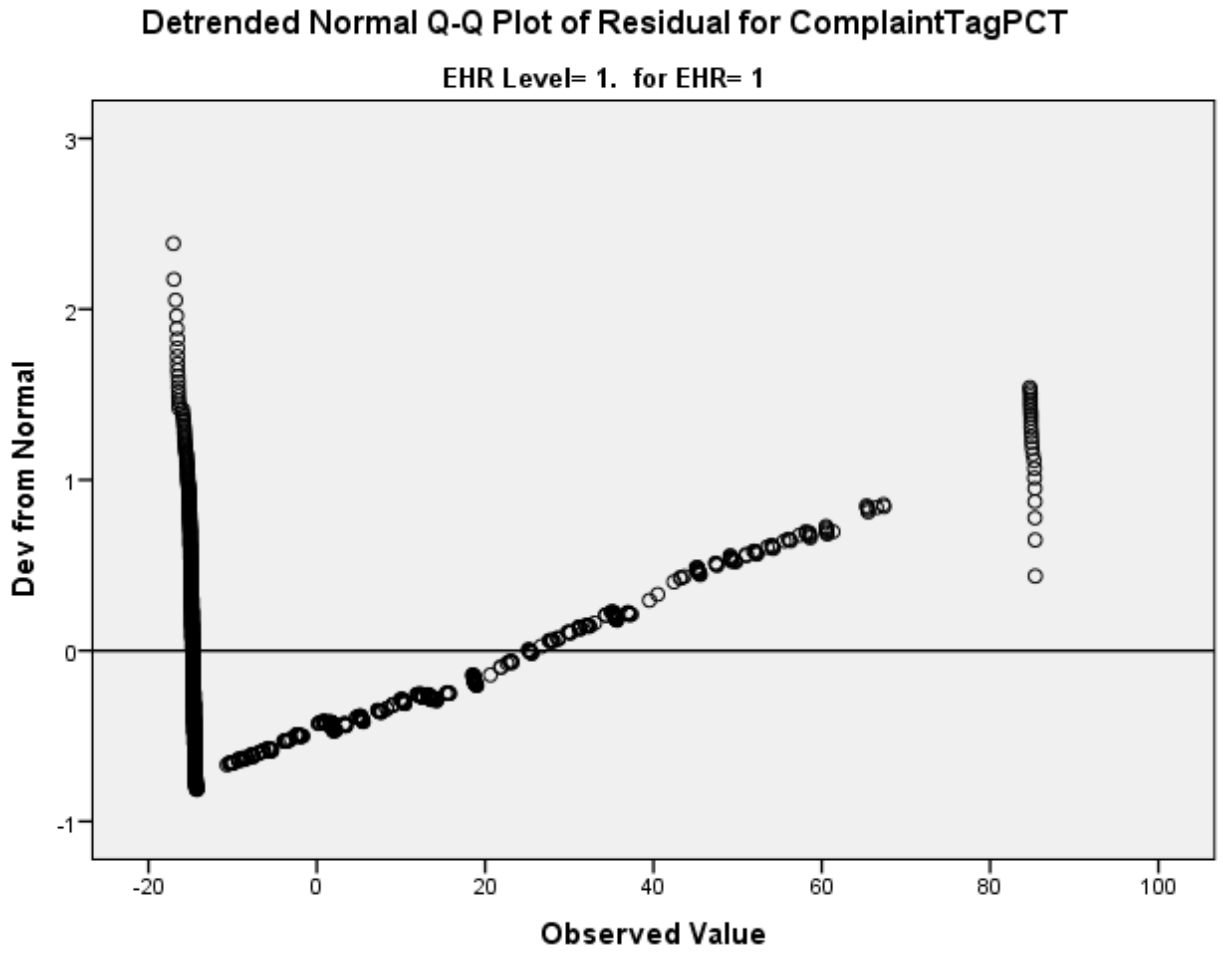

Normal Q-Q Plot of Residual for ComplaintTagPCT
EHR Level= 0. for EHR= 0
Expected Normal
4
2
0
-2
-4
-25
0
25
50
75
100
Observed Value

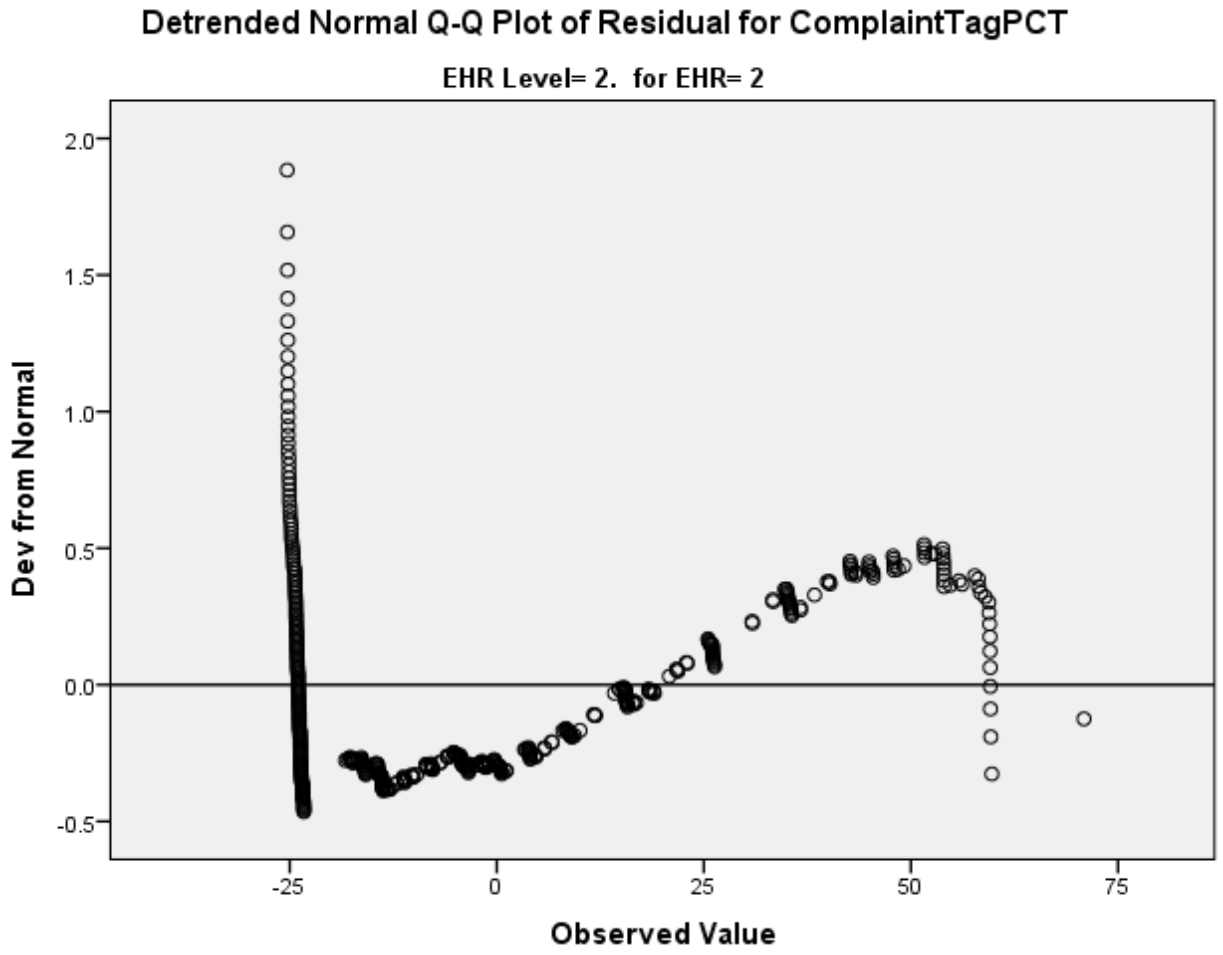

Normal Q-Q Plot of Residual for ComplaintTagPCT
EHR Level= 1. for EHR= 1
Expected Normal
Observed Value
4
2
0
-2
-4
-20
0
20
40
60
80
100



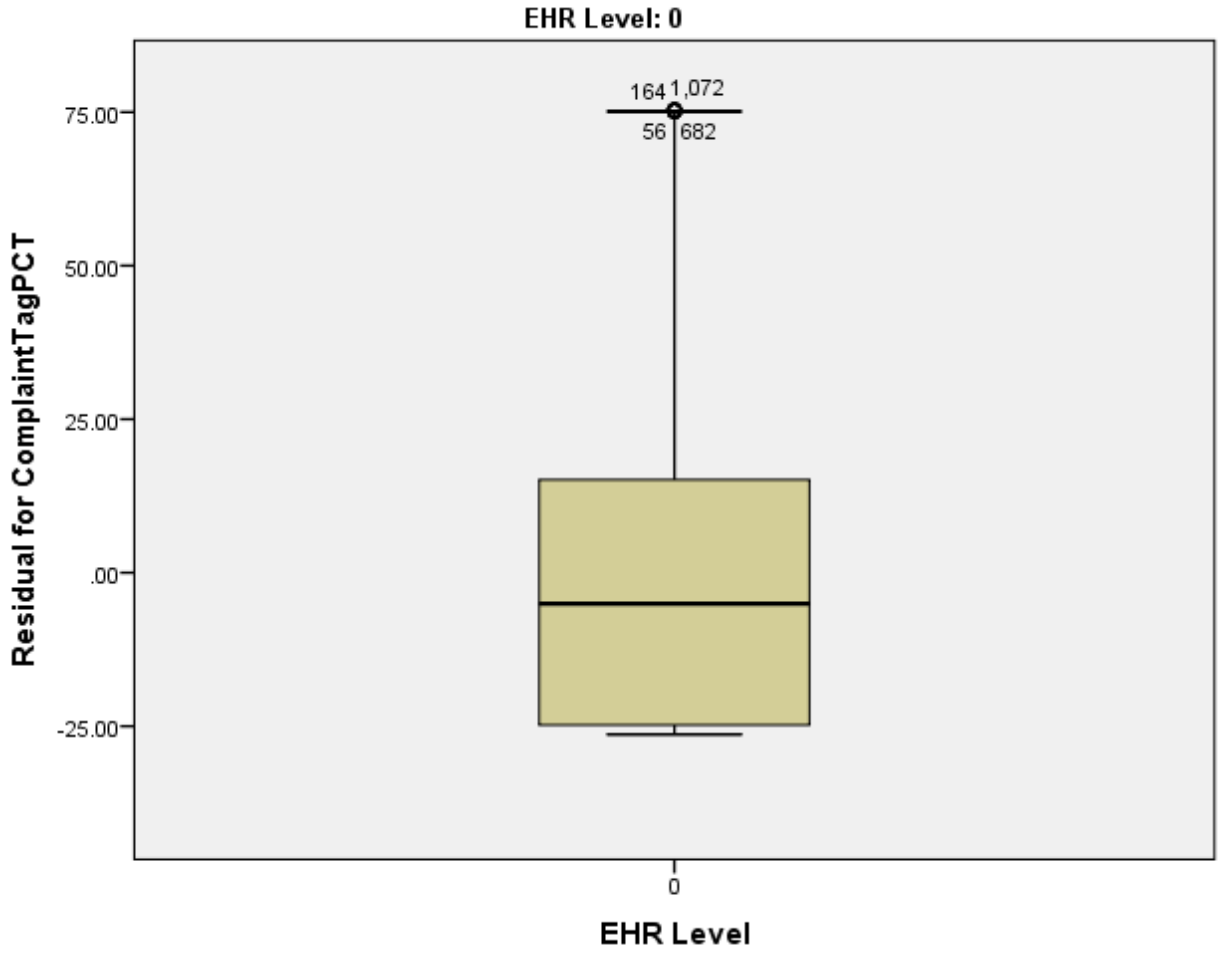
Detrended Normal Q-Q Plots

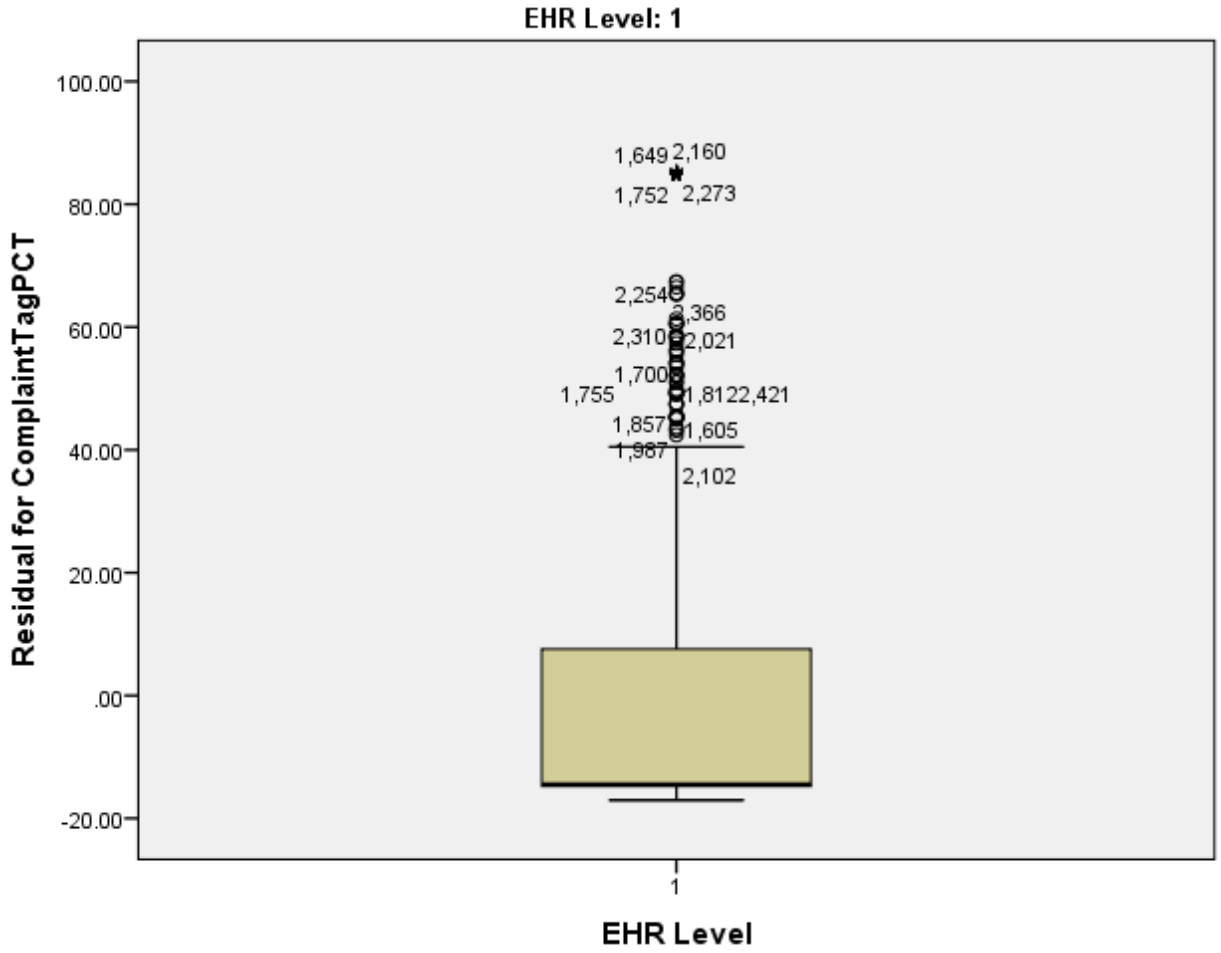

Detrended Normal Q-Q Plot of Residual for ComplaintTagPCT
EHR Level= 0. for EHR= 0
Dev from Normal
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-25
0
25
50
75
Observed Value

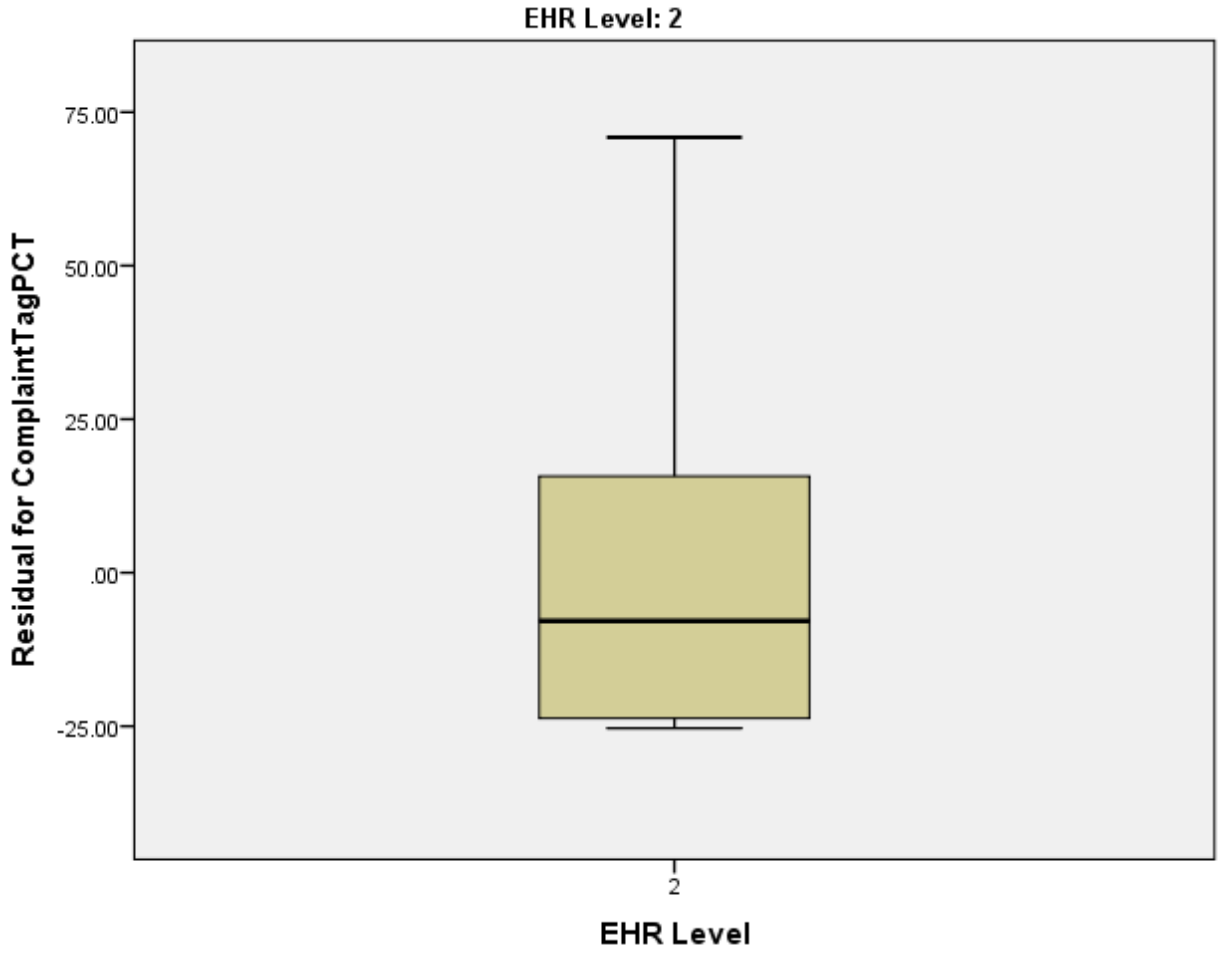

Detrended Normal Q-Q Plot of Residual for ComplaintTagPCT
EHR Level= 1. for EHR= 1
Dev from Normal
3
2
1
0
-1
-20
0
20
40
60
80
100
Observed Value


Detrended Normal Q-Q Plot of Residual for ComplaintTagPCT
EHR Level= 2. for EHR= 2
Dev from Normal
2.0
1.5
1.0
0.5
0.0
-0.5
-25
0
25
50
75
Observed Value

Boxplots

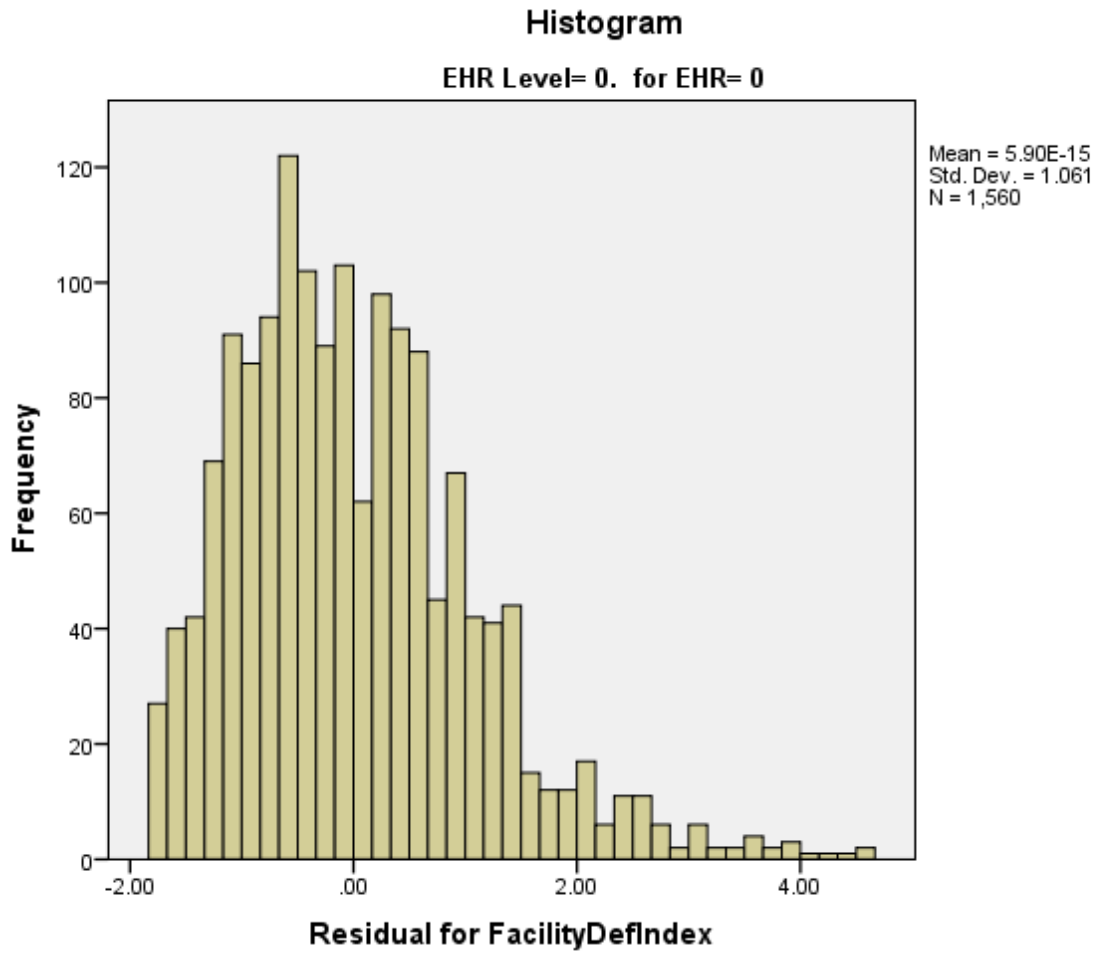

EHR Level: 0
164 1,072
56 682
75.00
50.00
25.00
.00
-25.00
Residual for ComplaintTagPCT
0
EHR Level

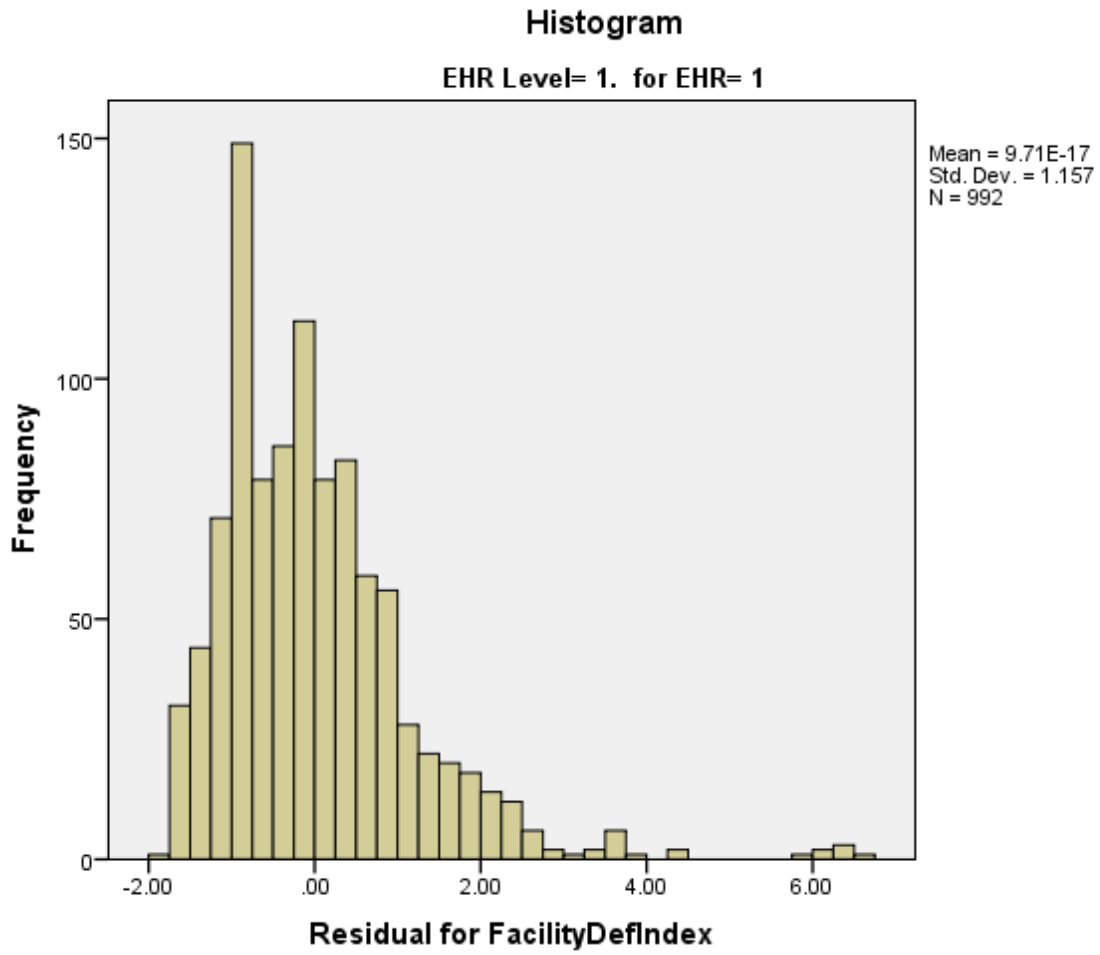

EHR Level: 1
Residual for ComplaintTagPCT
100.00
80.00
60.00
40.00
20.00
.00
-20.00
1,649
2,160
1,752
2,273
2,254
2,366
2,310
2,021
1,700
1,755
1,812
2,421
1,857
1,605
1,987
2,102
1
EHR Level

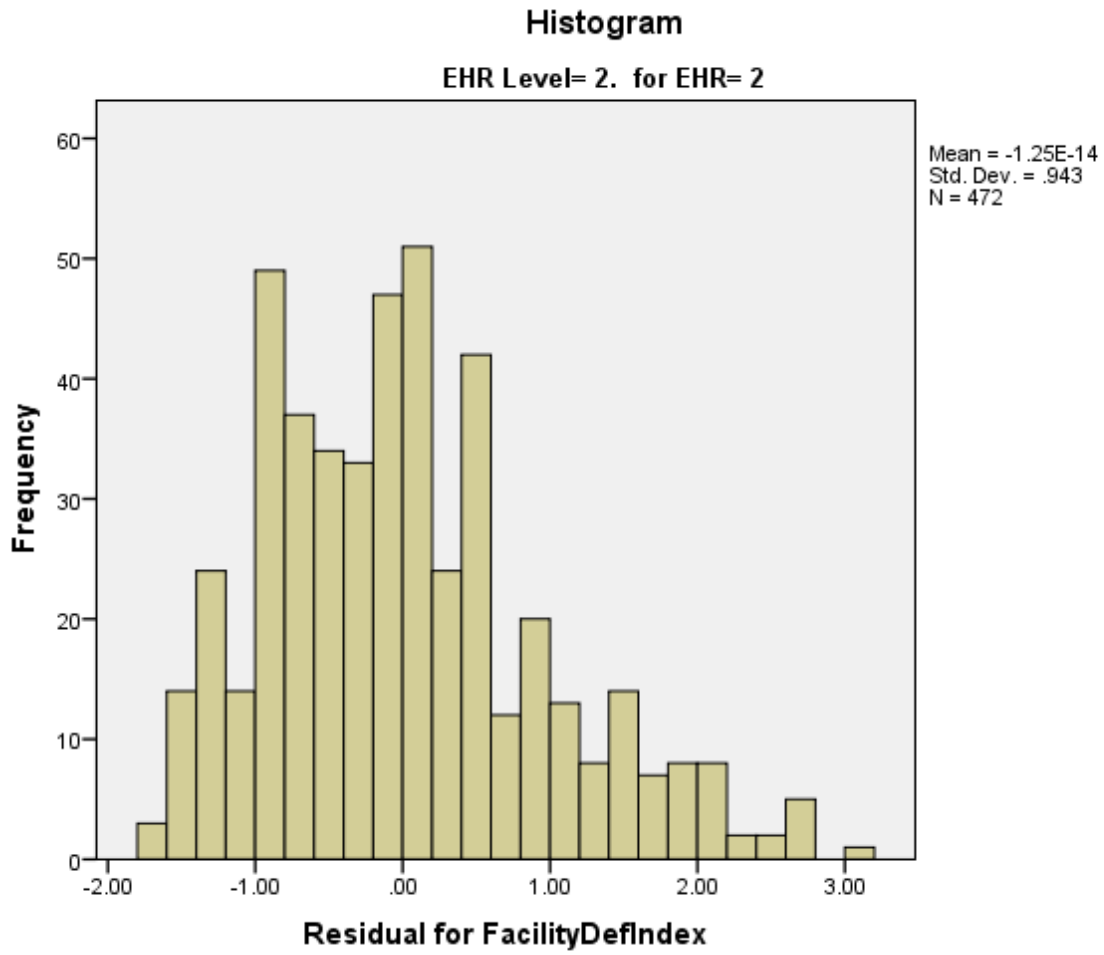


Residual for FacilityDefIndex

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 5.90E-15
Std. Dev. = 1.061
N = 1,560
Frequency
120
100
80
60
40
20
0
-2.00
.00
2.00
4.00
Residual for FacilityDefIndex


Histogram
EHR Level= 1. for EHR= 1
Mean = 9.71E-17
Std. Dev. = 1.157
N = 992
Frequency
150
100
50
0
-2.00
.00
2.00
4.00
6.00
Residual for FacilityDefIndex



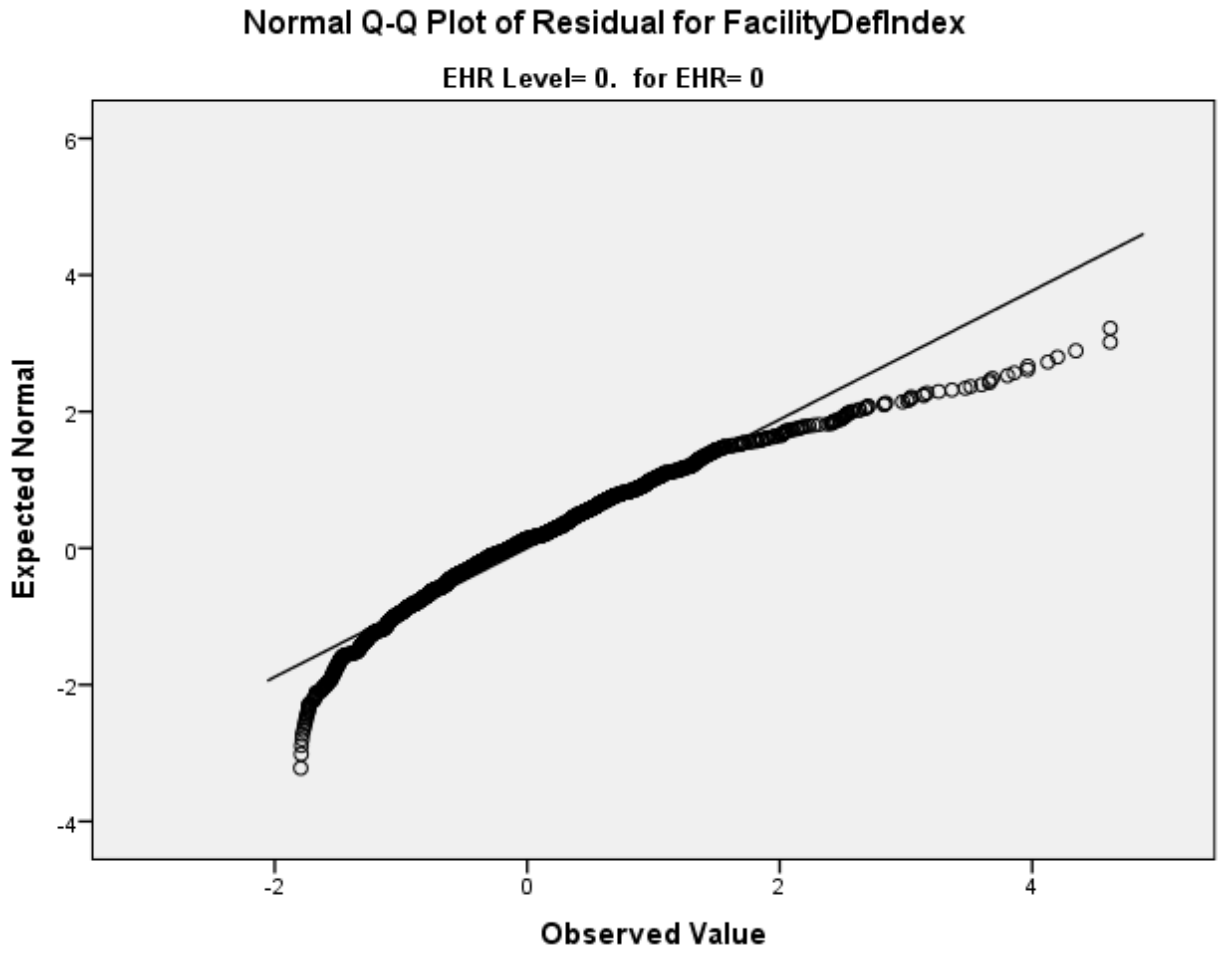
Stem-and-Leaf Plots

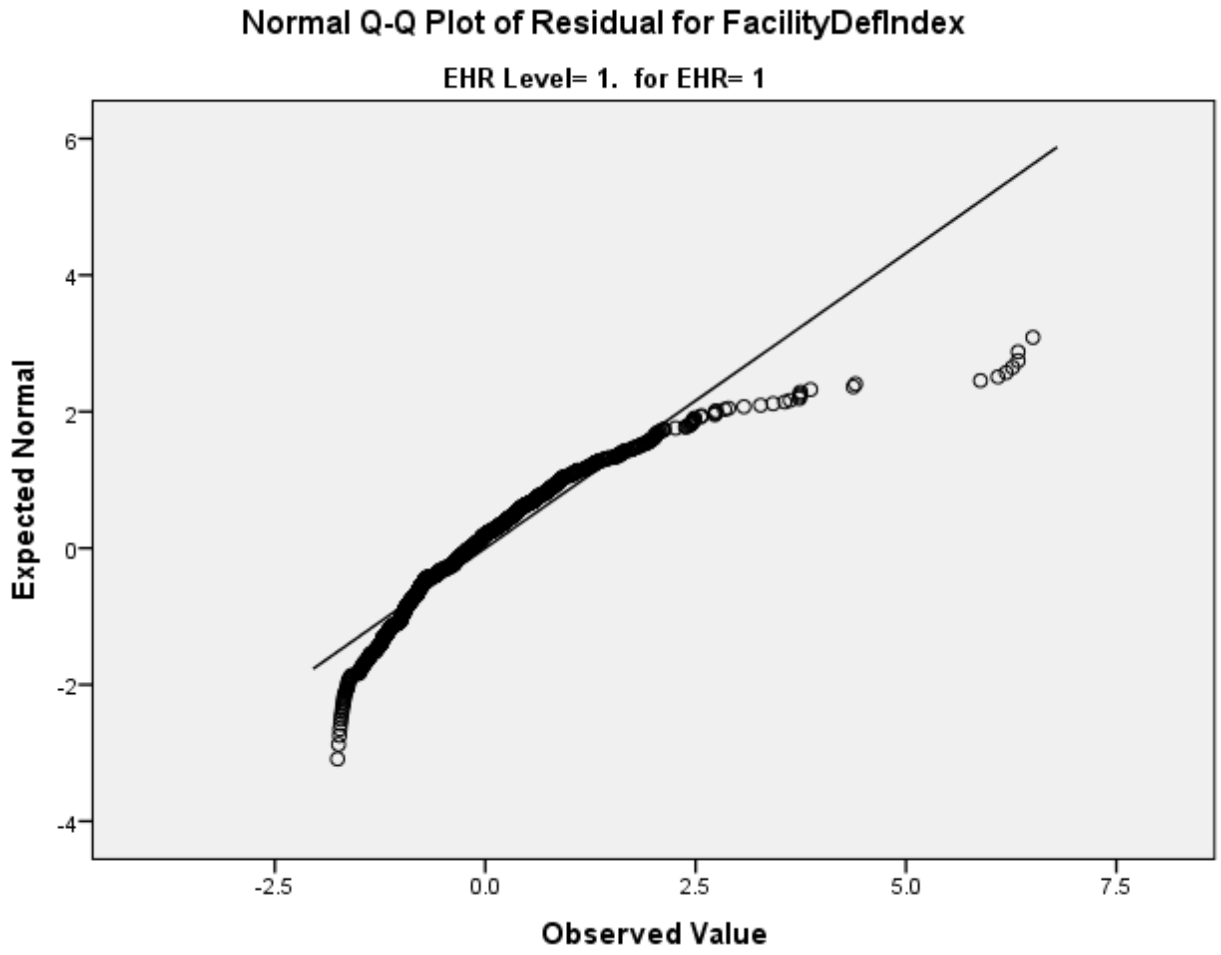
```
Residual for FacilityDefIndex Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

    34.00       -1 .  6666666777777777
    61.00       -1 .  44444444444445555555555555555
    77.00       -1 .  22222222222222222222233333333333333333
    97.00       -1 .  00000000000000000000000000011111111111111111111
   107.00       -0 .
```

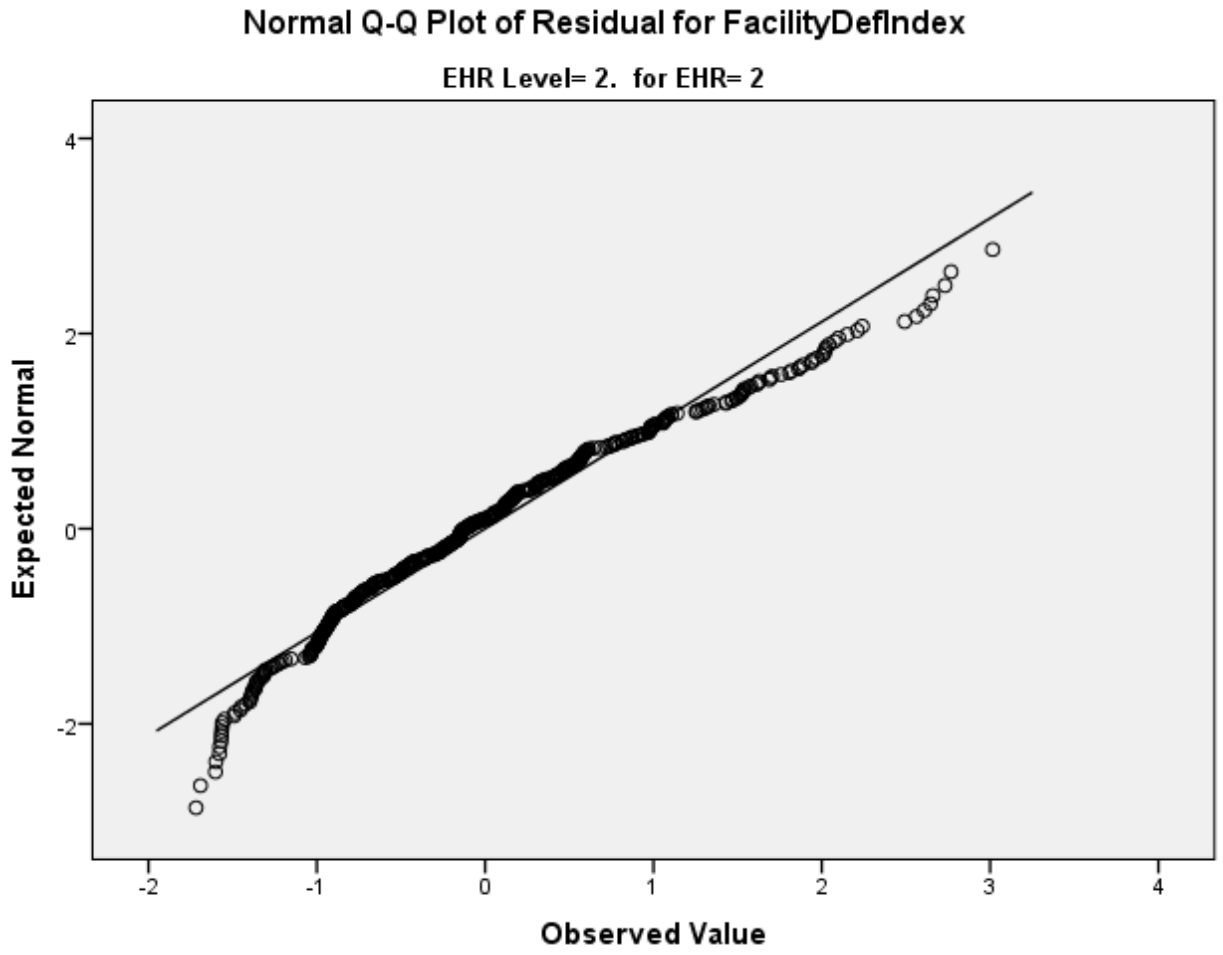
```
88888888888888888888888899999999999999999999999999
   140.00       -0 .
66666666666666666666666666666666666666777777777777777777777777777
   120.00       -0 .
44444444444444444444444444444455555555555555555555555555
   110.00       -0 .
22222222222222222223333333333333333333333333333333333
   119.00       -0 .
00000000000000000000000000011111111111111111111111111111
    80.00        0 .  00000000000000011111111111111111111111
   127.00        0 .
22222222222222222222222222223333333333333333333333333333333333
   101.00        0 .
44444444444444444444455555555555555555555555555555
    68.00        0 .  66666666666666666666677777777777
    76.00        0 .  88888888888888899999999999999999999
    46.00        1 .  00000000000000000111111
    58.00        1 .  22222222233333333333333333
    34.00        1 .  4444444444455555
    14.00        1 .  6666777
    14.00        1 .  8888999
    19.00        2 .  000000111
     5.00        2 .  23
    19.00        2 .  444445555
     2.00        2 .  6
    32.00 Extremes    (>=2.7)

 Stem width:      1.00
 Each leaf:        2 case(s)




Residual for FacilityDefIndex Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

    33.00       -1 .  56666666777
   115.00       -1 .  00000001111111111222222222233333444444
   228.00       -0 .
55555555555566666777777777777777777778888888888888888999999999999999999
99999
   198.00       -0 .
00000000000000011111111111111222222222222233333333333333333444444444
   162.00        0 .
00000000011111111111222222222222333333333333333444444444
   115.00        0 .  55555556666666677777777788888888889999
    50.00        1 .  00000112222233344
    38.00        1 .  555667788999
    26.00        2 .  000013444&
     1.00        2 .  &
    26.00 Extremes    (>=2.6)
```

```
 Stem width:      1.00
 Each leaf:        3 case(s)


 & denotes fractional leaves.



Residual for FacilityDefIndex Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

    12.00       -1 .  55556&
    43.00       -1 .  000000122233333333344
   100.00       -0 .  555555566666667777777777888888899999999999999999
   100.00       -0 .  000000001111111111111122222222233333344444444444
    94.00        0 .  00000000111111111111111122223333333344444444
    55.00        0 .  555555555566777888999999
    27.00        1 .  0000012233444
    23.00        1 .  5555667889
    10.00        2 .  00012
     8.00 Extremes    (>=2.5)

 Stem width:      1.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.
```

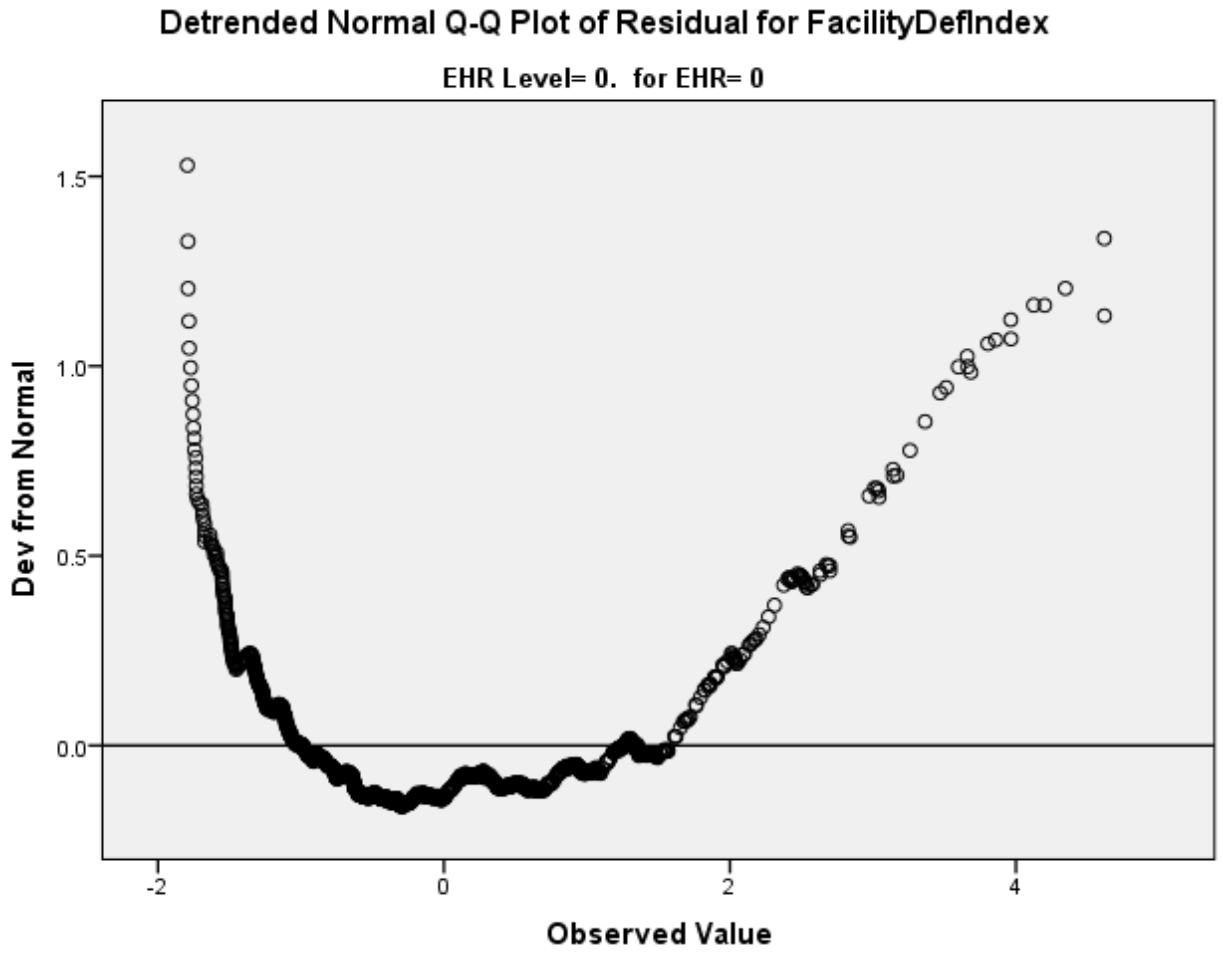
Normal Q-Q Plots

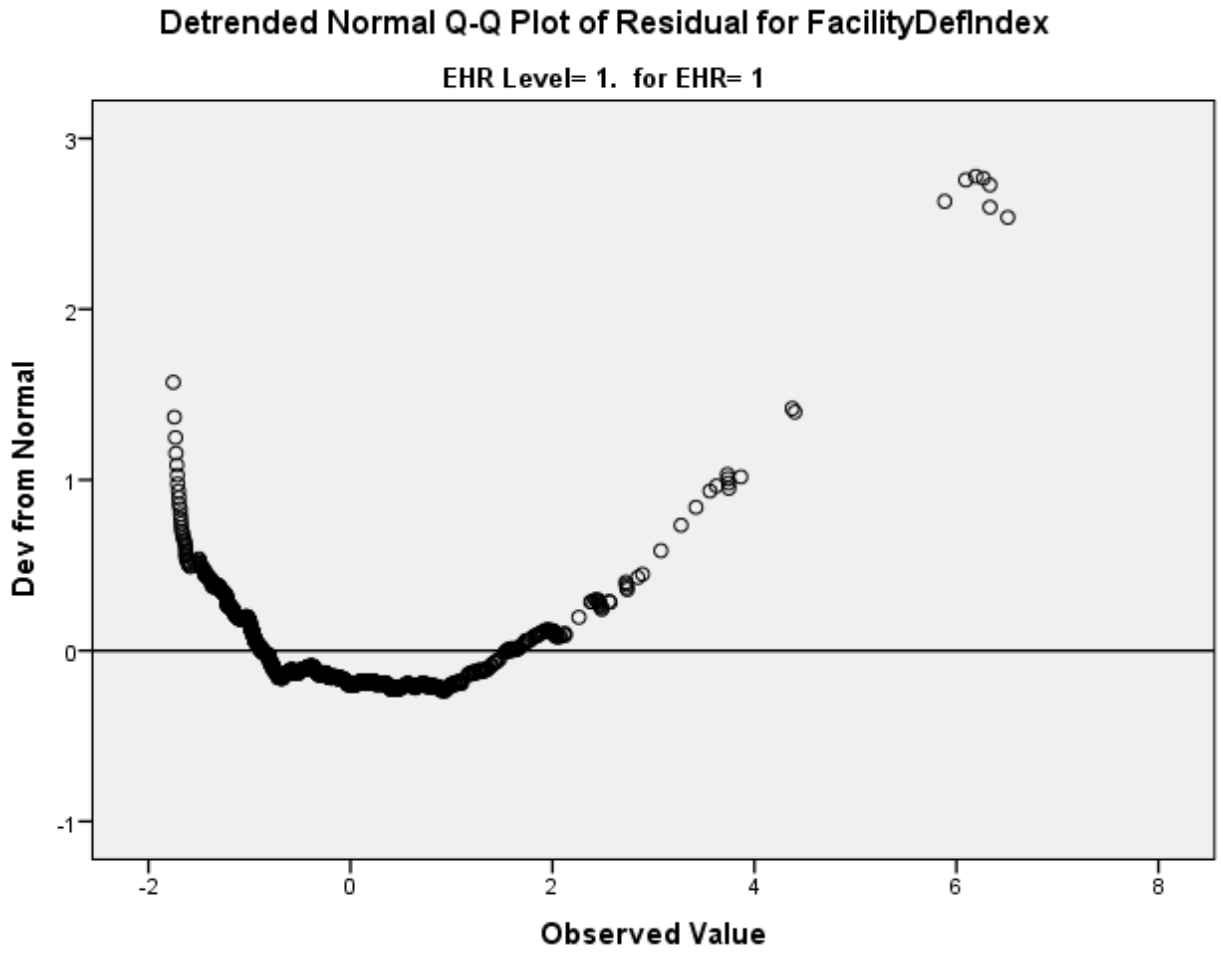

Normal Q-Q Plot of Residual for FacilityDefIndex
EHR Level= 0. for EHR= 0
Expected Normal
Observed Value
6
4
2
0
-2
-4
-2
0
2
4

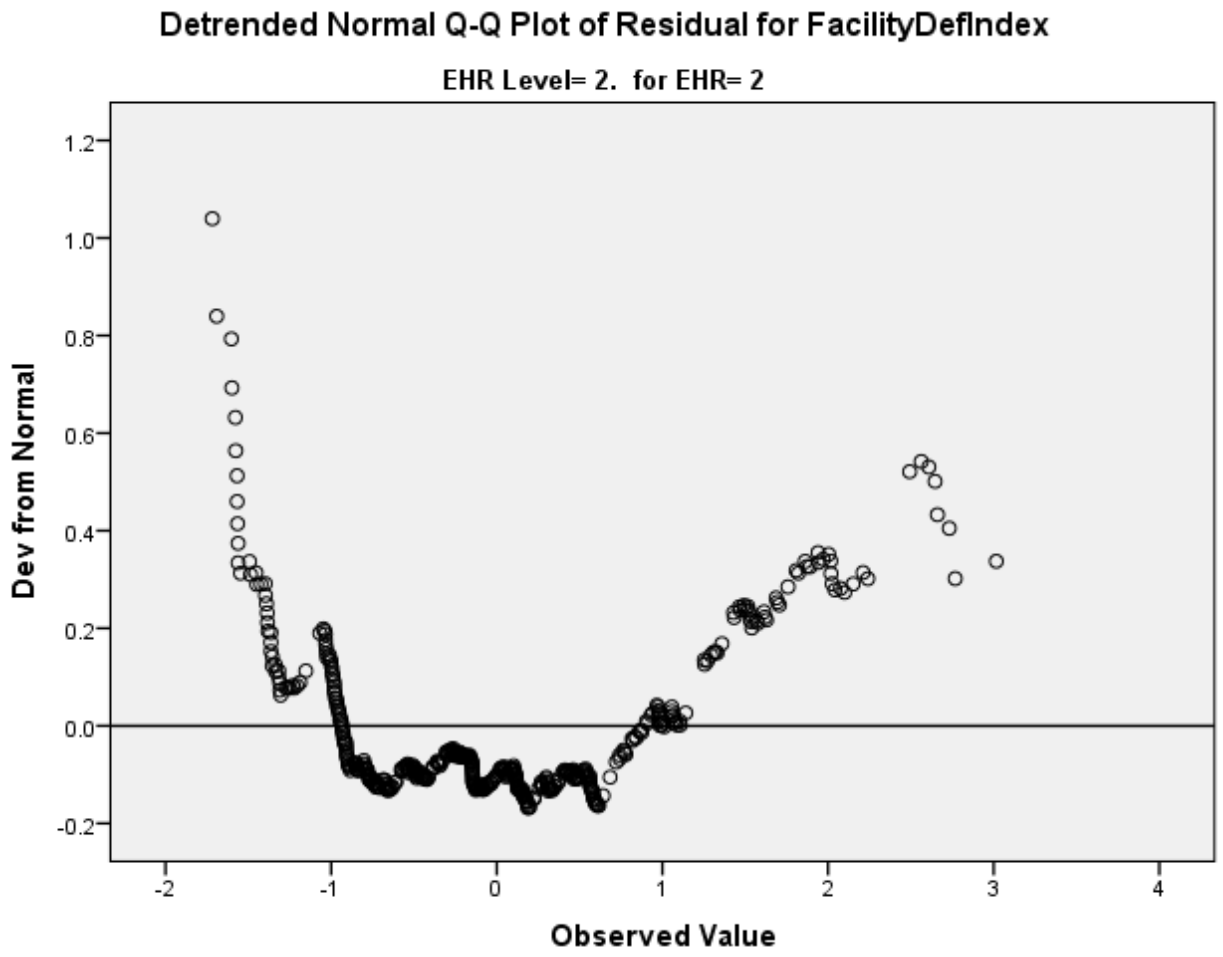

Normal Q-Q Plot of Residual for FacilityDefIndex
EHR Level= 1. for EHR= 1
Expected Normal
6
4
2
0
-2
-4
-2.5
0.0
2.5
5.0
7.5
Observed Value



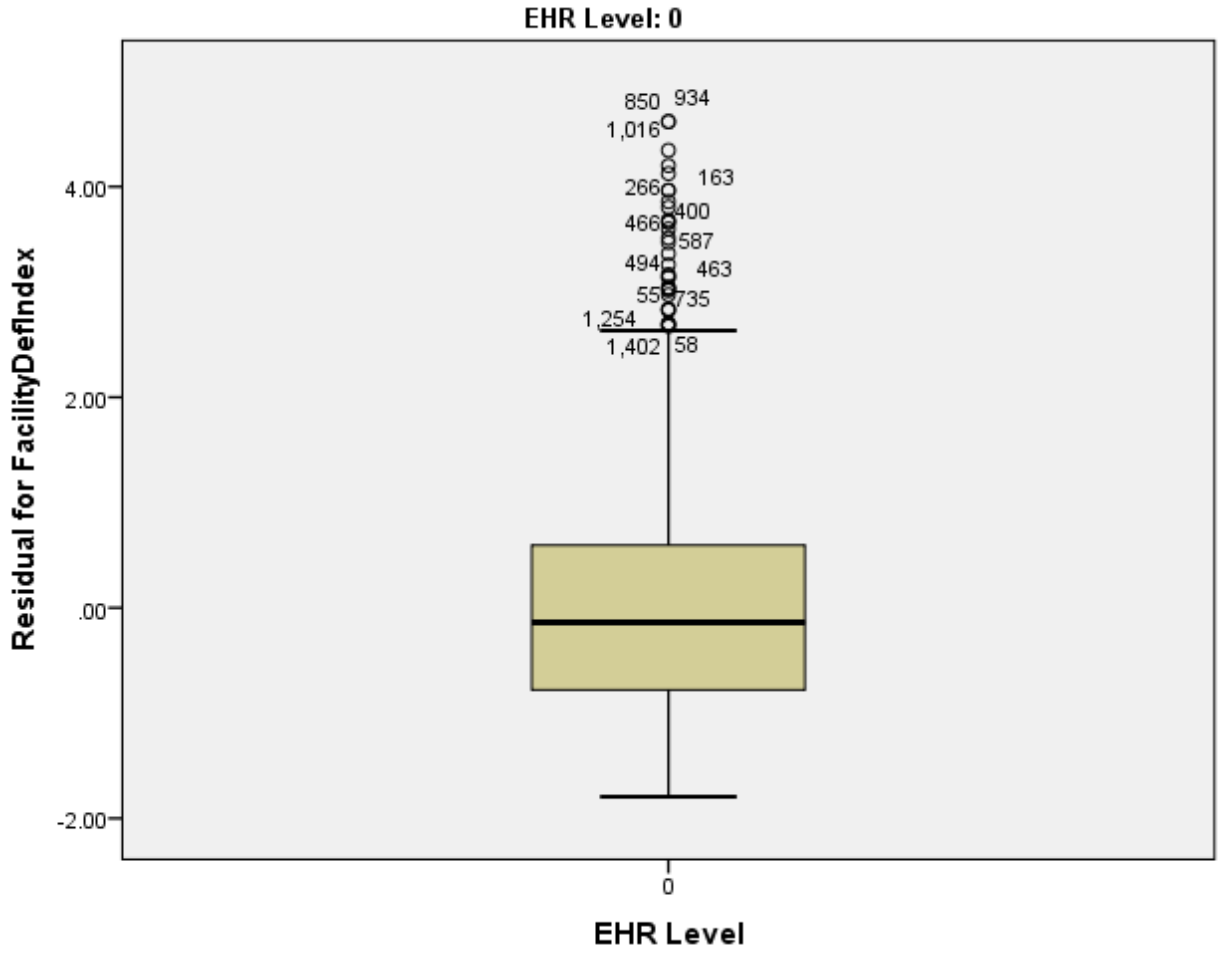
Detrended Normal Q-Q Plots

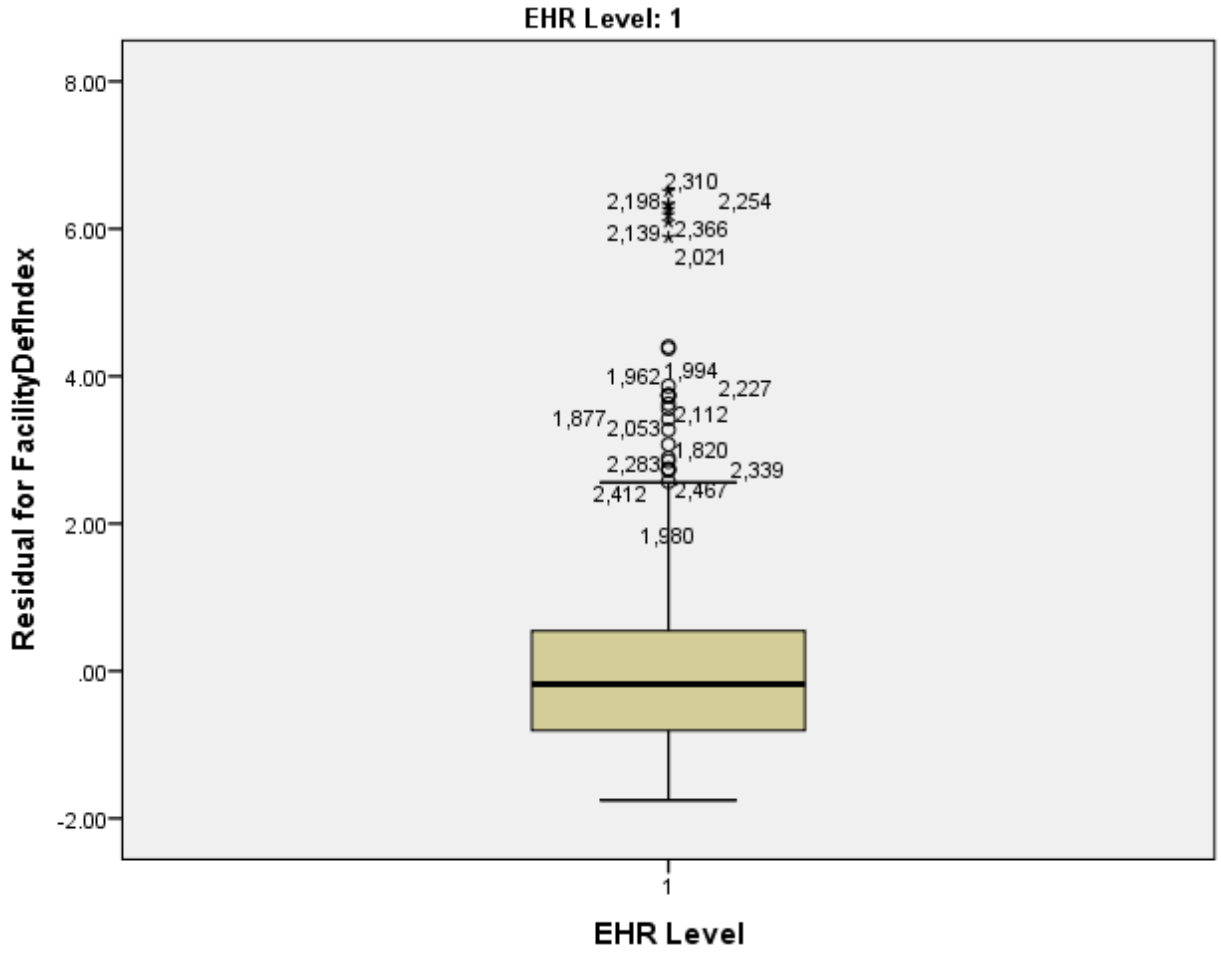

Detrended Normal Q-Q Plot of Residual for FacilityDefIndex
EHR Level= 0. for EHR= 0
Dev from Normal
1.5
1.0
0.5
0.0
-2
0
2
4
Observed Value

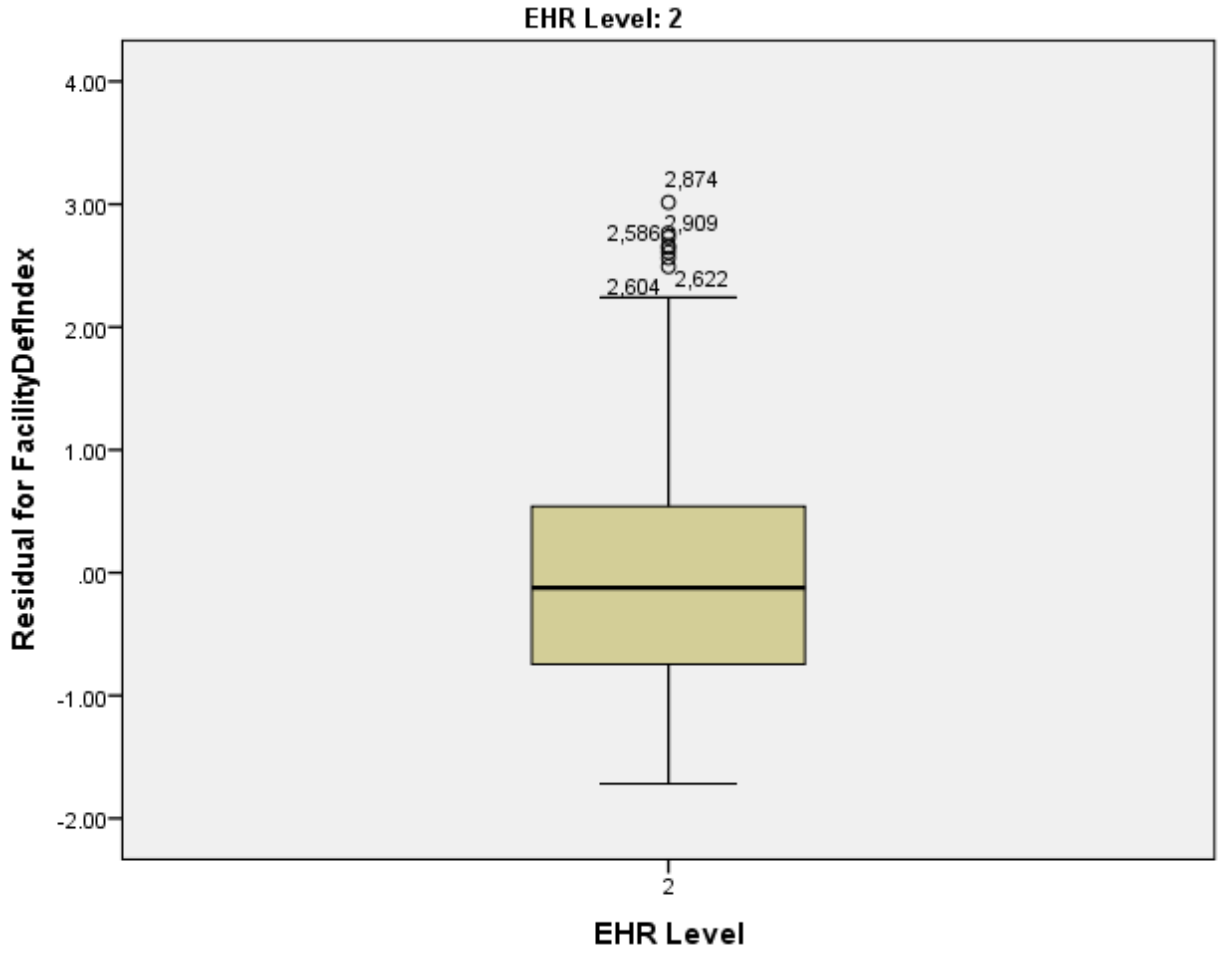

Detrended Normal Q-Q Plot of Residual for FacilityDefIndex
EHR Level= 1. for EHR= 1
Dev from Normal
3
2
1
0
-1
-2
0
2
4
6
8
Observed Value


Detrended Normal Q-Q Plot of Residual for FacilityDefIndex
EHR Level= 2. for EHR= 2
Dev from Normal
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-2
-1
0
1
2
3
4
Observed Value

Boxplots

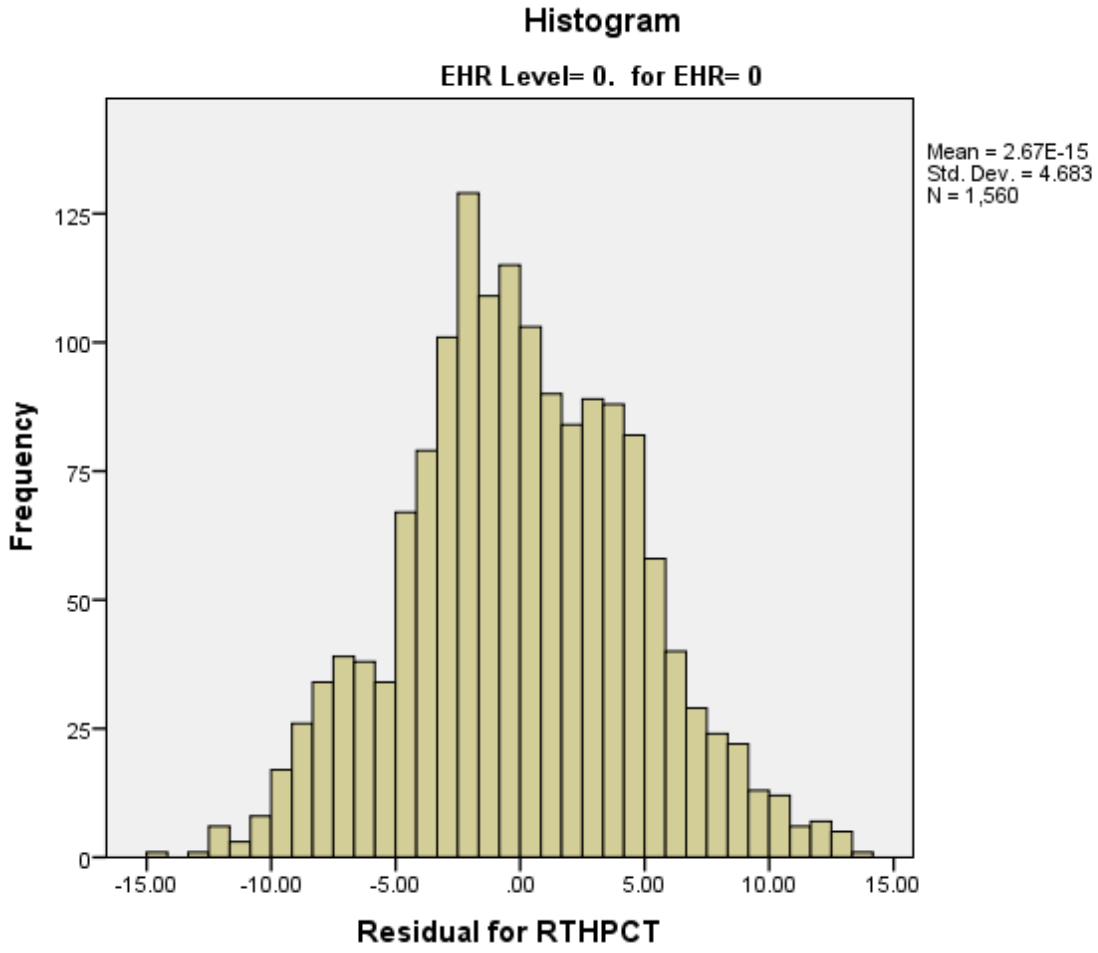

EHR Level: 0
Residual for FacilityDefIndex
4.00
2.00
.00
-2.00
850
934
1,016
163
266
400
466
587
494
463
735
1,254
1,402
58
0
EHR Level

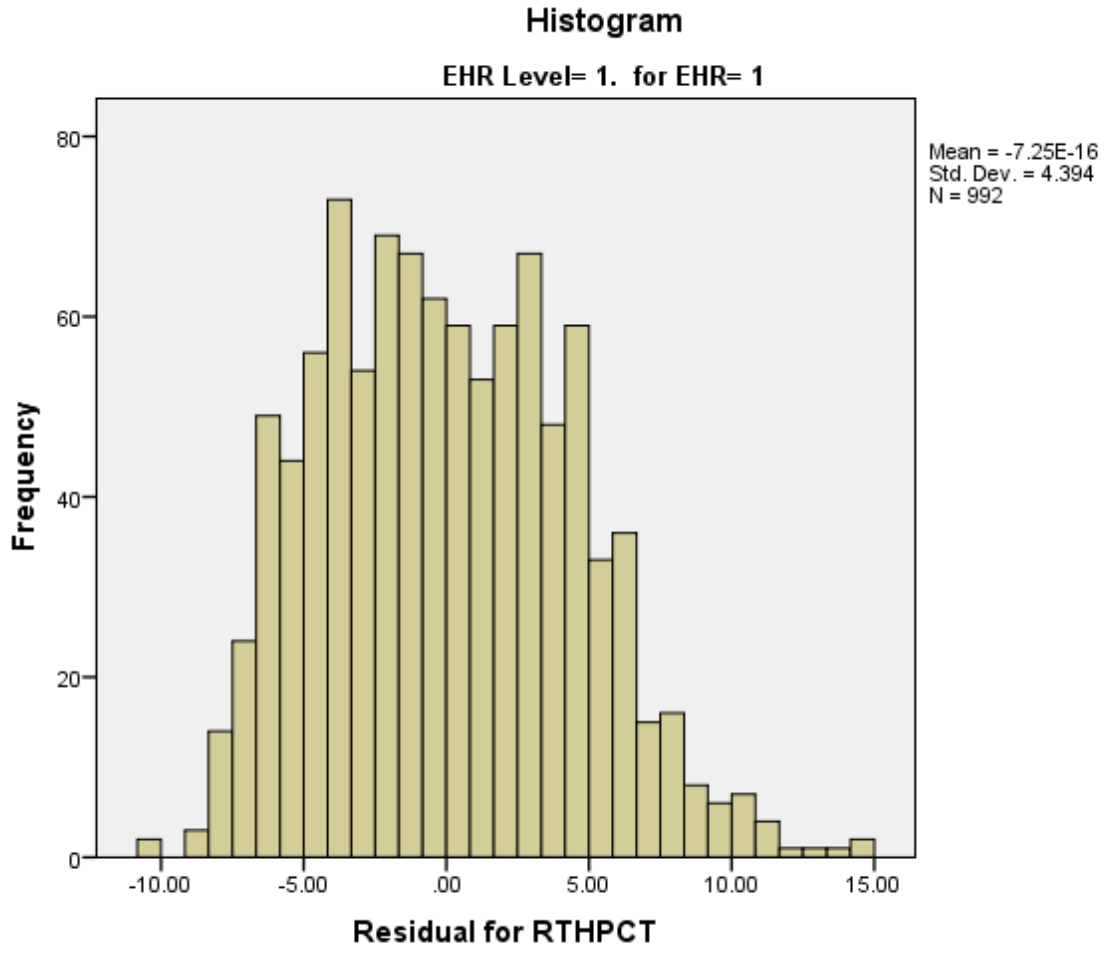

EHR Level: 1
Residual for FacilityDefIndex
8.00
6.00
4.00
2.00
.00
-2.00
2,310
2,198
2,254
2,139
2,366
2,021
1,962
1,994
2,227
1,877
2,053
2,112
1,820
2,283
2,339
2,412
2,467
1,980
1
EHR Level

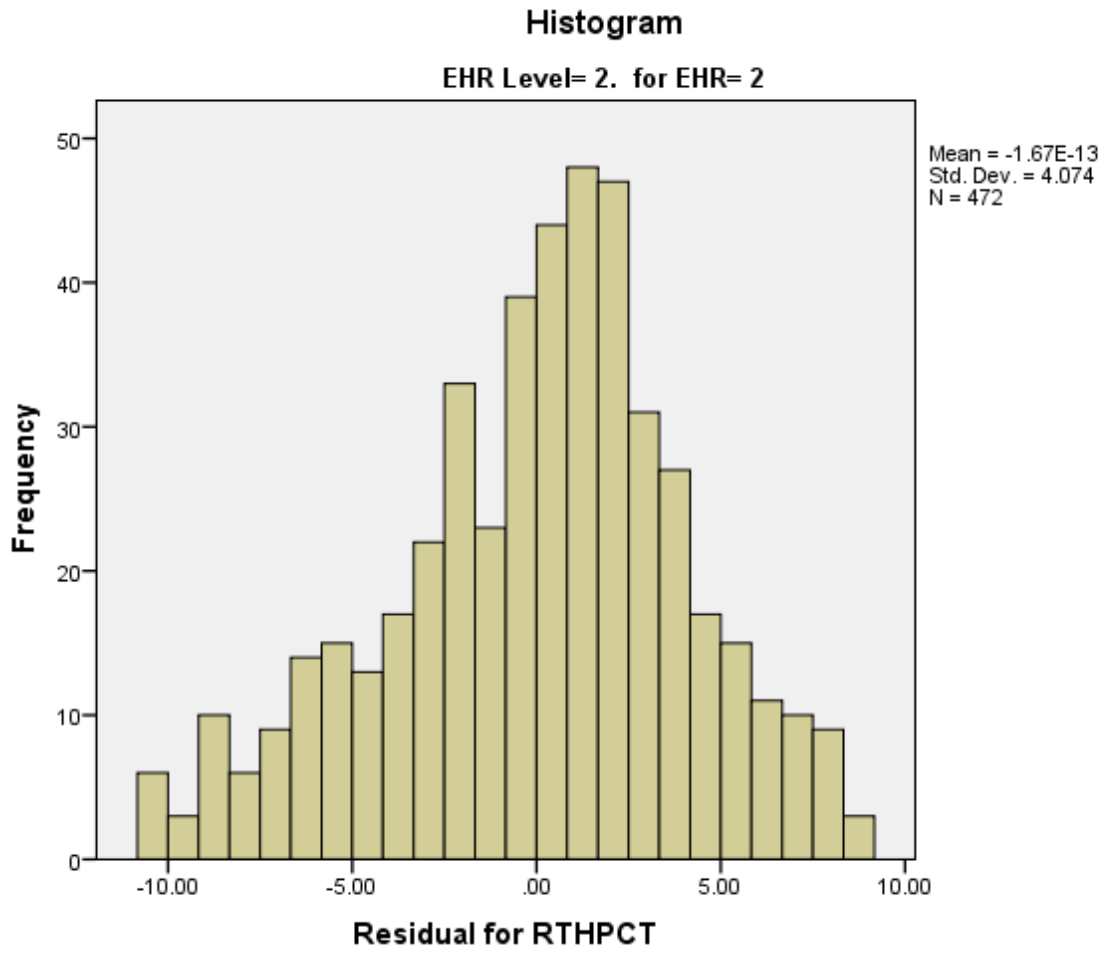


Residual for RTHPCT

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 2.67E-15
Std. Dev. = 4.683
N = 1,560
Frequency
125
100
75
50
25
0
-15.00
-10.00
-5.00
.00
5.00
10.00
15.00
Residual for RTHPCT


Histogram
EHR Level= 1. for EHR= 1
Mean = -7.25E-16
Std. Dev. = 4.394
N = 992
Frequency
80
60
40
20
0
-10.00
-5.00
.00
5.00
10.00
15.00
Residual for RTHPCT



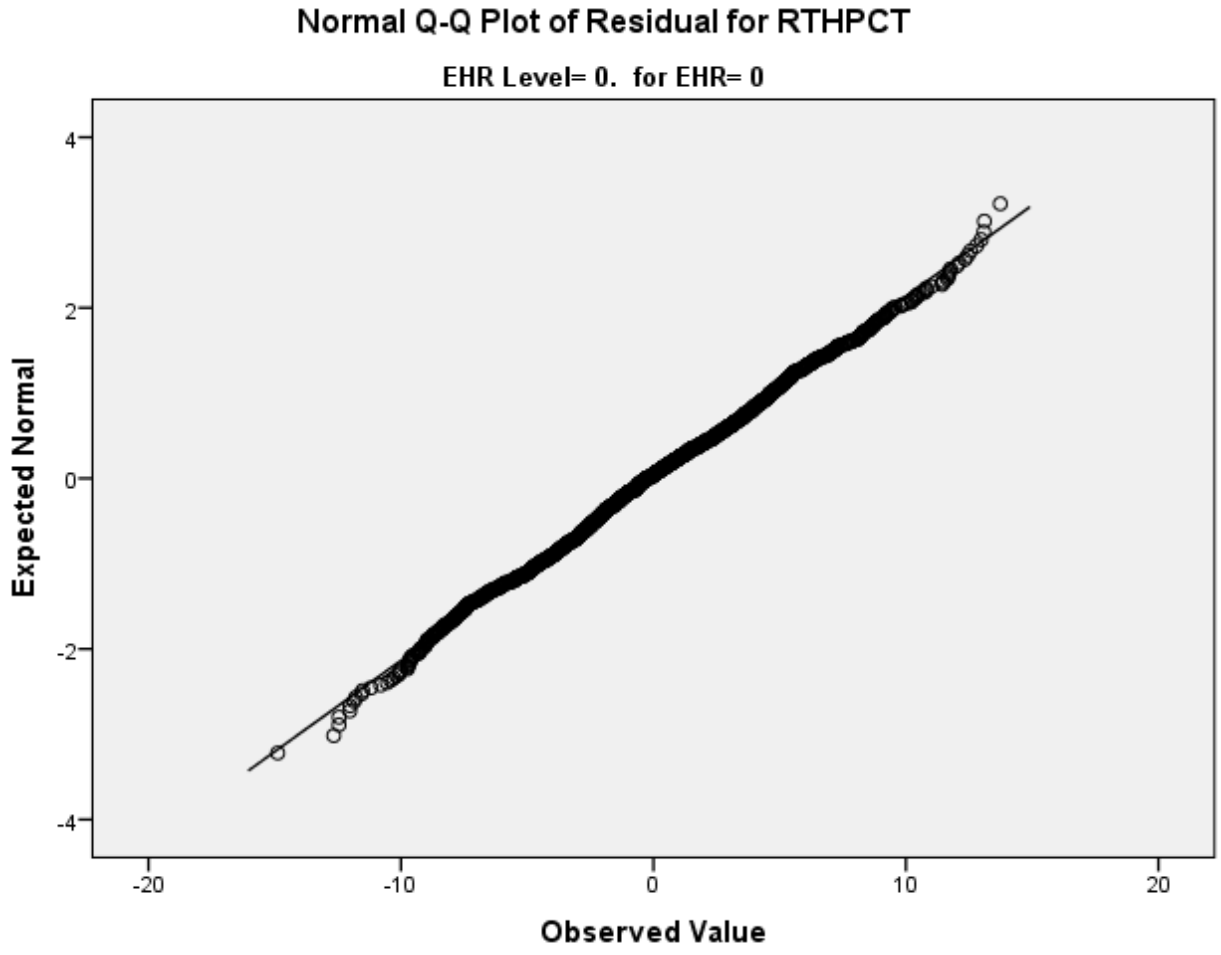
Stem-and-Leaf Plots

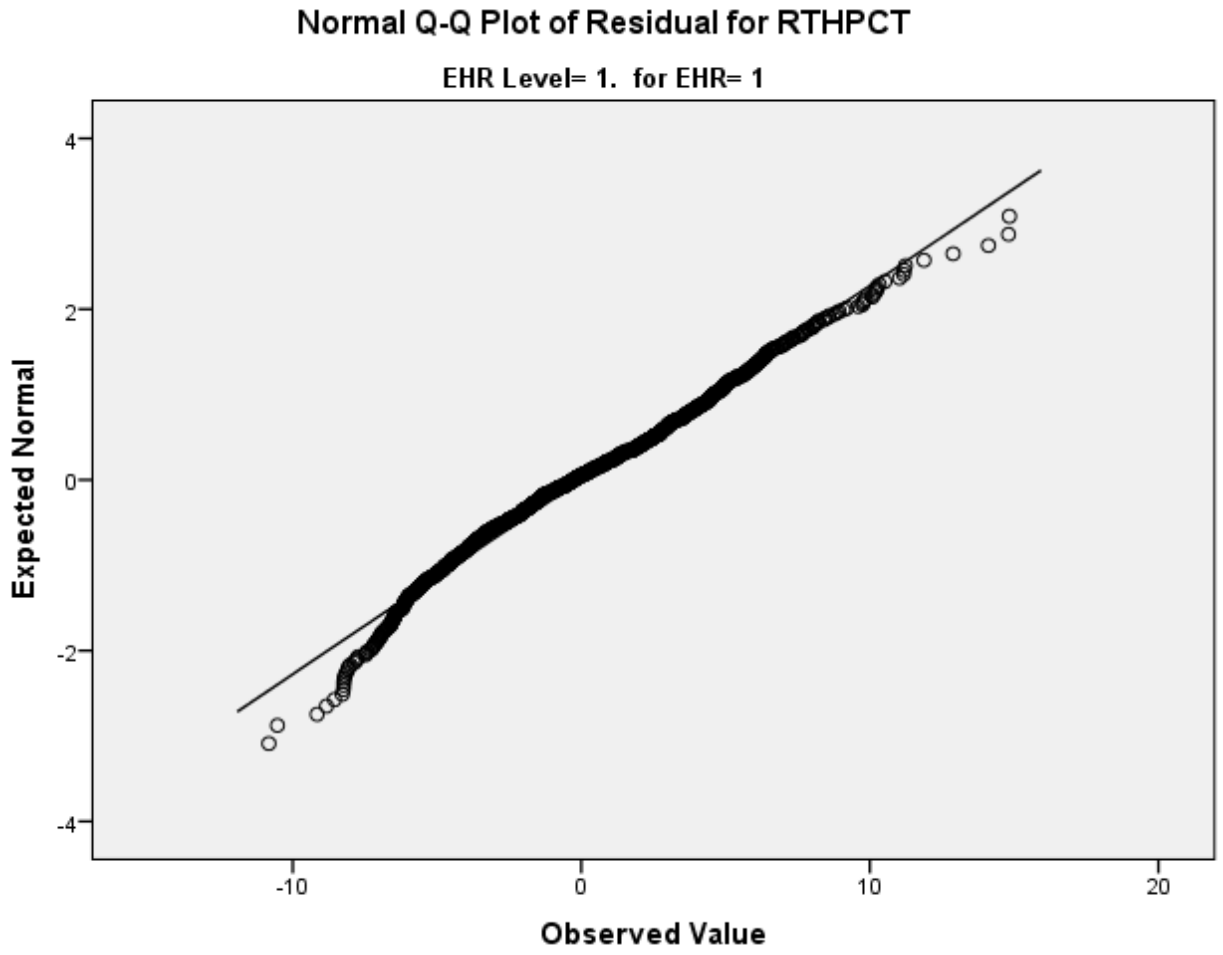
```
Residual for RTHPCT Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     4.00 Extremes    (=<-12.5)
     2.00      -12 .  0
     5.00      -11 .  5&
     8.00      -10 .  0&&
    22.00       -9 .  0022356667&
```

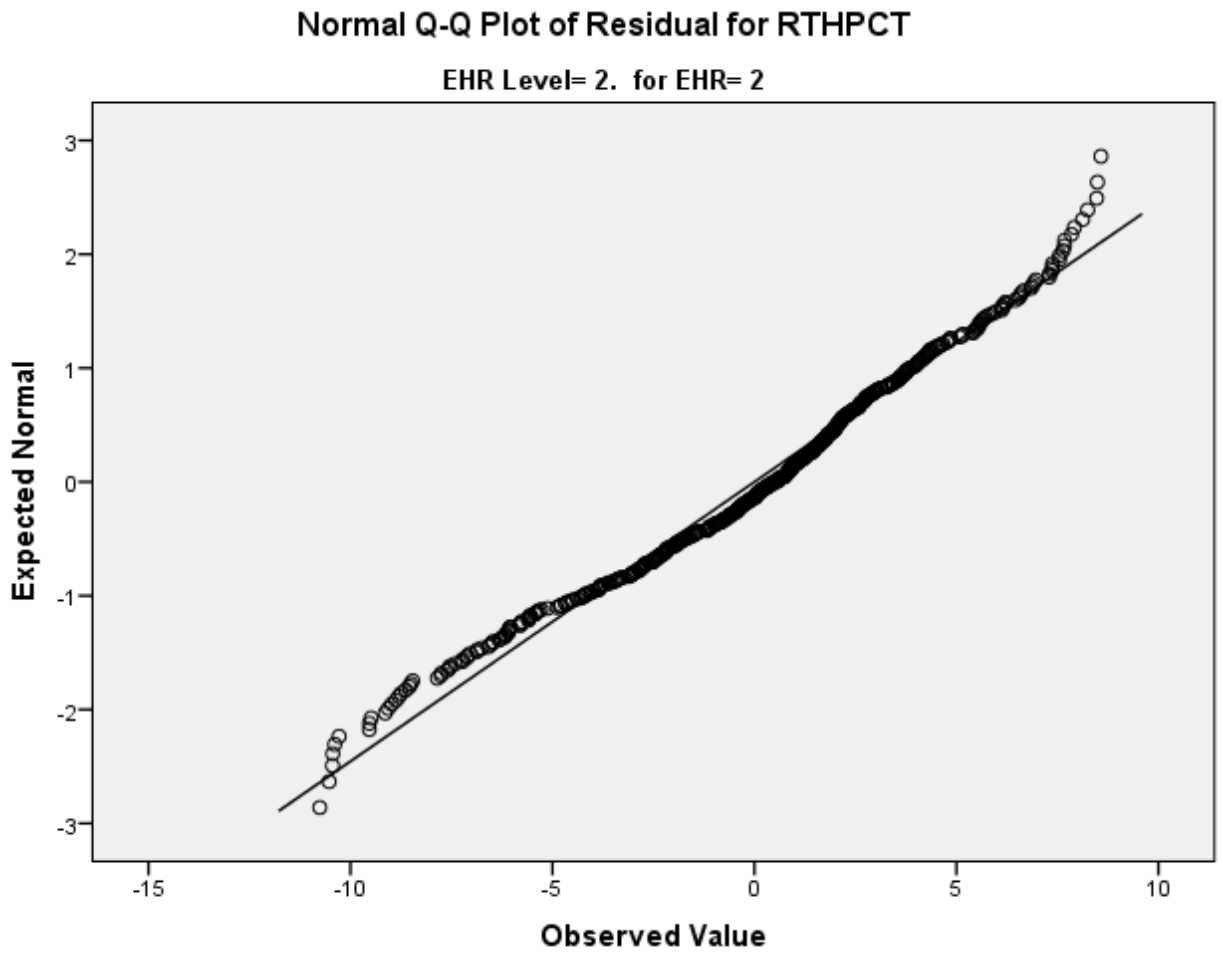
```
    32.00       -8 .  00123334567799&
    46.00       -7 .  01123344445566778889
    43.00       -6 .  001123444566678899
    45.00       -5 .  011123444456688999
    78.00       -4 .  000011122233344455555667777888889999
    97.00       -3 .  0000011112222234444444555566666677778888899999
   151.00       -2 .
000000000111111222222223333334444444455555566666666677778888888999999999
99
   143.00       -1 .
00000001111112222222333333334444444455555555666777777888888999999999
   131.00       -0 .
0000000111222223333334444444455555555666666666667777777899999
   124.00        0 .
000000111111222223333333344445555556666777777788889999999
   103.00        1 .  00000011122222233333334444444556666777888888899999
   104.00        2 .
0000011111222333344444445555555666667778888888899999
   106.00        3 .
000111111112222333334444555555566666677888889999999
    99.00        4 .  00000011122222333334445555555566667777788899999
    68.00        5 .  0000011222222334444455556889998&
    39.00        6 .  0001122334466799&
    29.00        7 .  00012224668&
    34.00        8 .  01122335567789&
    16.00        9 .  12234&&
    12.00       10 .  247&&
     9.00       11 .  467&
     5.00       12 .  &&
     5.00 Extremes    (>=12.8)

 Stem width:      1.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.



Residual for RTHPCT Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     2.00       -1 .  0
    13.00       -0 .  888888&
    67.00       -0 .  666666666666666666666666677777777
   122.00       -0 .
444444444444444444444444444444445555555555555555555555555555
   154.00       -0 .
222222222222222222222222222222223333333333333333333333333333333333333333
333333
   159.00       -0 .
```

```
00000000000000000000000000000000000011111111111111111111111111111111
11111111
   133.00        0 .
00000000000000000000000000000000000011111111111111111111111111111111
   147.00        0 .
22222222222222222222222222222222222233333333333333333333333333333333
33
   105.00        0 .
44444444444444444444444444444445555555555555555555
    53.00        0 .  66666666666666666777777777
    21.00        0 .  8888888999
    12.00        1 .  00011
     1.00        1 .  &
     3.00 Extremes    (>=14)

 Stem width:     10.00
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for RTHPCT Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     6.00 Extremes    (=<-10.3)
     5.00       -9 .  01455
     8.00       -8 .  45567889
    12.00       -7 .  001224556778
    17.00       -6 .  00000111234455788
    15.00       -5 .  123344555557778
    16.00       -4 .  0011122345666788
    21.00       -3 .  000012334445677888889
    35.00       -2 .  00111111222233333444556777777888899
    31.00       -1 .  0011111113444445566677788999999
    44.00       -0 .  000011112222333333444444555566666777788899999
    56.00        0 .
00000000011111222333334444555556667777778888888899999999
    58.00        1 .
00001111222222233334444444555555666666777777888888999999999
    48.00        2 .  000000111111112222333344455555666666777778888999
    29.00        3 .  00112233444555566667777888999
    23.00        4 .  000011222223334456677888
    17.00        5 .  01144455555667789
    14.00        6 .  11122455668899
    12.00        7 .  233335566689
     5.00        8 .  12445

 Stem width:      1.00
 Each leaf:        1 case(s)
```

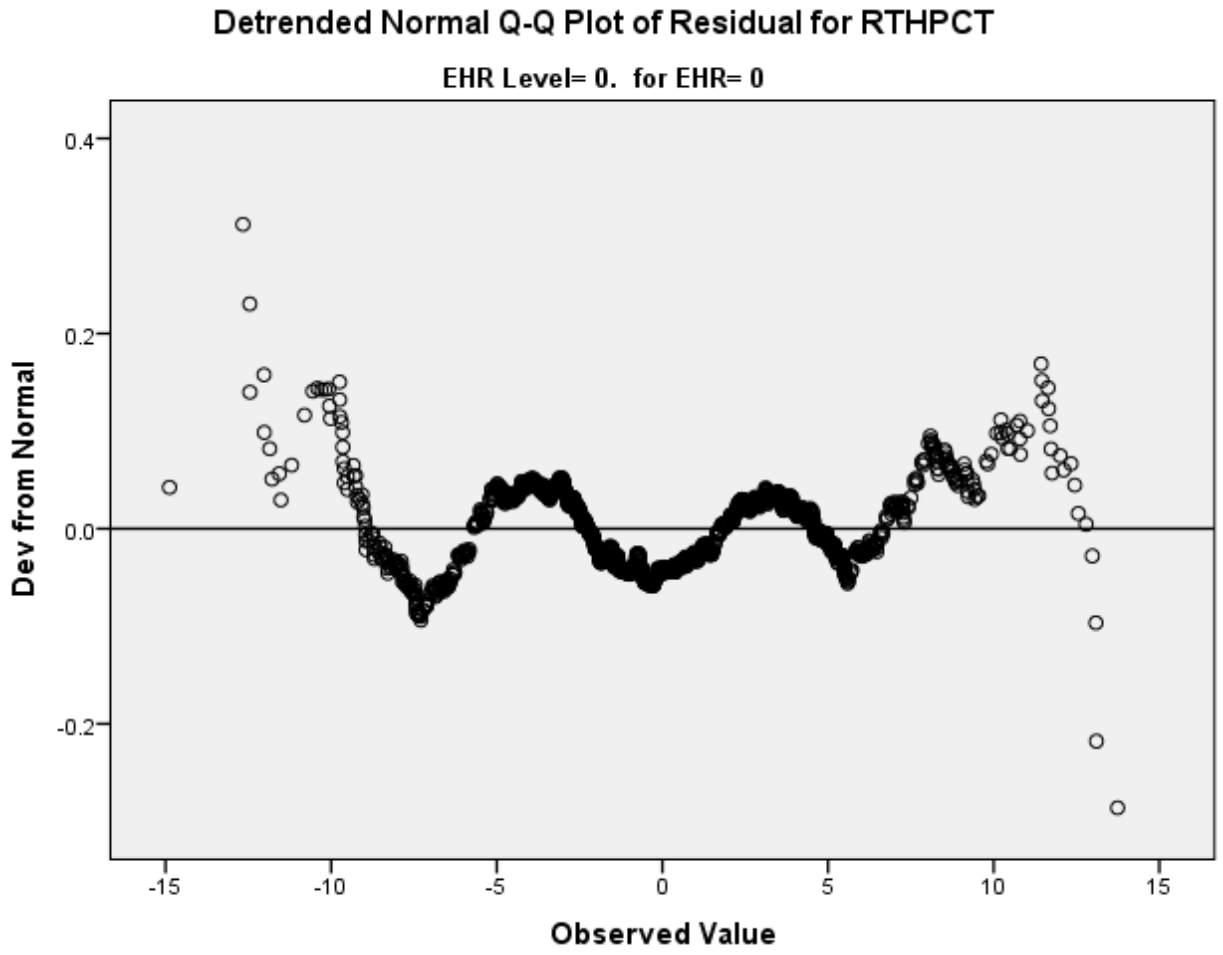
Normal Q-Q Plots

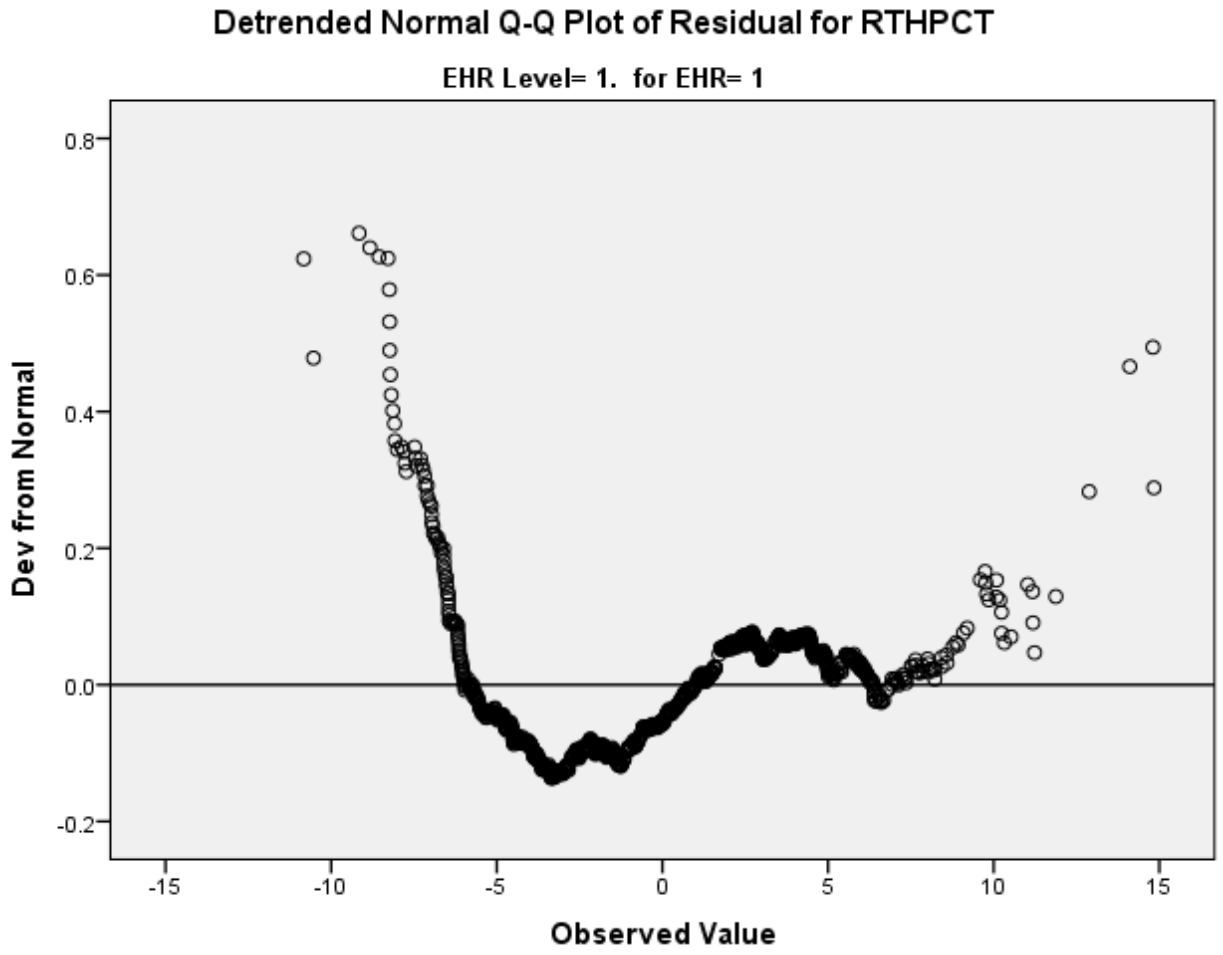


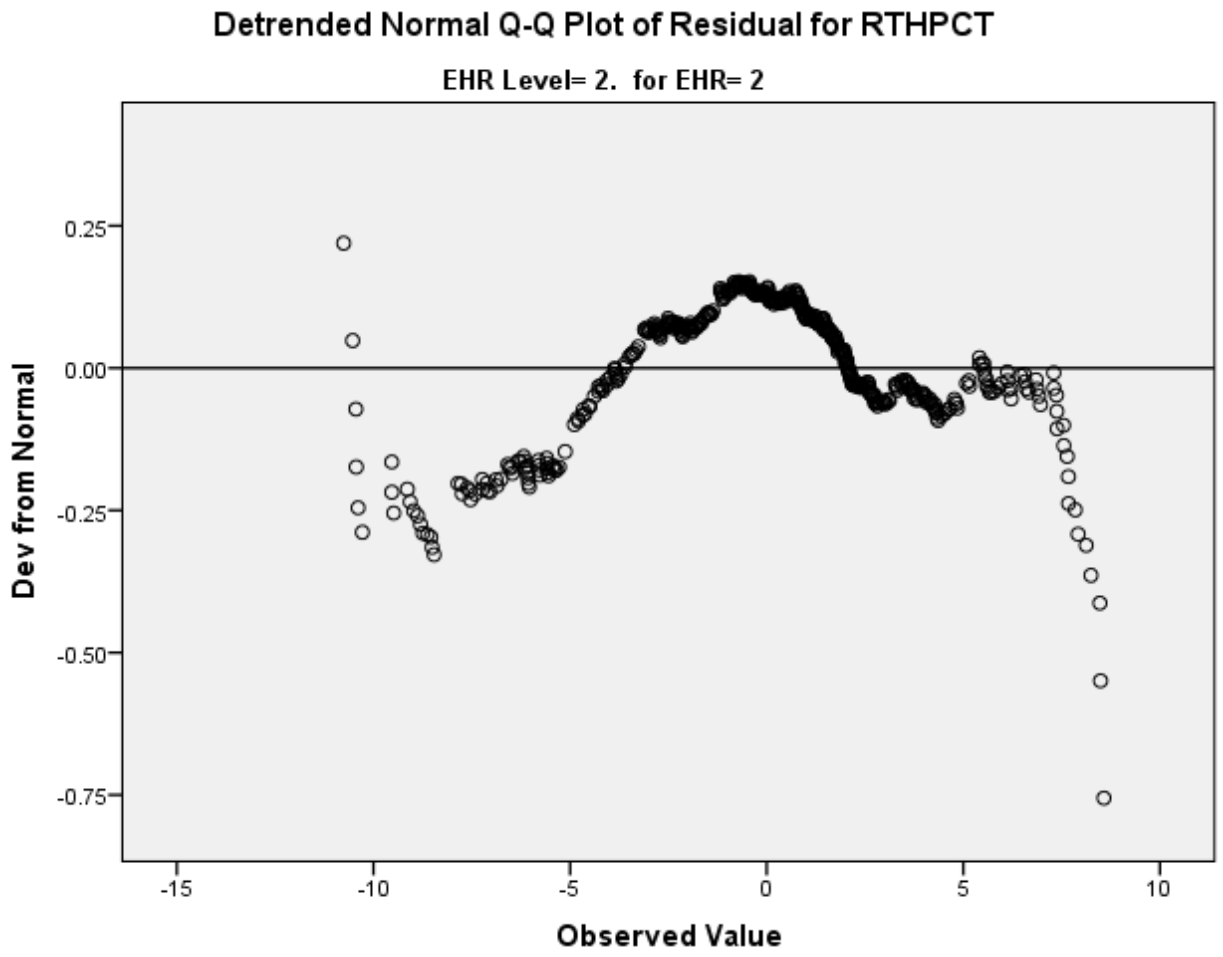

Normal Q-Q Plot of Residual for RTHPCT
EHR Level= 1. for EHR= 1
Expected Normal
4
2
0
-2
-4
-10
0
10
20
Observed Value



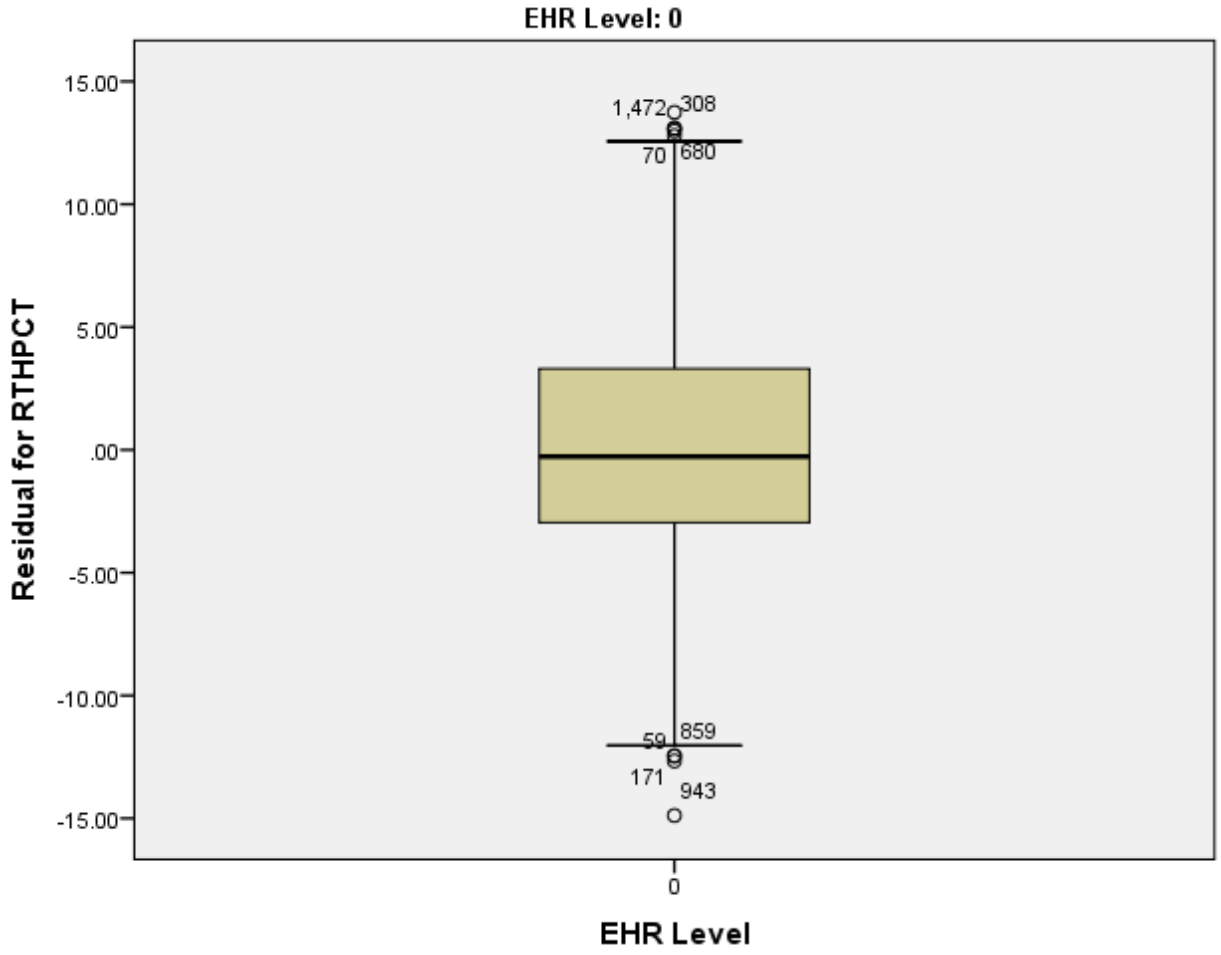
Detrended Normal Q-Q Plots

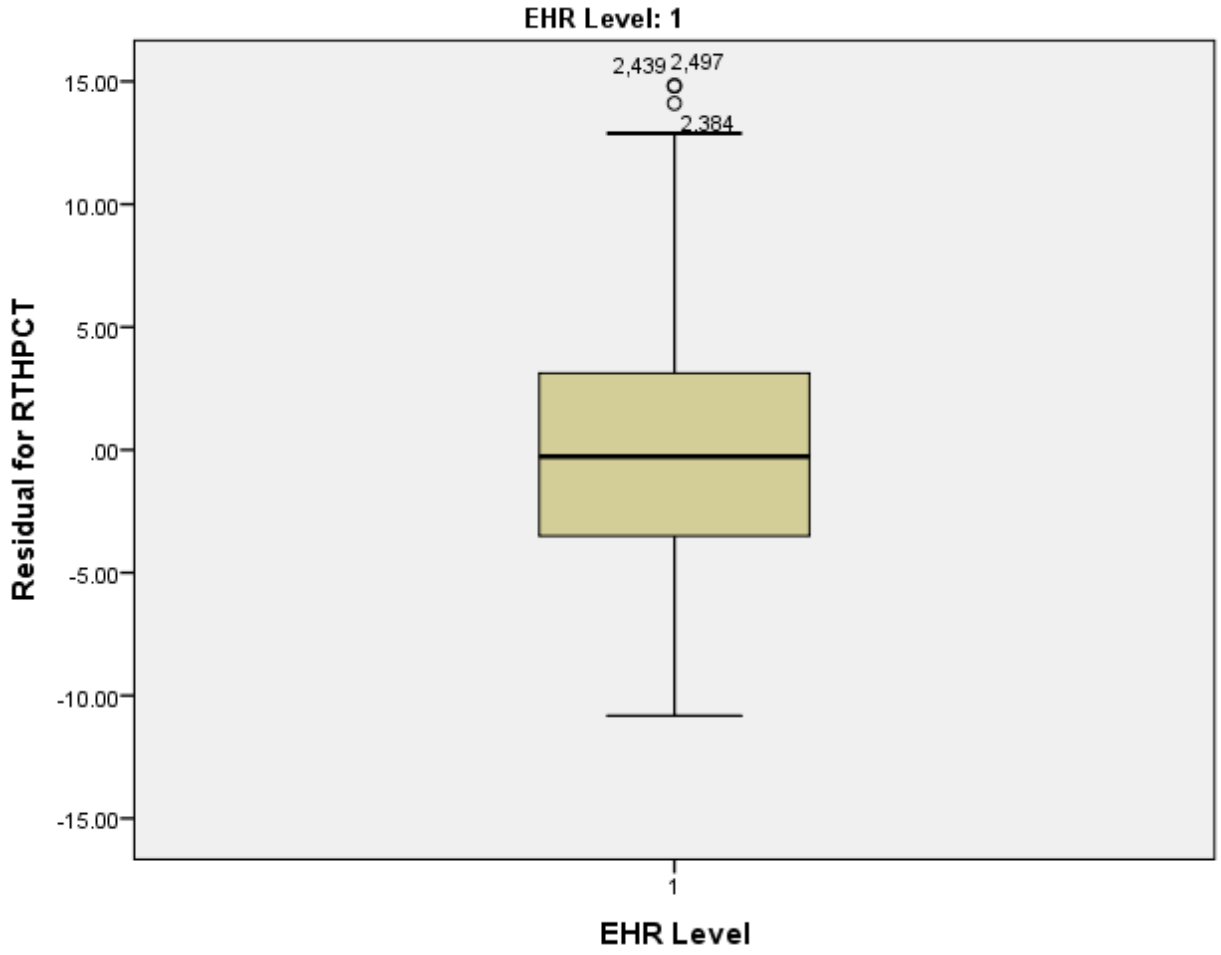

Detrended Normal Q-Q Plot of Residual for RTHPCT
EHR Level= 0. for EHR= 0
Dev from Normal
0.4
0.2
0.0
-0.2
-15
-10
-5
0
5
10
15
Observed Value

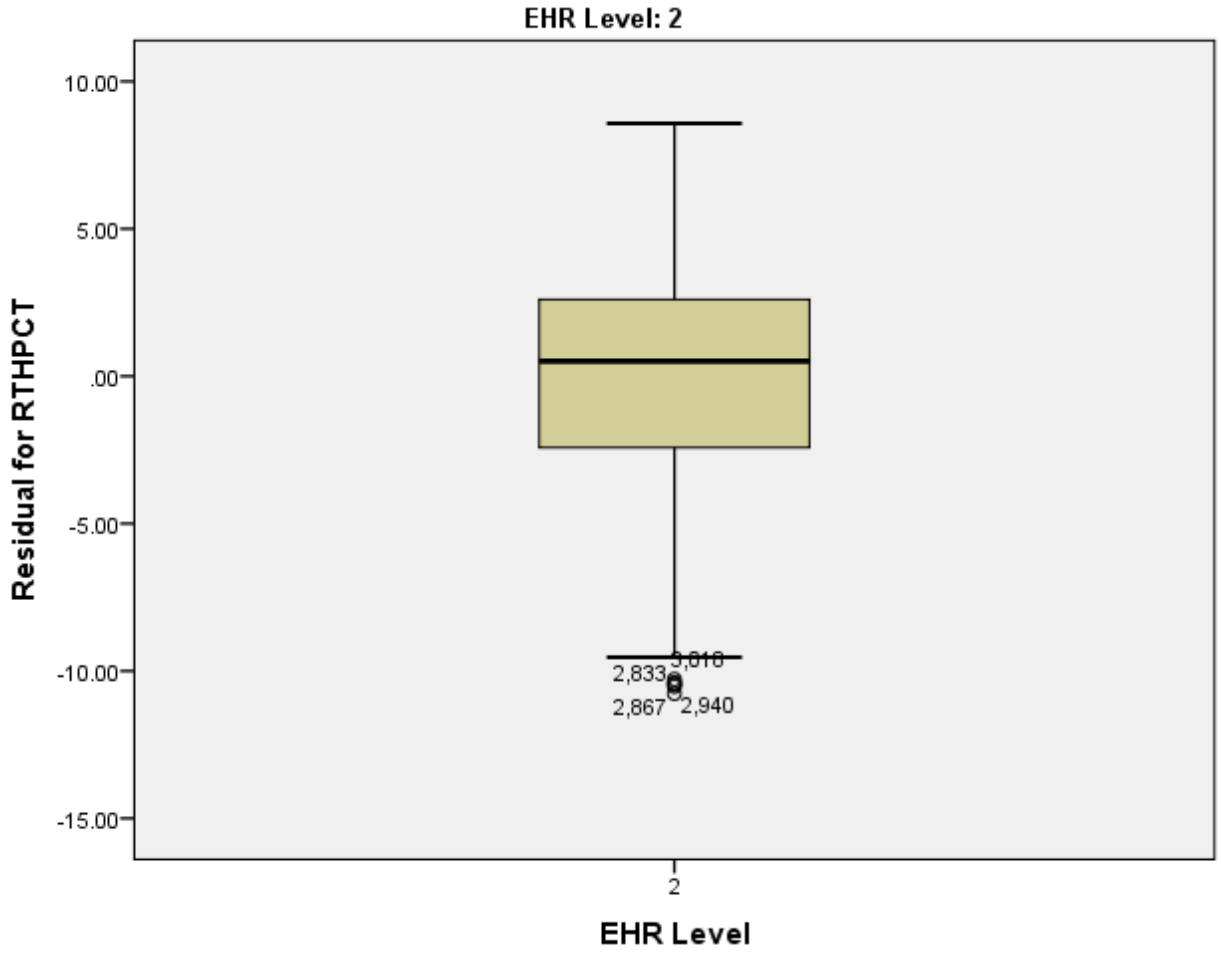

Detrended Normal Q-Q Plot of Residual for RTHPCT
EHR Level= 1. for EHR= 1
Dev from Normal
0.8
0.6
0.4
0.2
0.0
-0.2
-15
-10
-5
0
5
10
15
Observed Value


Detrended Normal Q-Q Plot of Residual for RTHPCT
EHR Level= 2. for EHR= 2
Dev from Normal
0.25
0.00
-0.25
-0.50
-0.75
-15
-10
-5
0
5
10
Observed Value

Boxplots

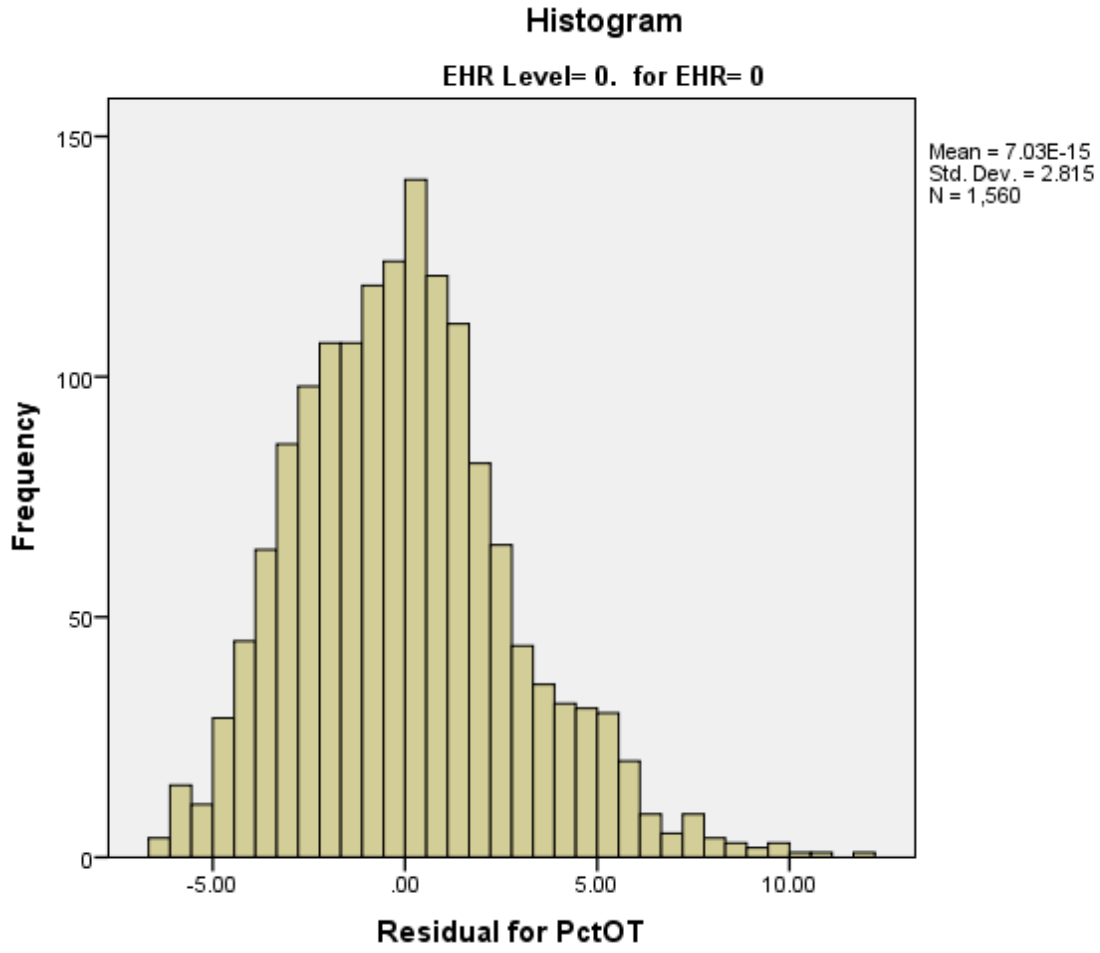

EHR Level: 0
Residual for RTHPCT
15.00
10.00
5.00
.00
-5.00
-10.00
-15.00
1,472
308
70
680
59
859
171
943
0
EHR Level

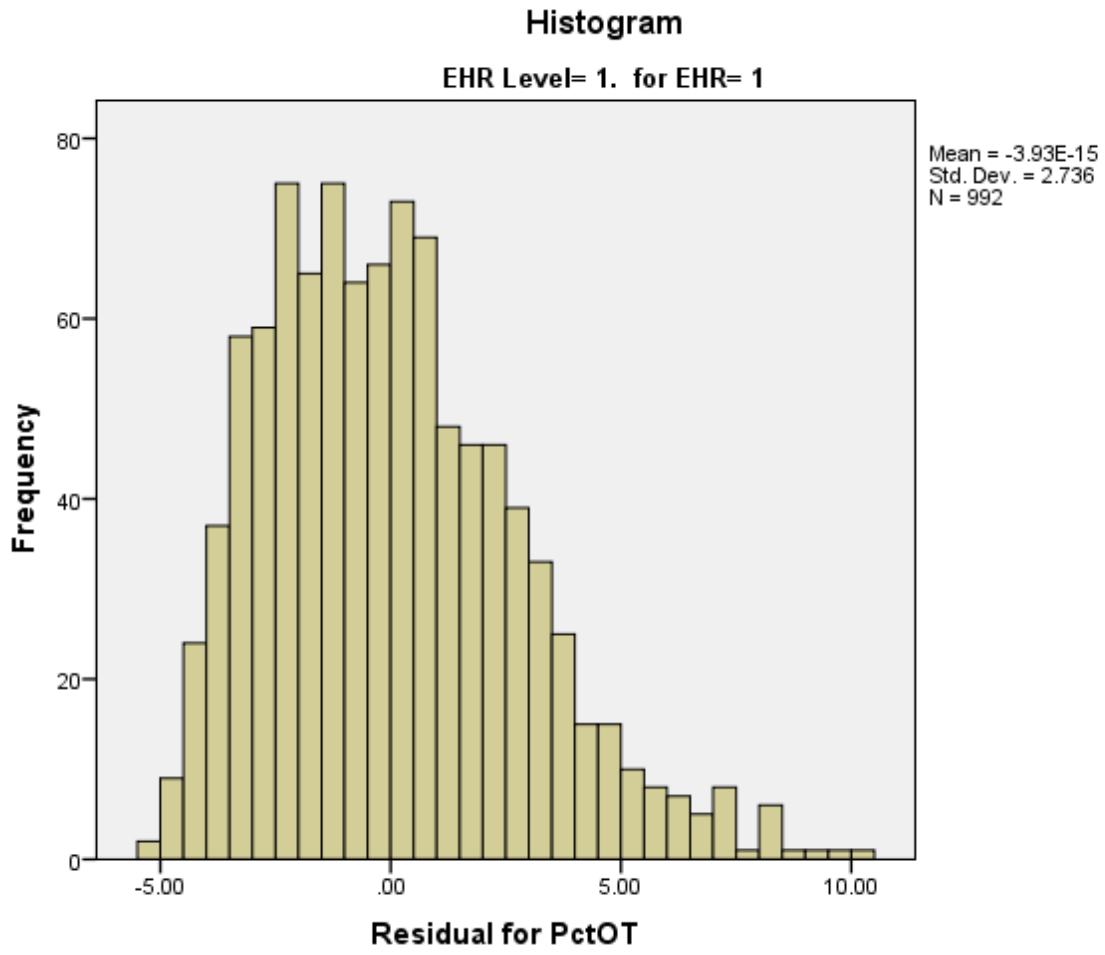

EHR Level: 1
2,439
2,497
2,384
15.00
10.00
5.00
.00
-5.00
-10.00
-15.00
Residual for RTHPCT
1
EHR Level

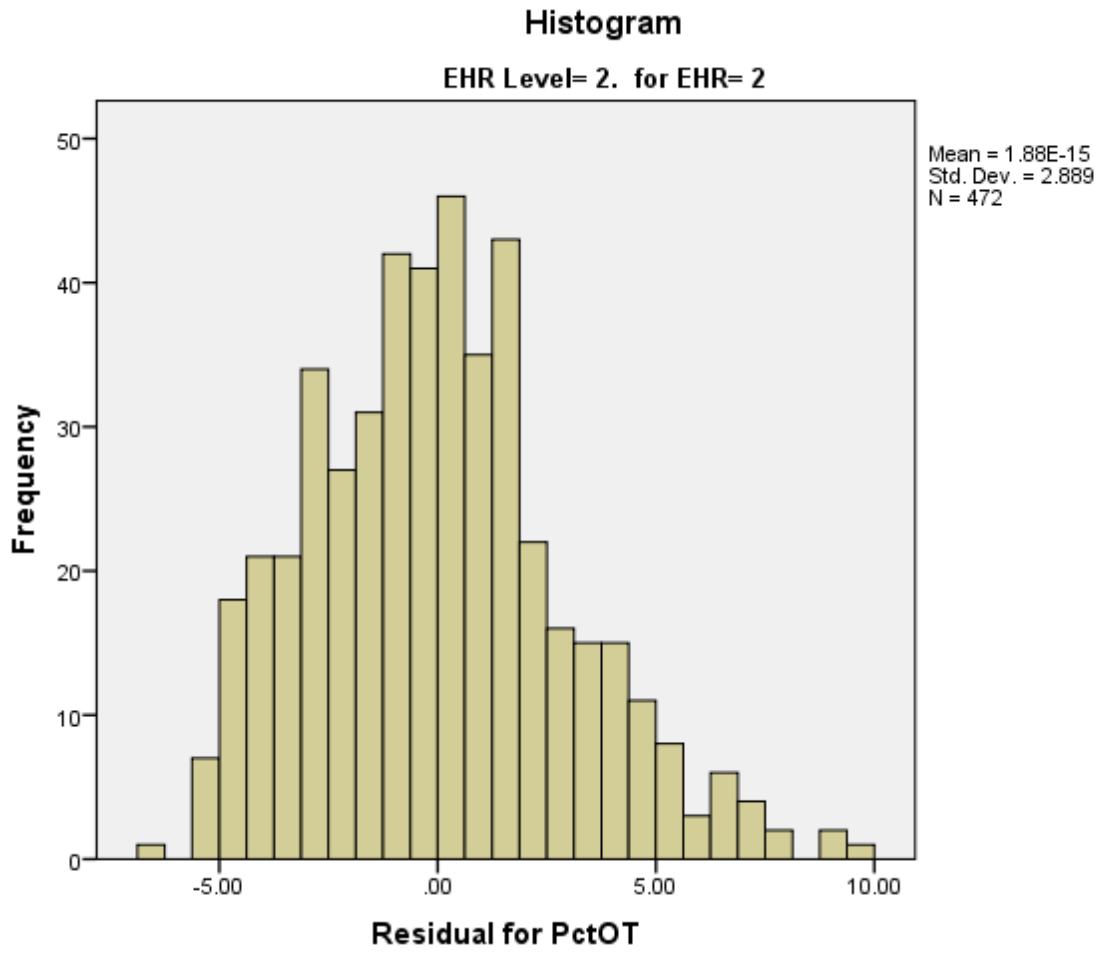


Residual for PctOT

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 7.03E-15
Std. Dev. = 2.815
N = 1,560
Frequency
150
100
50
0
-5.00
.00
5.00
10.00
Residual for PctOT


Histogram
EHR Level= 1. for EHR= 1
Mean = -3.93E-15
Std. Dev. = 2.736
N = 992
Frequency
80
60
40
20
0
-5.00
.00
5.00
10.00
Residual for PctOT



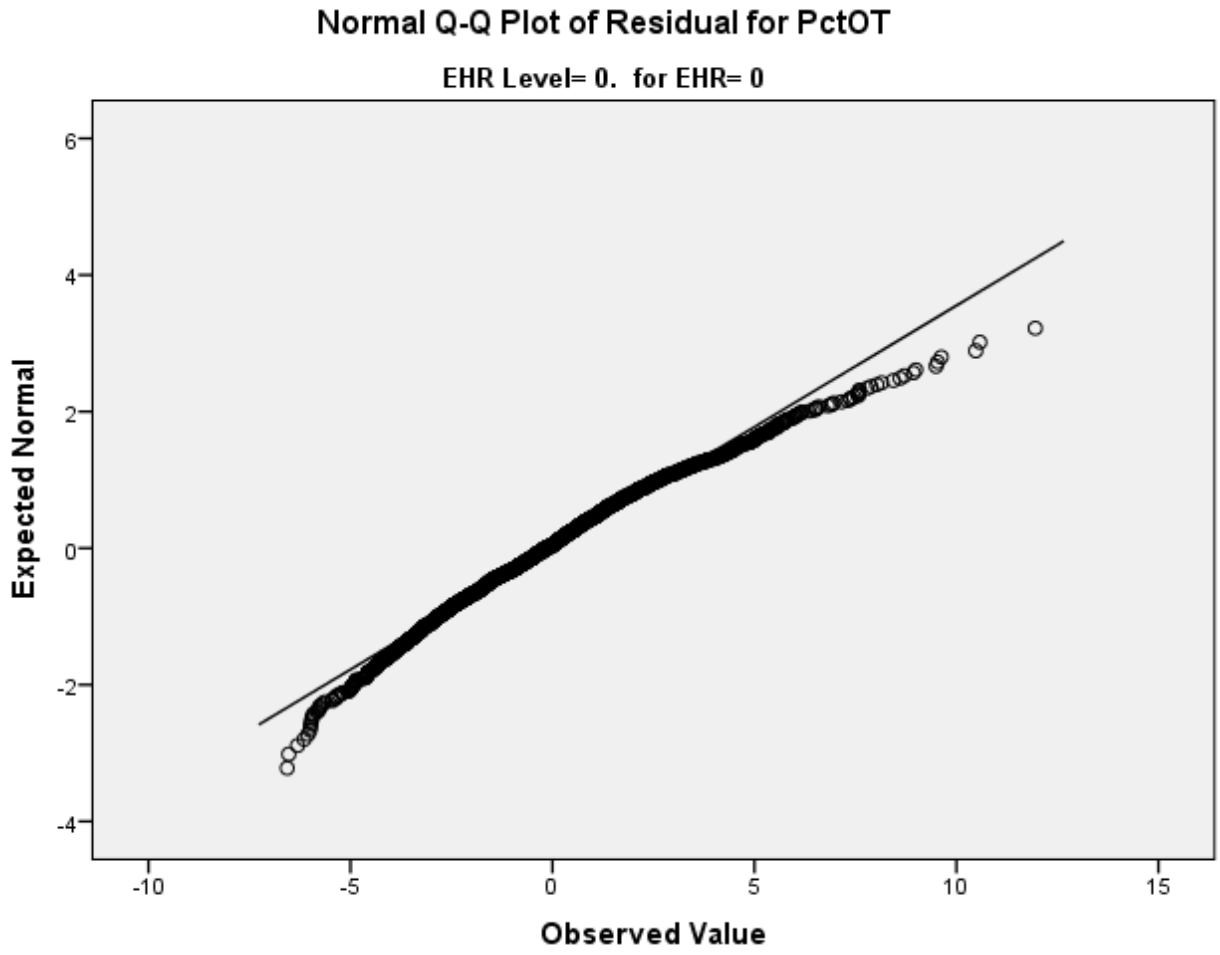
Stem-and-Leaf Plots

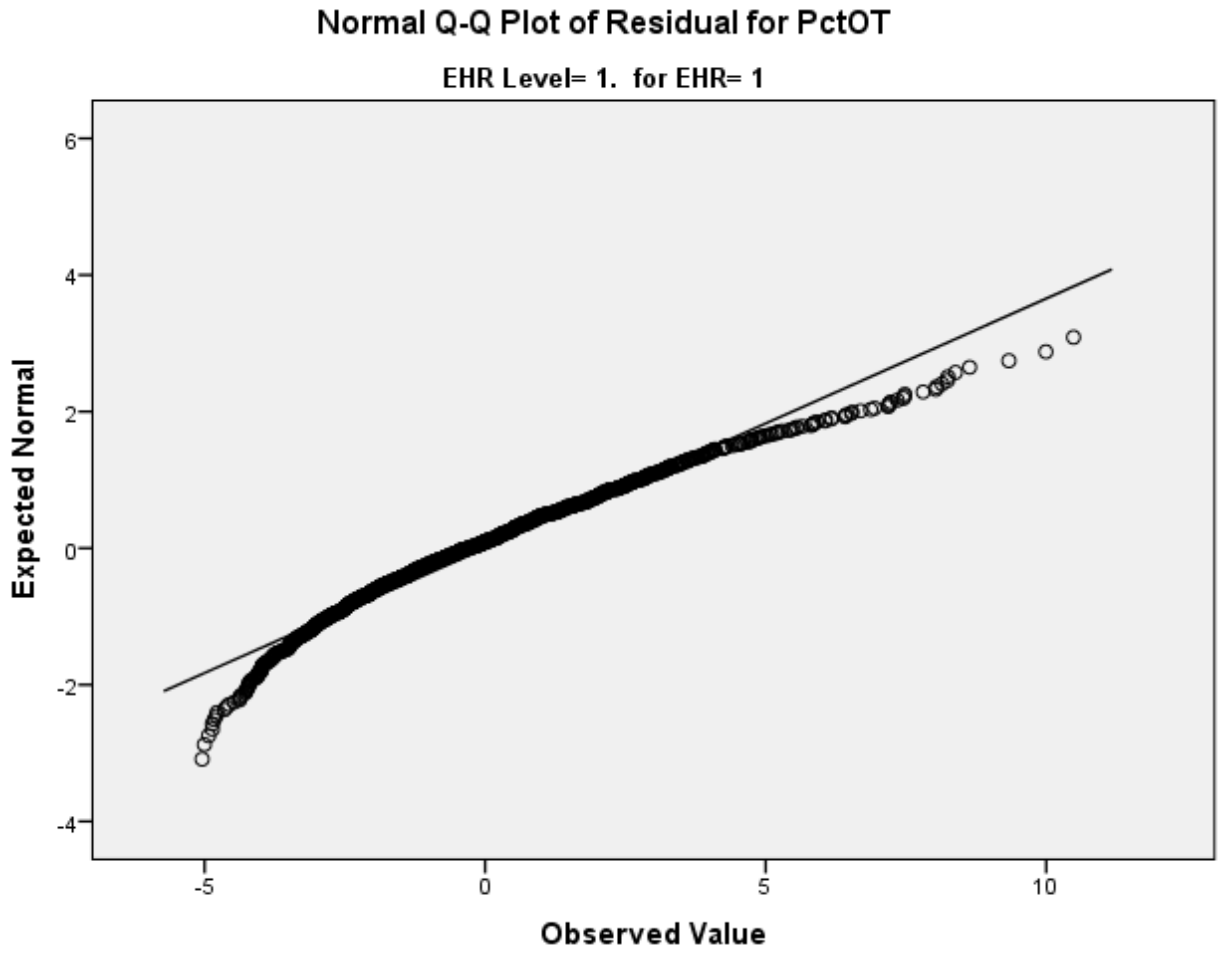
```
Residual for PctOT Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

     2.00       -6 .  5
     4.00       -6 .  0&
    13.00       -5 .  677999&
    11.00       -5 .  0234&
    26.00       -4 .  55556688999&
```

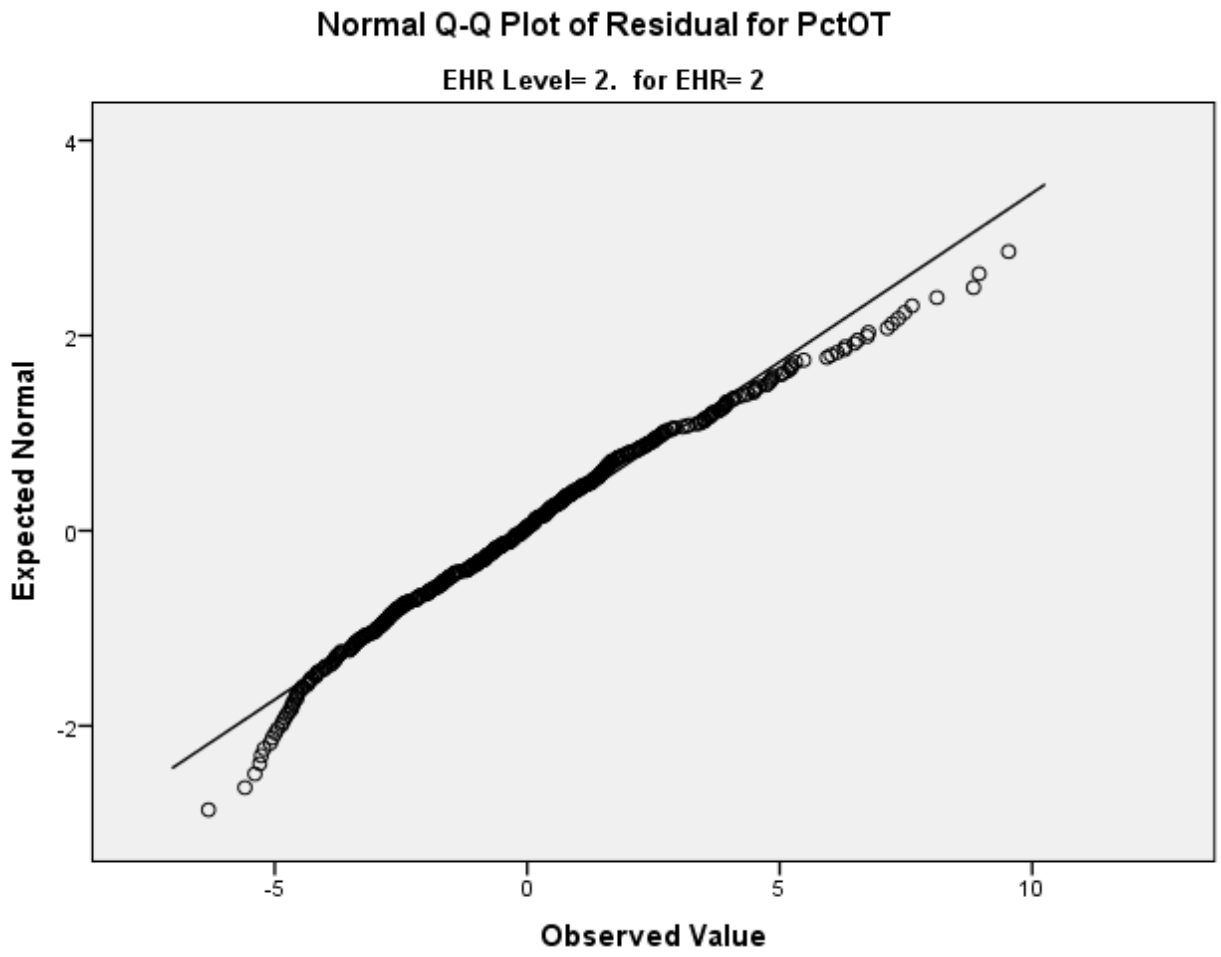
```
    36.00       -4 .  00001112233333444
    53.00       -3 .  555555566677778888899999
    71.00       -3 .  000000011111122222222333333444444
    89.00       -2 .  55555555556666666677777778888888899999999
    87.00       -2 .  000000000011111112222222233333334444444
   106.00       -1 .
555555555555566666666667777777777778888888899999999
    91.00       -1 .  000000000011111111222222223333333344444444
   102.00       -0 .  55555555666666666667777777777888888888889999999
   118.00       -0 .
000000000011111112222222222222223333333344444444444444444
   129.00        0 .
0000000000000111111111111112222222222222333333333334444444444
   115.00        0 .
555555555555566666666666777777777777888888888999999999
   102.00        1 .
000000001111111111111222222222333333333333444444444
    76.00        1 .  55555556666666666777777788888899999
    70.00        2 .  000000000111111222223333333444444
    45.00        2 .  556666667777777888899
    40.00        3 .  0000011112223333444
    26.00        3 .  5555667778889
    36.00        4 .  00001112223334444
    24.00        4 .  5556677899
    27.00        5 .  000011223334
    19.00        5 .  55557789&
     9.00        6 .  001&
     8.00        6 .  559&
    25.00 Extremes    (>=7.2)

 Stem width:      1.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.



Residual for PctOT Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     2.00       -5 .  0
    33.00       -4 .  00011222233678&
    95.00       -3 .  000000001111222233334444444455566777788899999
   134.00       -2 .
000000000111122222333333344444444455555555666677777788888999999
   140.00       -1 .
000000011111112222222233333333344444455555666666677778888888999999
   130.00       -0 .
00000001111111222222333344444444555556666666777778888889999999
   142.00        0 .
```

```
00000011111222222222233333444444444555555566666667777778888889999999
    94.00        1 .  000001122223333334444445556666777788888899999
    85.00        2 .  00000001111122333344445555666677888888999
    58.00        3 .  000111222223444455666778899
    30.00        4 .  000224557789&
    18.00        5 .  0124588&
    12.00        6 .  0145&
     8.00        7 .  124&
    11.00 Extremes    (>=7.8)

 Stem width:      1.00
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for PctOT Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

     1.00       -6 .  3
     7.00       -5 .  0022235
    29.00       -4 .  00111122333445555566667778899
    36.00       -3 .  000011222233334444445566777788888999
    49.00       -2 .  00111111122334444444555556666677777778888888889999
    51.00       -1 .
000111111111233444444455555556666666777778888999999
    70.00       -0 .
00000000011111222222222233333444445555566666666677777778888888999999999
    70.00        0 .
00000001111111111222233333333444444444555566666666777777778888899999
    59.00        1 .
0000000111122222333334444444445555555555666666677777889999
    32.00        2 .  00111222233334444555566666777889
    25.00        3 .  0123445555566666788899999
    17.00        4 .  00012345555778888
     9.00        5 .  001222349
     8.00        6 .  01224577
     1.00        7 .  1
     8.00 Extremes    (>=7.2)

 Stem width:      1.00
 Each leaf:        1 case(s)
```

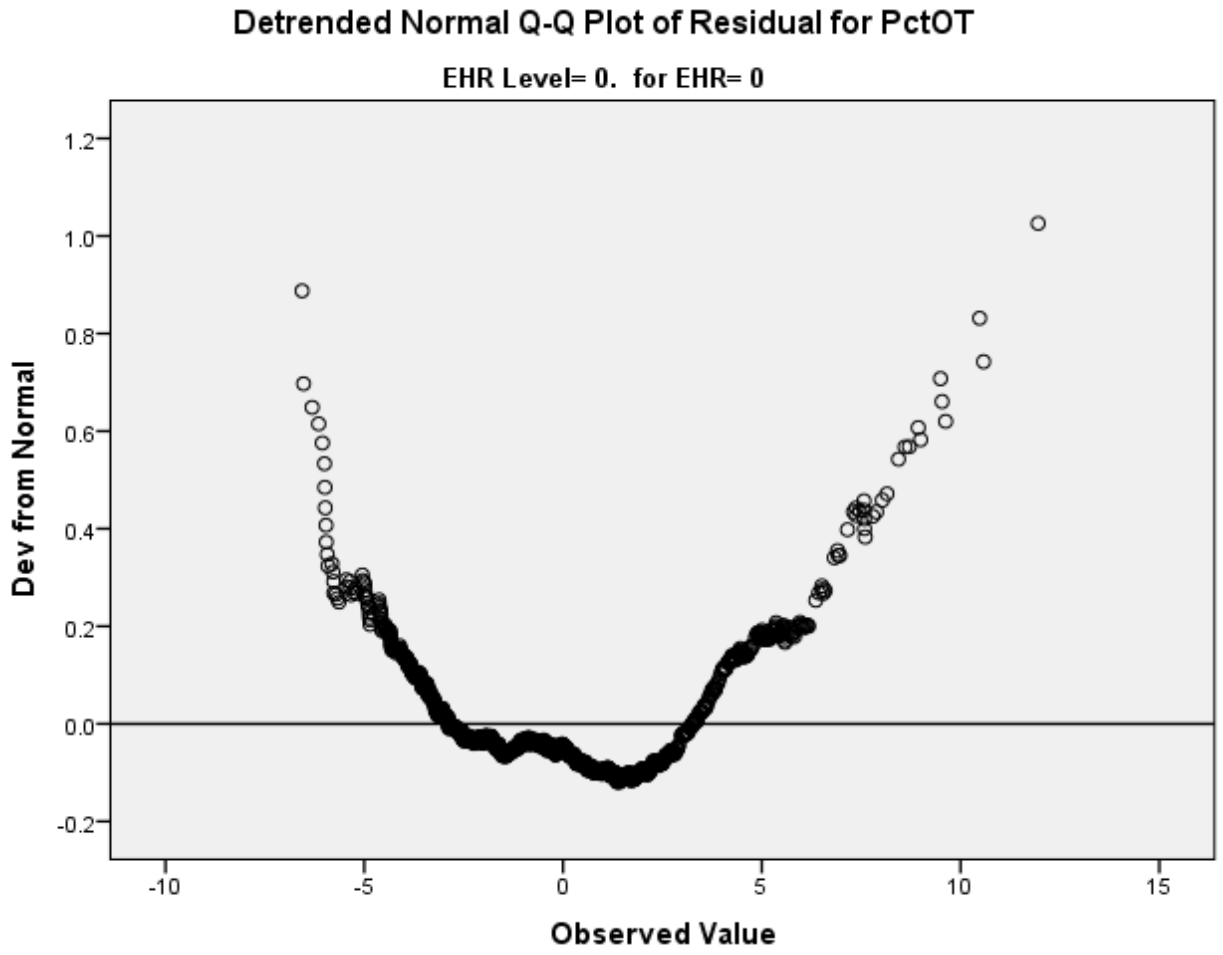
Normal Q-Q Plots

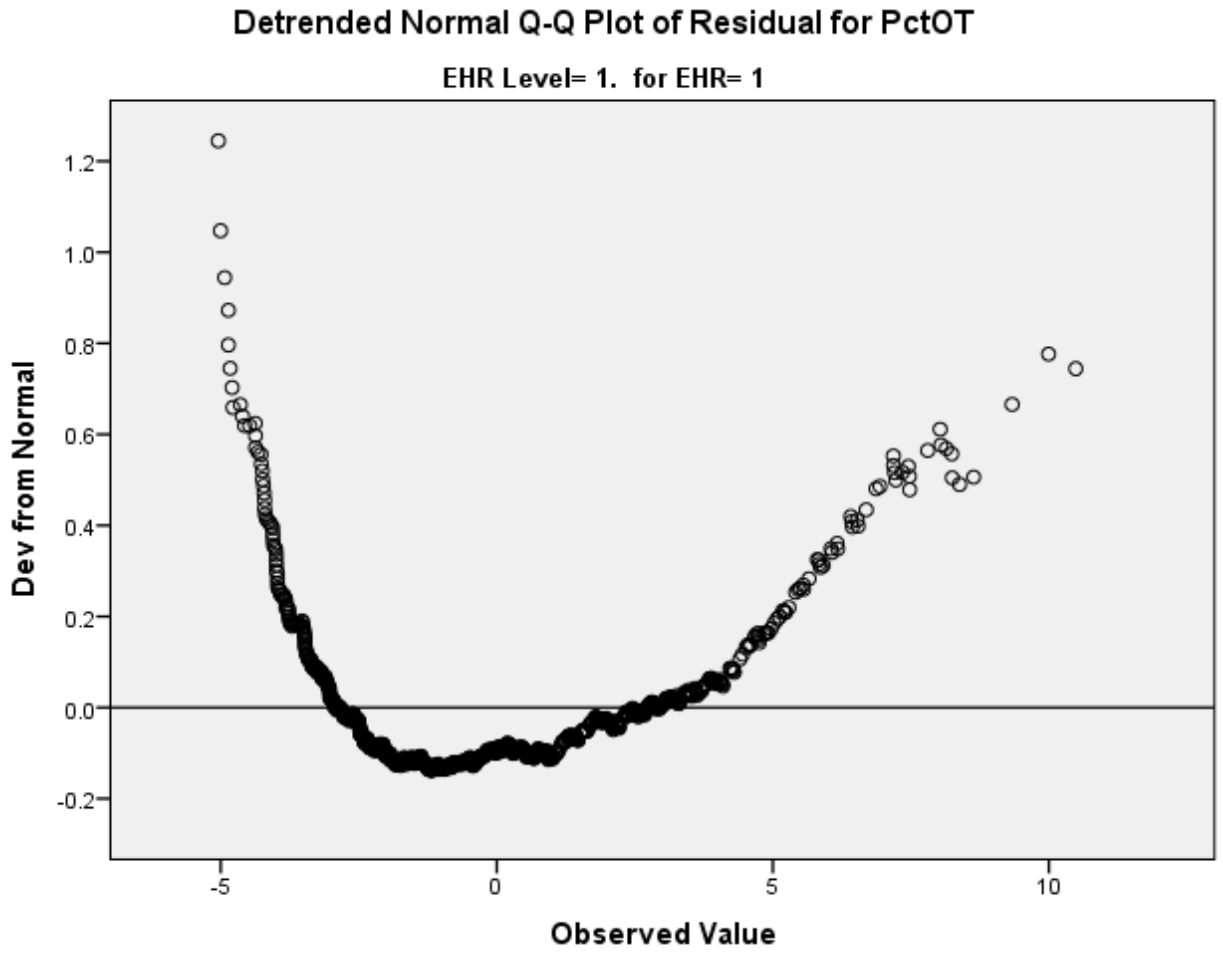


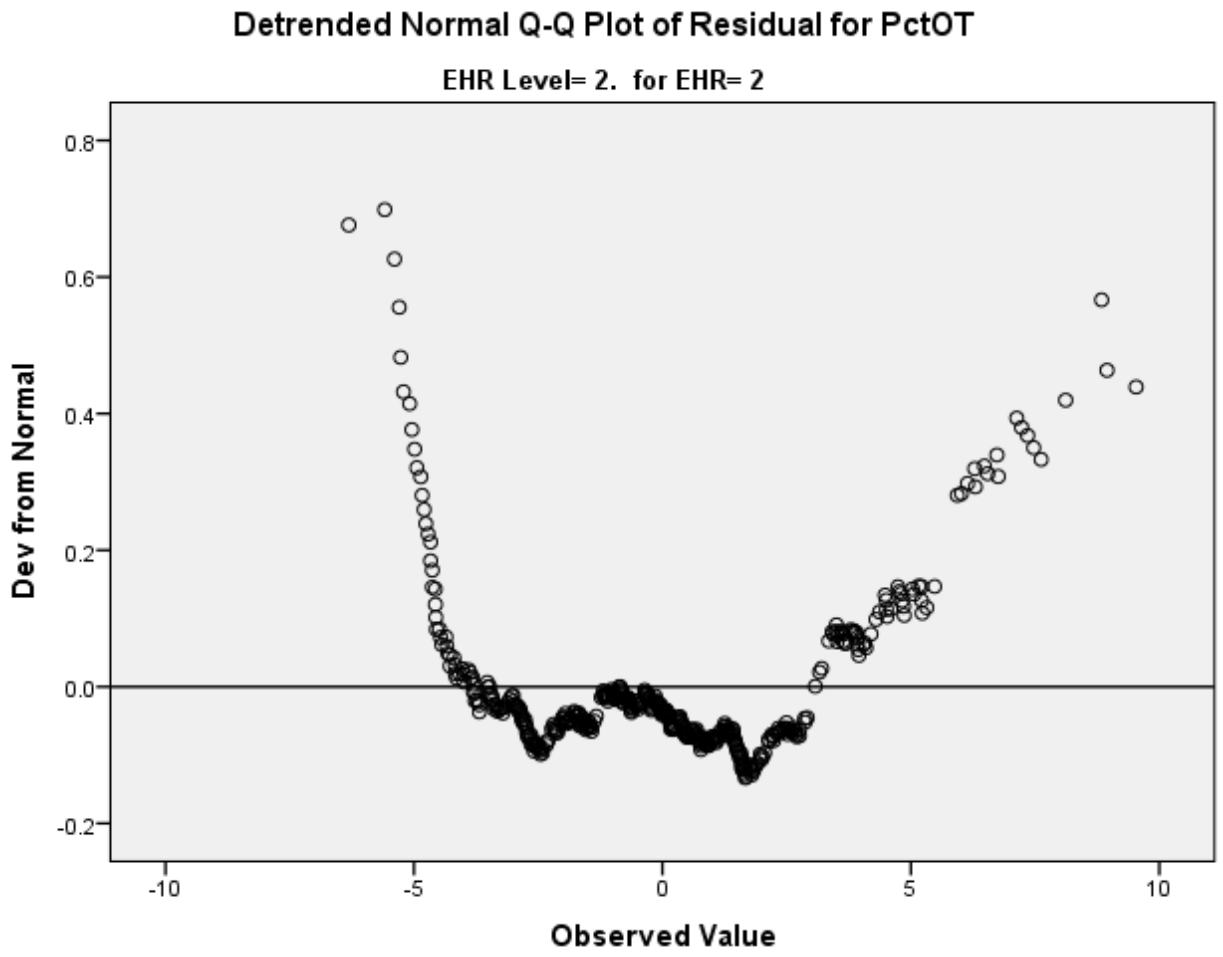

Normal Q-Q Plot of Residual for PctOT
EHR Level= 1. for EHR= 1
Expected Normal
6
4
2
0
-2
-4
-5
0
5
10
Observed Value



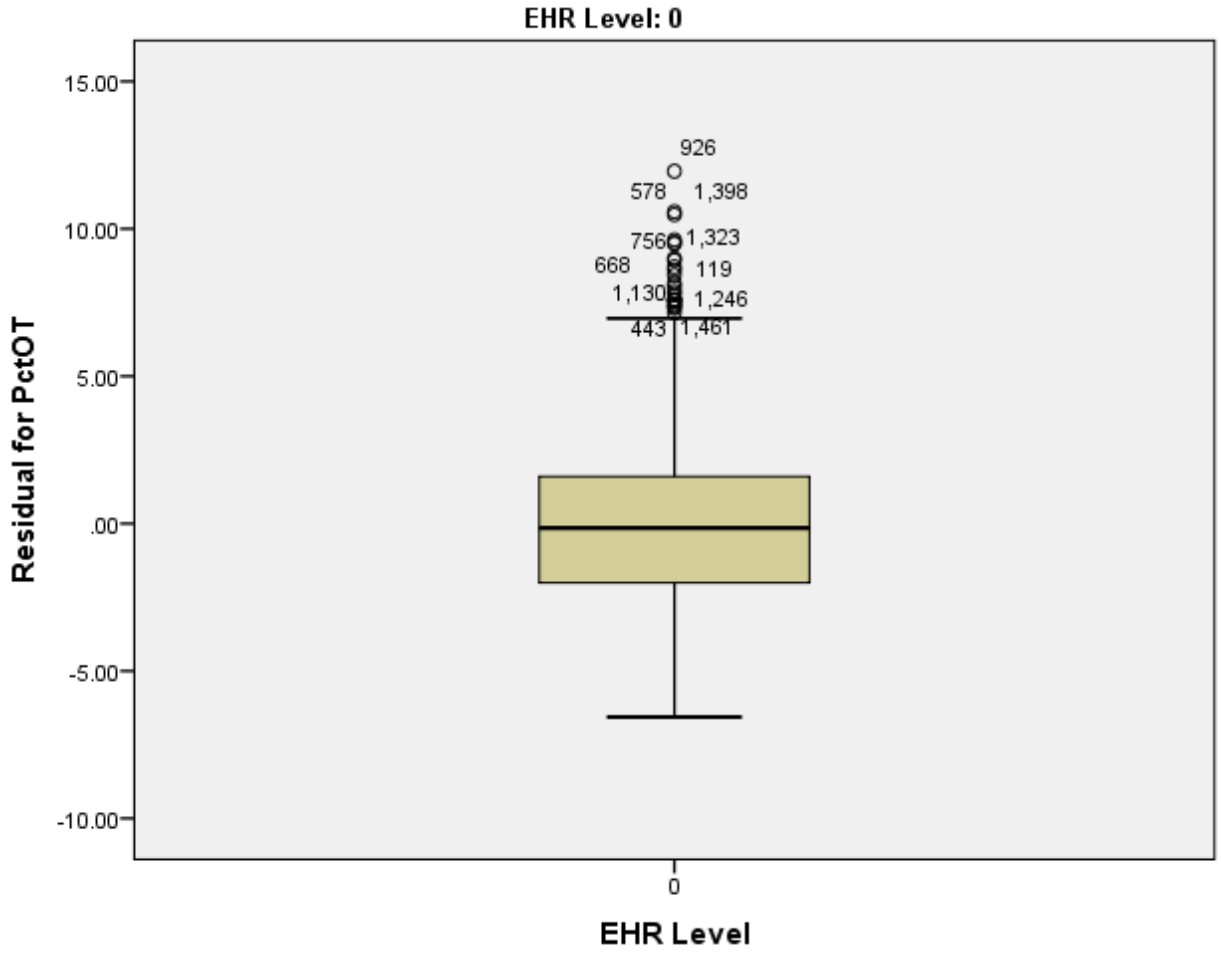
Detrended Normal Q-Q Plots

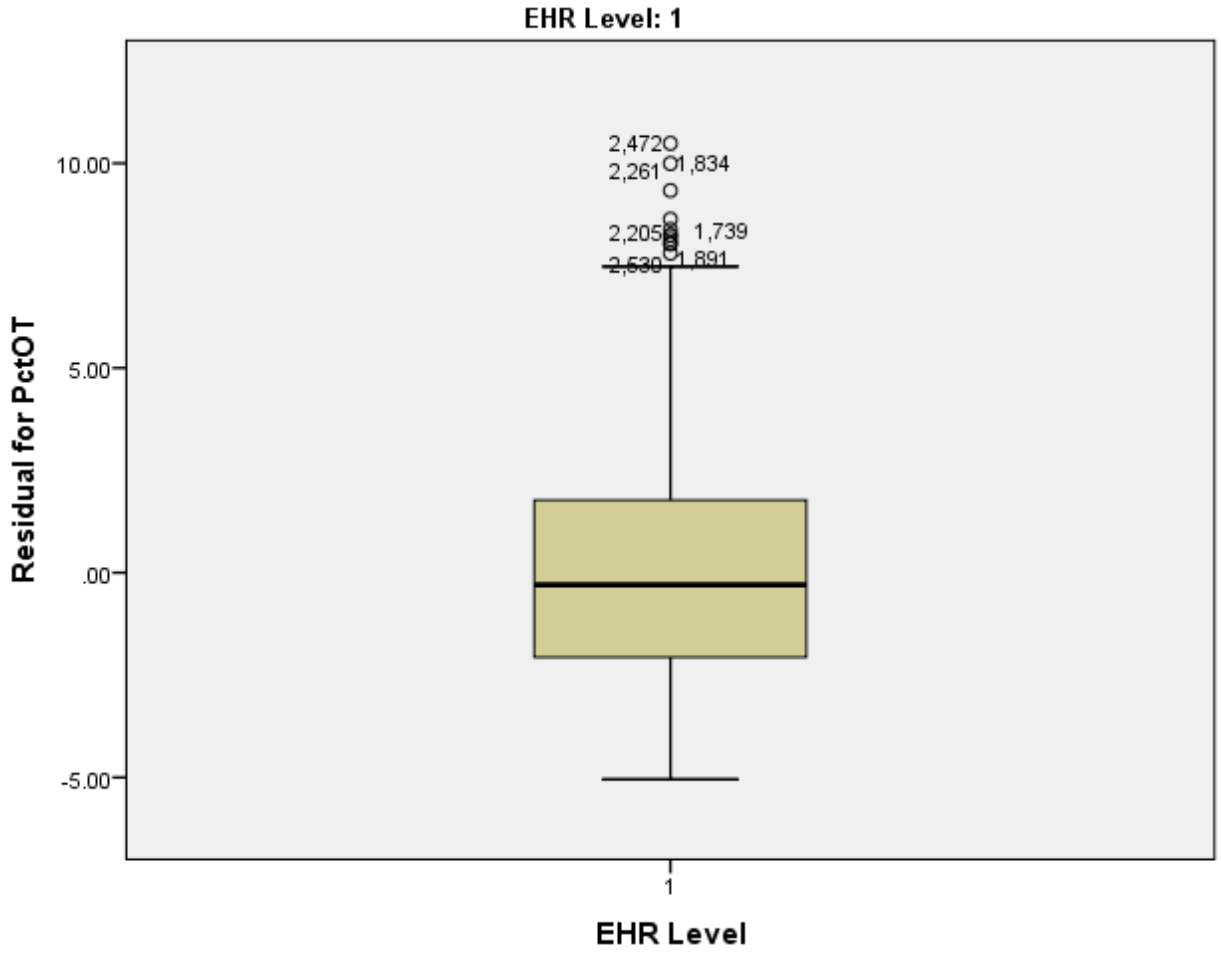

Detrended Normal Q-Q Plot of Residual for PctOT
EHR Level= 0. for EHR= 0
Dev from Normal
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-10
-5
0
5
10
15
Observed Value

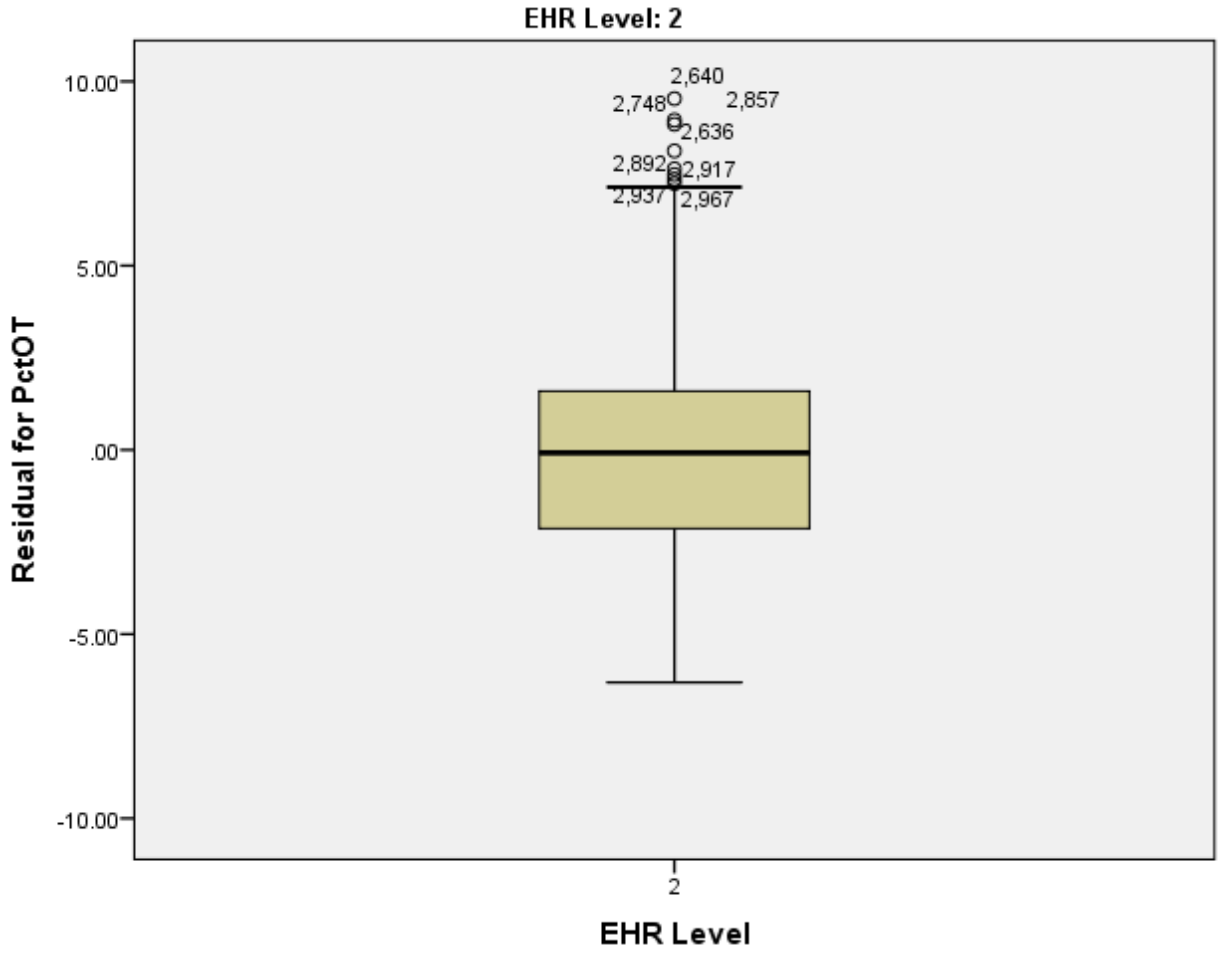

Detrended Normal Q-Q Plot of Residual for PctOT
EHR Level= 1. for EHR= 1
Dev from Normal
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-5
0
5
10
Observed Value


Detrended Normal Q-Q Plot of Residual for PctOT
EHR Level= 2. for EHR= 2
Dev from Normal
0.8
0.6
0.4
0.2
0.0
-0.2
-10
-5
0
5
10
Observed Value

Boxplots

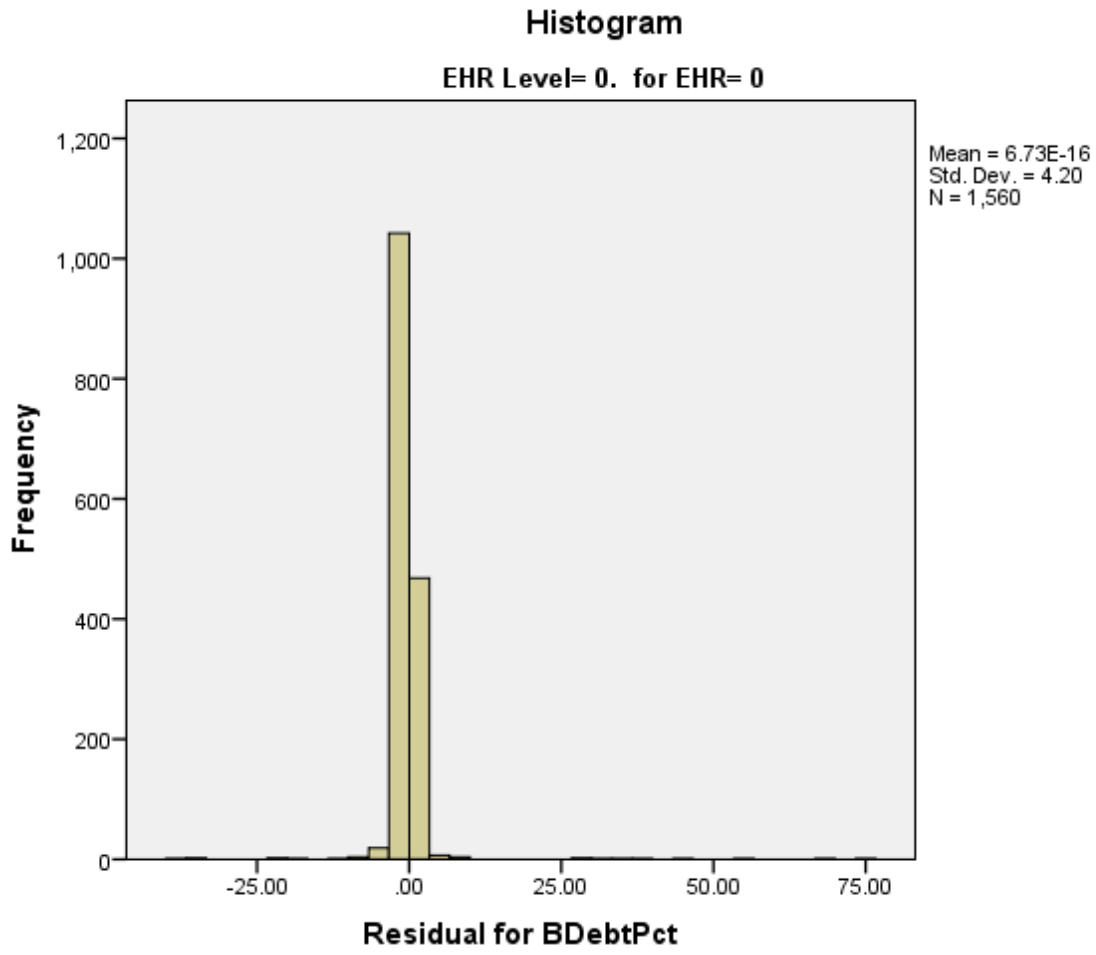

EHR Level: 0
15.00
10.00
5.00
.00
-5.00
-10.00
Residual for PctOT
926
578
1,398
756
1,323
668
119
1,130
1,246
443
1,461
0
EHR Level

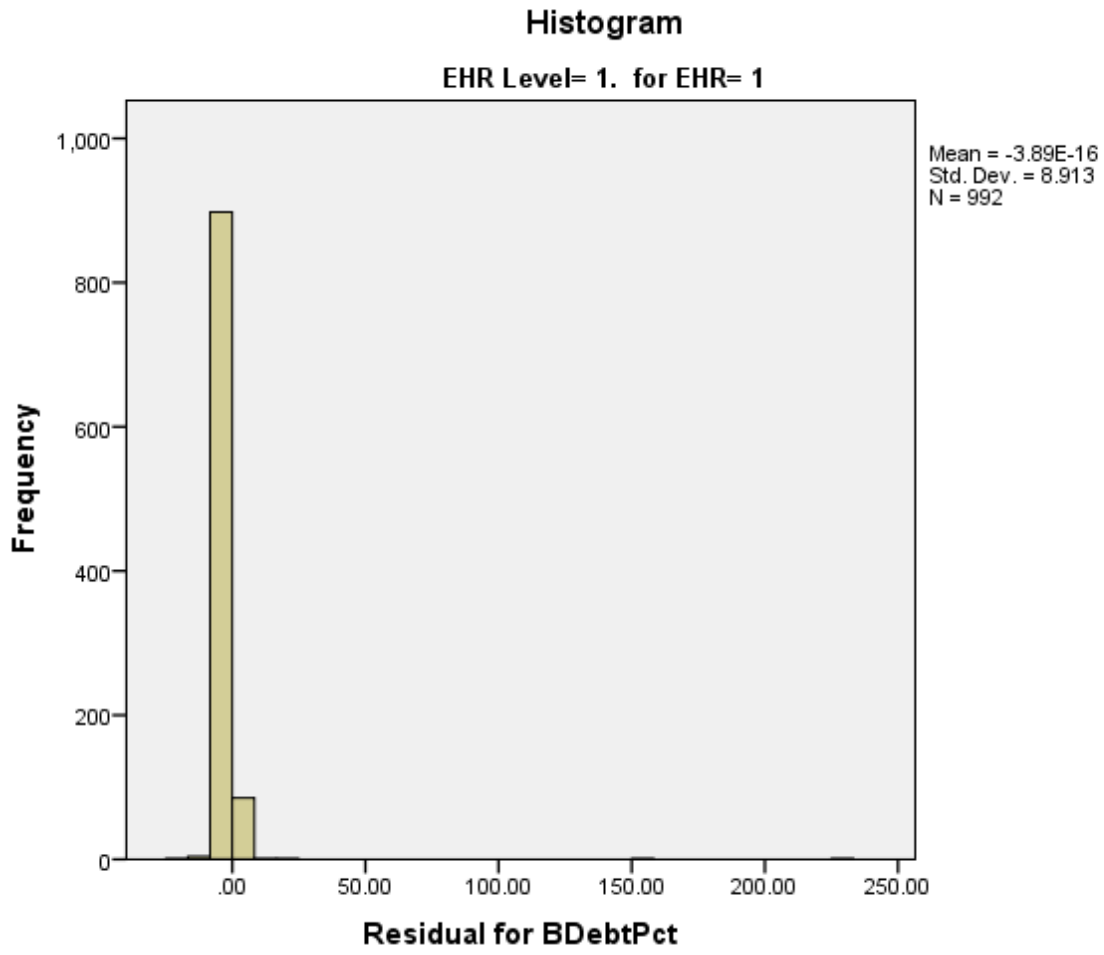

EHR Level: 1
Residual for PctOT
10.00
5.00
.00
-5.00
2,472
2,261
1,834
2,205
1,739
1,891
1
EHR Level

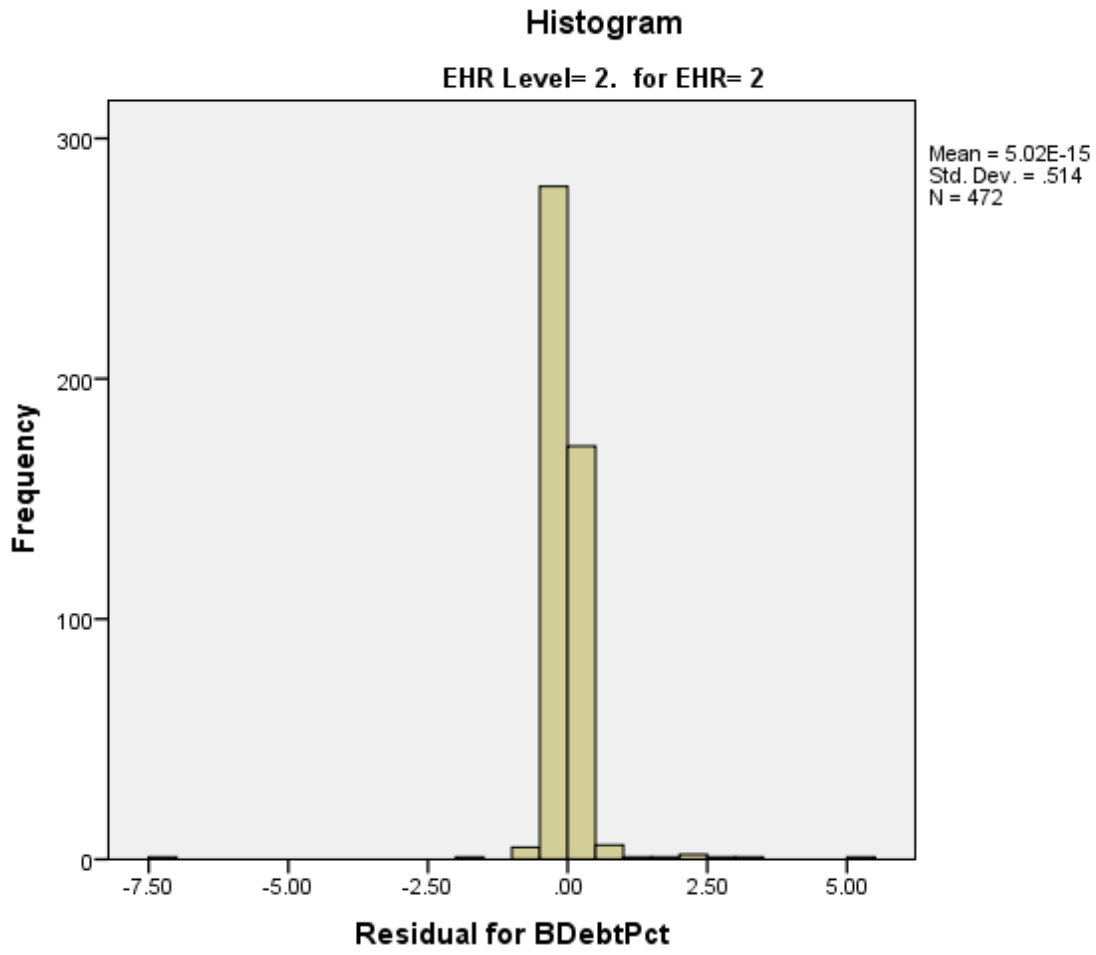


Residual for BDebtPct

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 6.73E-16
Std. Dev. = 4.20
N = 1,560
Frequency
1,200
1,000
800
600
400
200
0
-25.00
.00
25.00
50.00
75.00
Residual for BDebtPct


Histogram
EHR Level= 1. for EHR= 1
Mean = -3.89E-16
Std. Dev. = 8.913
N = 992
Frequency
1,000
800
600
400
200
0
.00
50.00
100.00
150.00
200.00
250.00
Residual for BDebtPct



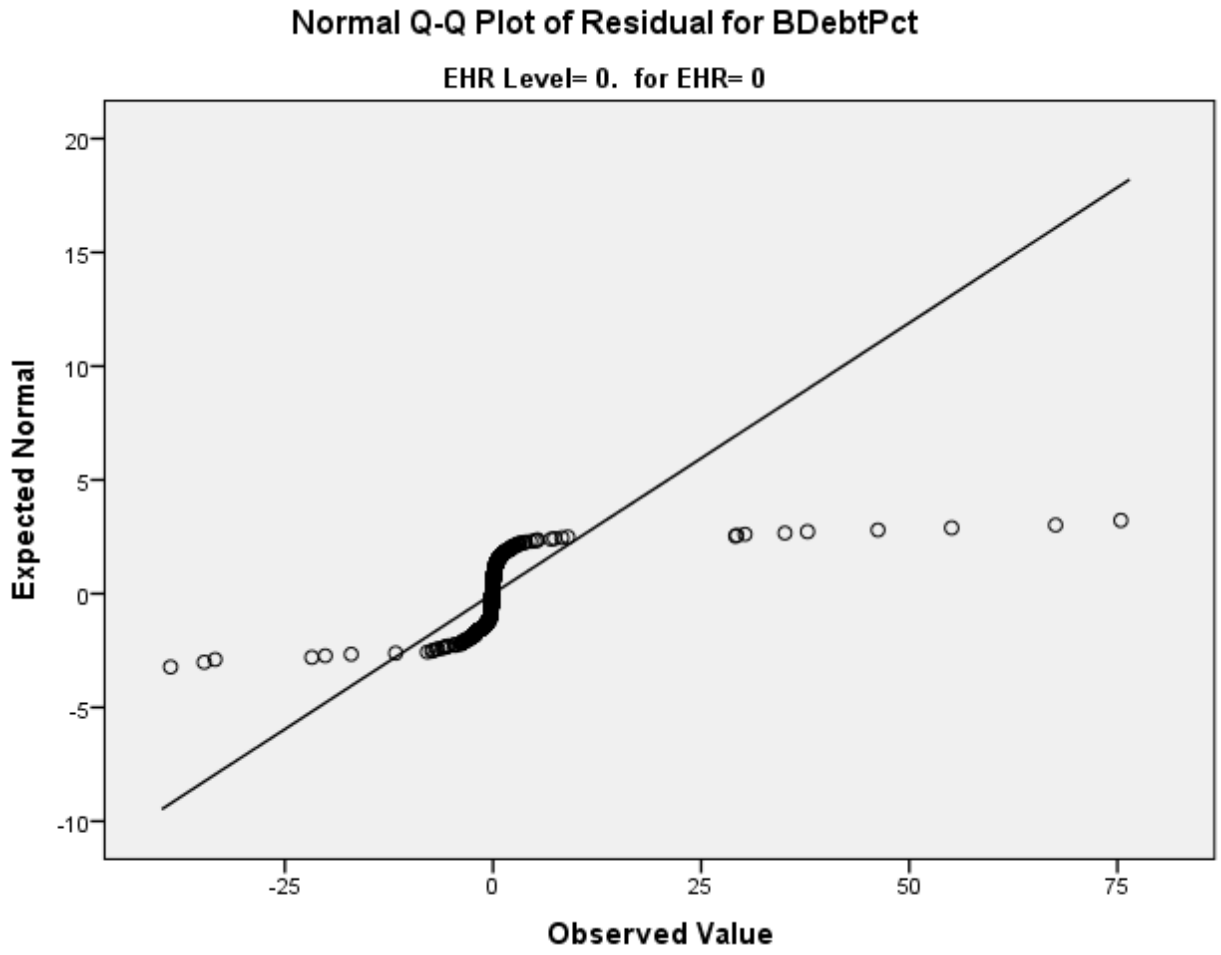
Stem-and-Leaf Plots

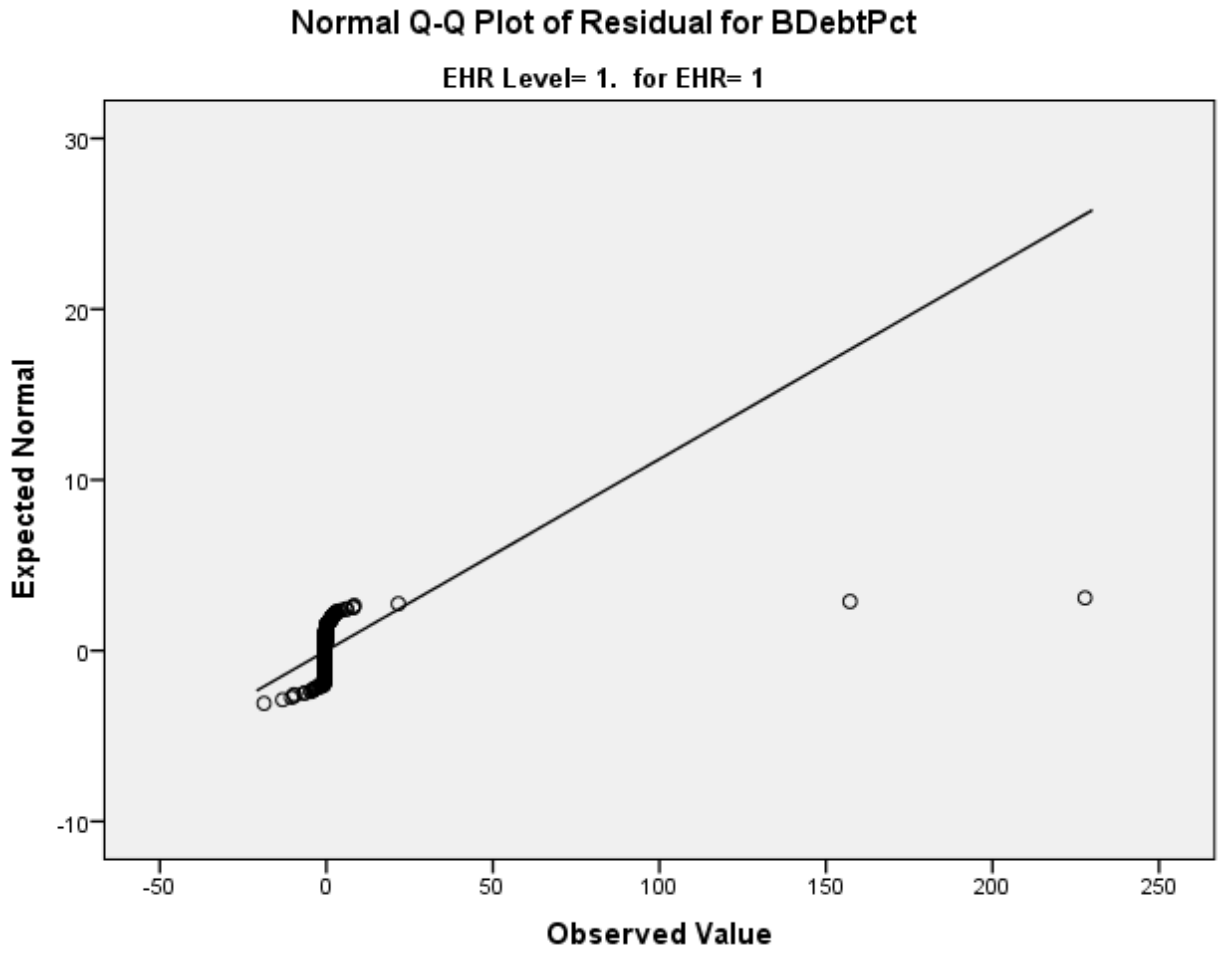
```
Residual for BDebtPct Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

   169.00 Extremes    (=<-.63)
     2.00       -6 .  &
    10.00       -5 .  5567&
    15.00       -5 .  001123
    13.00       -4 .  567899
```

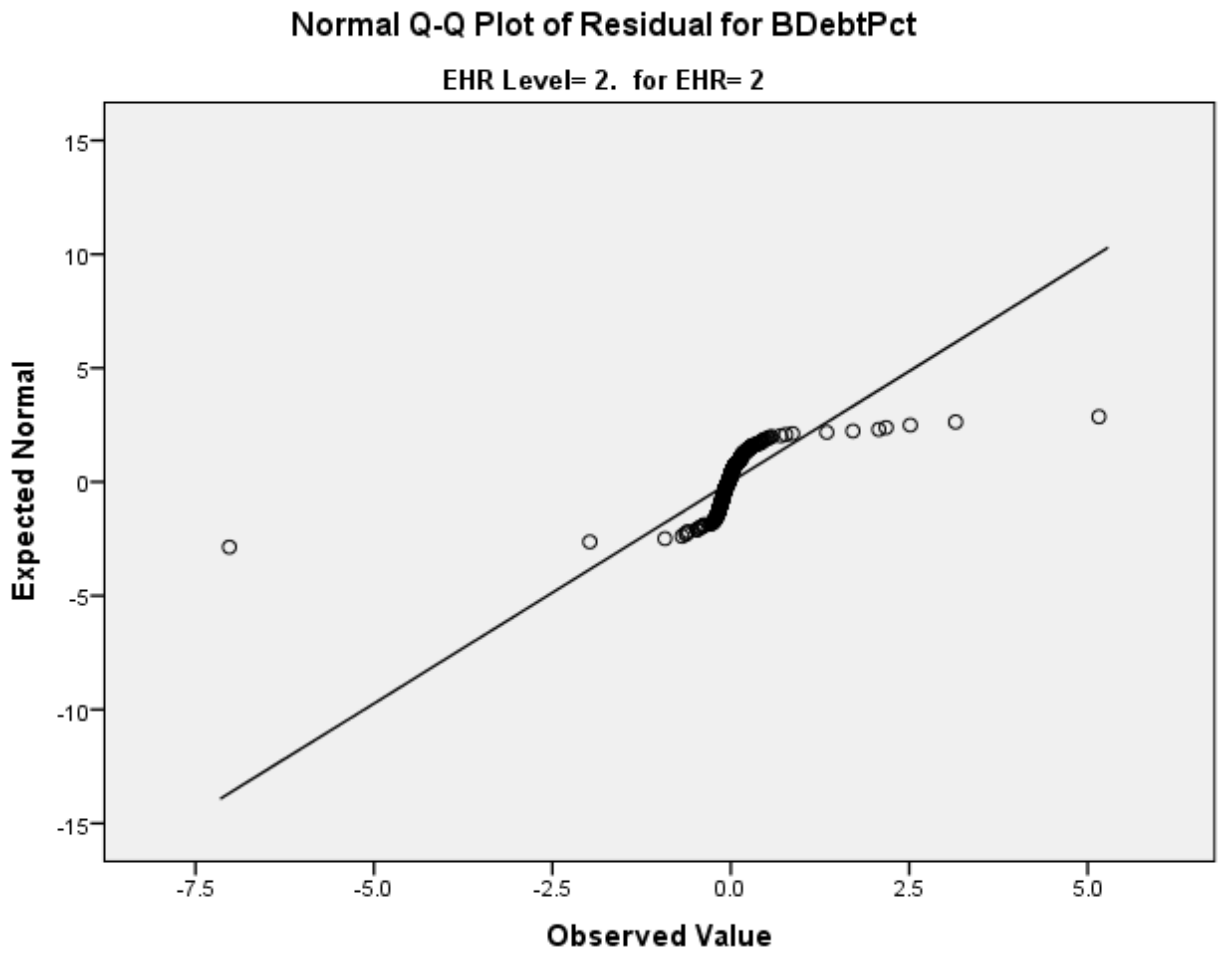
```
    13.00       -4 .  00234&
    19.00       -3 .  55566778&
    35.00       -3 .  0000011112233444
    57.00       -2 .  555555555566666667777889999
   110.00       -2 .
00000000001111111111111112222223333333333444444444
   145.00       -1 .
55555555555556666666666667777777777777778888888888888888999999999999999
   160.00       -1 .
00000000000000001111111111111112222222222222223333333333333333334444444
44444444
   174.00       -0 .
55555555555555556666666666666666666667777777777777777788888888888888889
99999999999999
   150.00       -0 .
00000000000000111111111111122222222222222222233333333333333444444444444
44
    92.00        0 .  000000000111111122222222333333333333444444444
    66.00        0 .  555555555666667777777788888899999
    58.00        1 .  000001111112222233333344444
    48.00        1 .  55555566666677778889999
    28.00        2 .  0011111223344
    21.00        2 .  5667778999
    17.00        3 .  0000224&
    16.00        3 .  566678&
     9.00        4 .  112&
     3.00        4 .  5&
   130.00 Extremes    (>=.47)

 Stem width:       .10
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for BDebtPct Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

    21.00 Extremes    (=<-1.01)
     1.00       -8 .  &
     4.00       -8 .  1&
     6.00       -7 .  67&
    10.00       -7 .  0224&
    34.00       -6 .  5555555566667799&
    86.00       -6 .  000000000011111111111222222233333333444444
   135.00       -5 .
55555555555555566666666666666677777777777777788888888899999999999
   126.00       -5 .
00000000011111111111111222222222222333333333333344444444444
```

```
    97.00       -4 .  55555555666666666677777788888888888999999999999
   104.00       -4 .
0000011111111111222222222223333333333333344444444444
    74.00       -3 .  555555556666677777888888888999999999
    60.00       -3 .  000111111122222333333333444444
    38.00       -2 .  555556667788899999
    41.00       -2 .  0001111233333444444
    28.00       -1 .  5667778888999
    21.00       -1 .  0001122344
     8.00       -0 .  889&
     9.00       -0 .  013&
     6.00        0 .  023
     5.00        0 .  56
    78.00 Extremes    (>=.06)

 Stem width:       .10
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for BDebtPct Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

    14.00 Extremes    (=<-.37)
     3.00       -2 .  668
    12.00       -2 .  000112223344
    39.00       -1 .  555555555555555666666667777778888889999
    70.00       -1 .
0000000000000000000111111111111112222222222223333333333333333444444444
    83.00       -0 .
555555555555555566666666666666666666777777777778888888888888888899999999
999999999999
    66.00       -0 .
000000000000000011111111112222222222222222233333333333333333334444
    72.00        0 .
0000000000000000011111111111111111122222222222233333333333444444444444
4
    23.00        0 .  55556666677777888888999
    29.00        1 .  000000111122223333333444444444
    18.00        1 .  555555666677888999
    10.00        2 .  1112233444
     6.00        2 .  677788
    27.00 Extremes    (>=.30)

 Stem width:       .10
 Each leaf:        1 case(s)
```

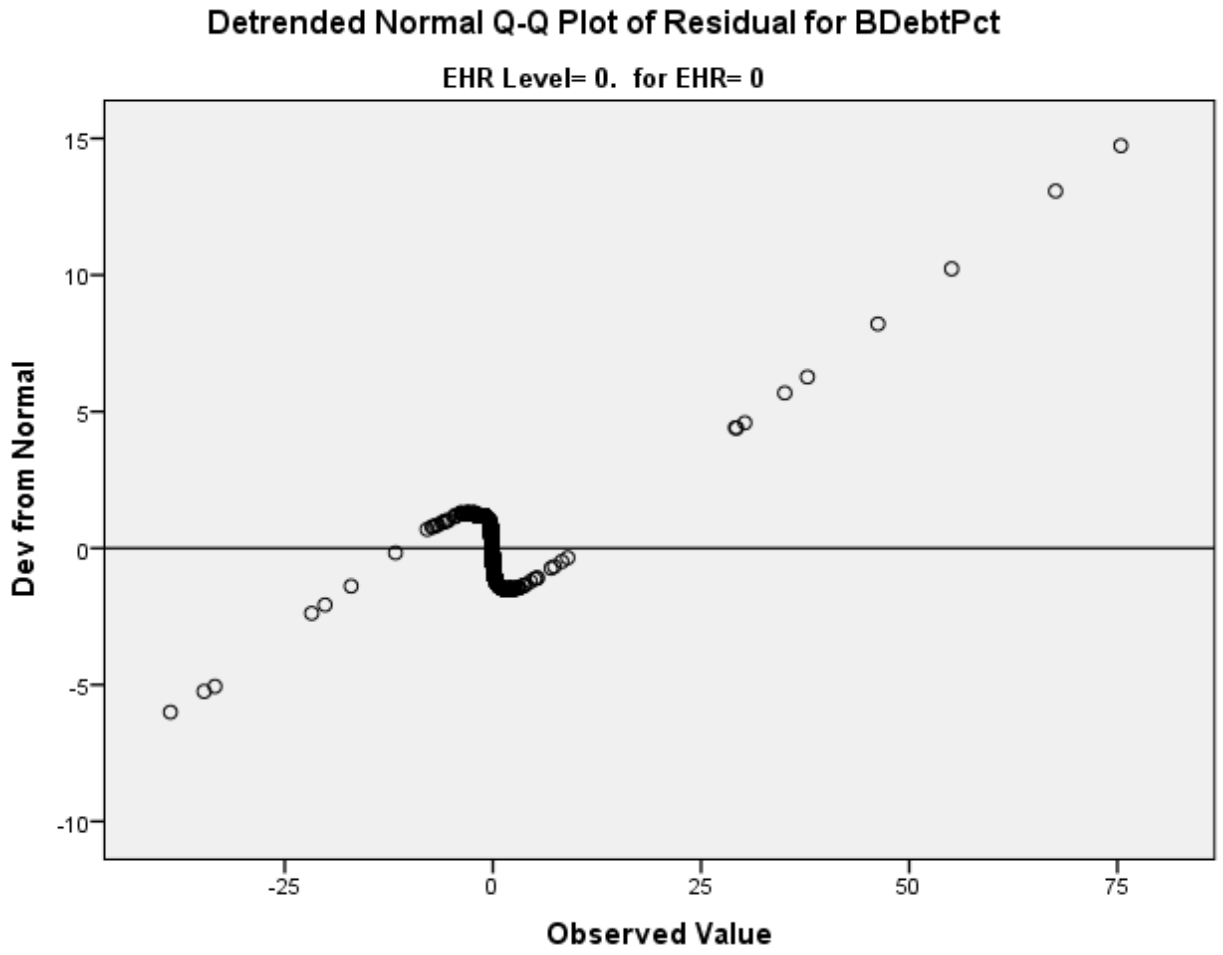
Normal Q-Q Plots

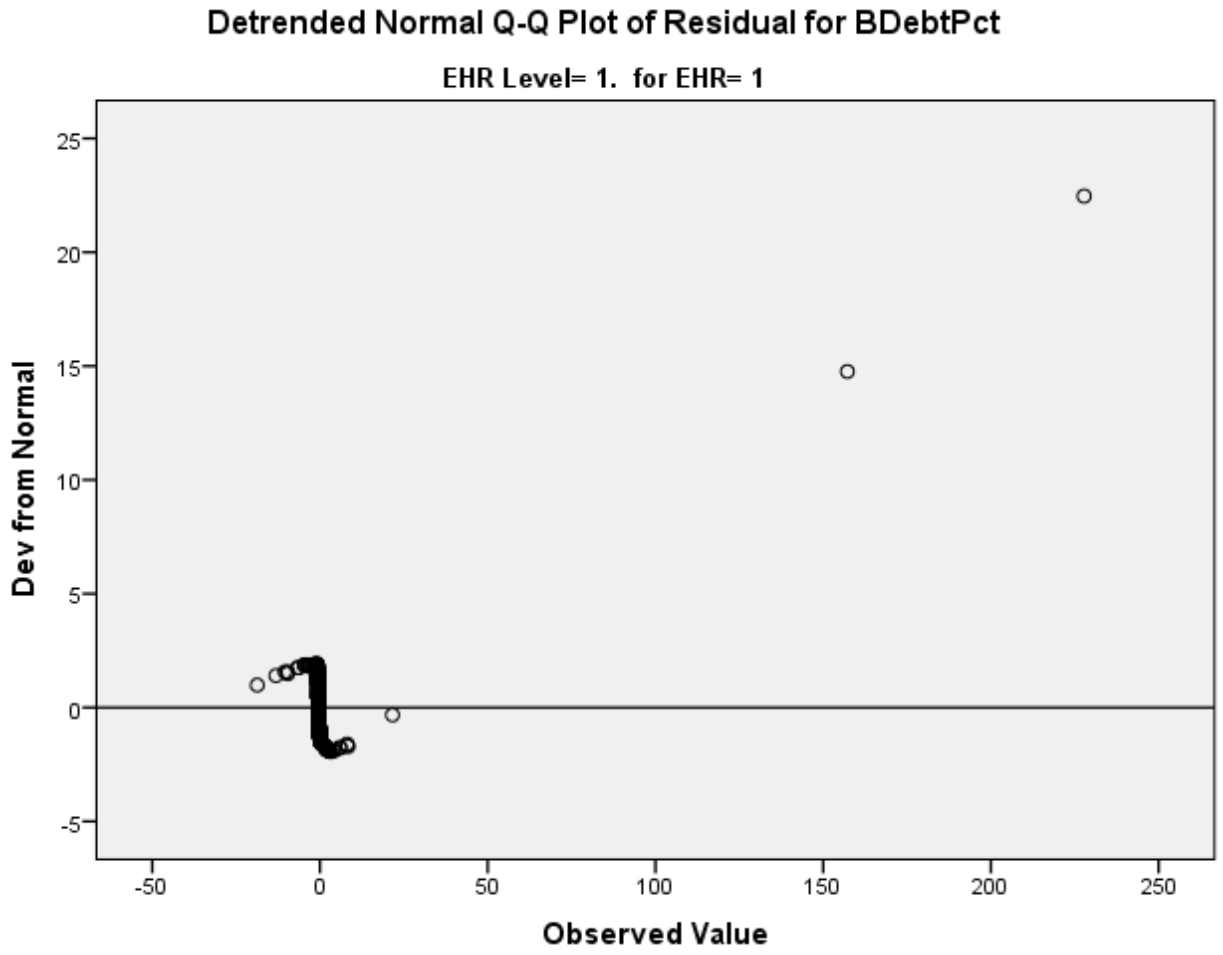


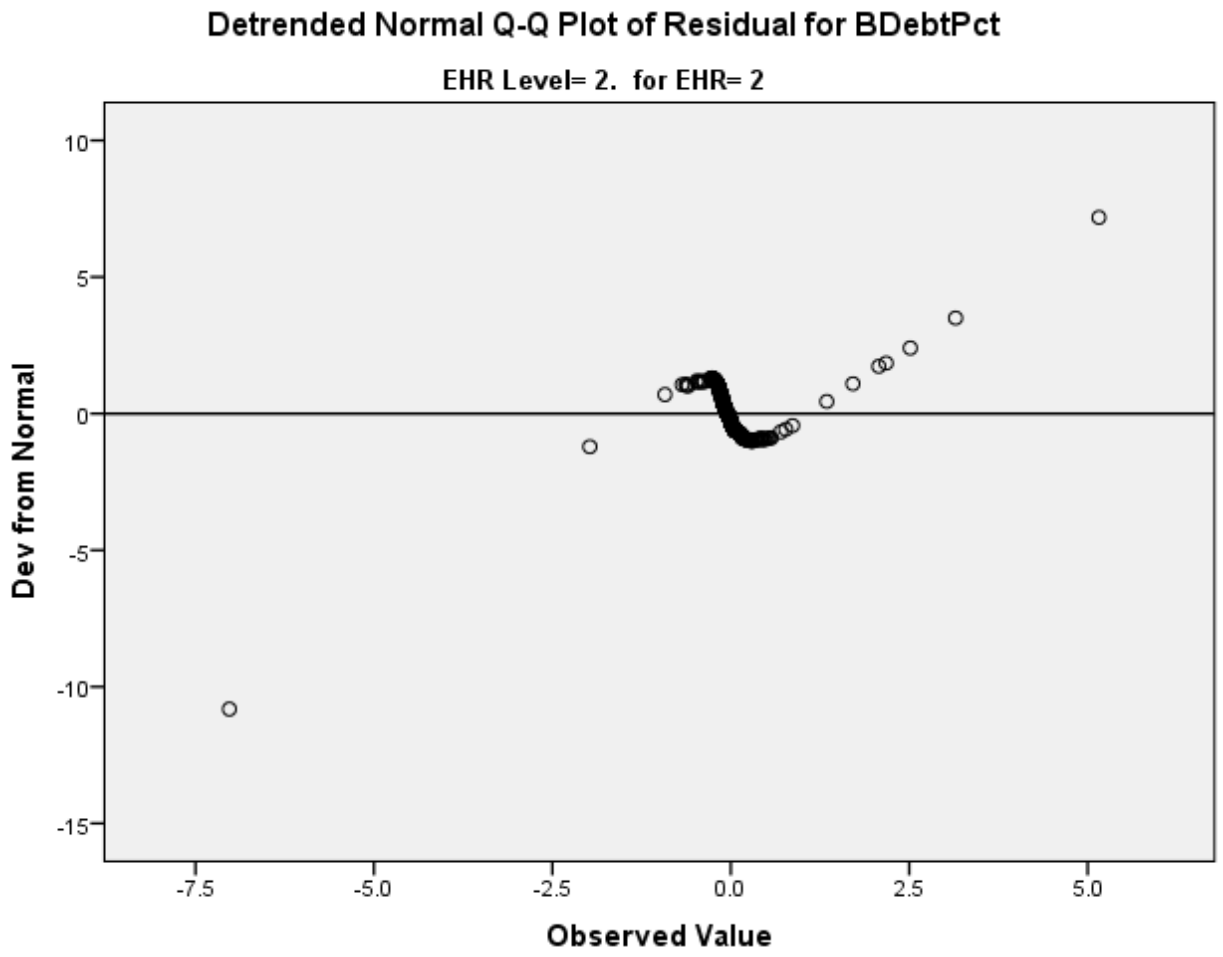

Normal Q-Q Plot of Residual for BDebtPct
EHR Level= 1. for EHR= 1
Expected Normal
Observed Value
30
20
10
0
-10
-50
0
50
100
150
200
250



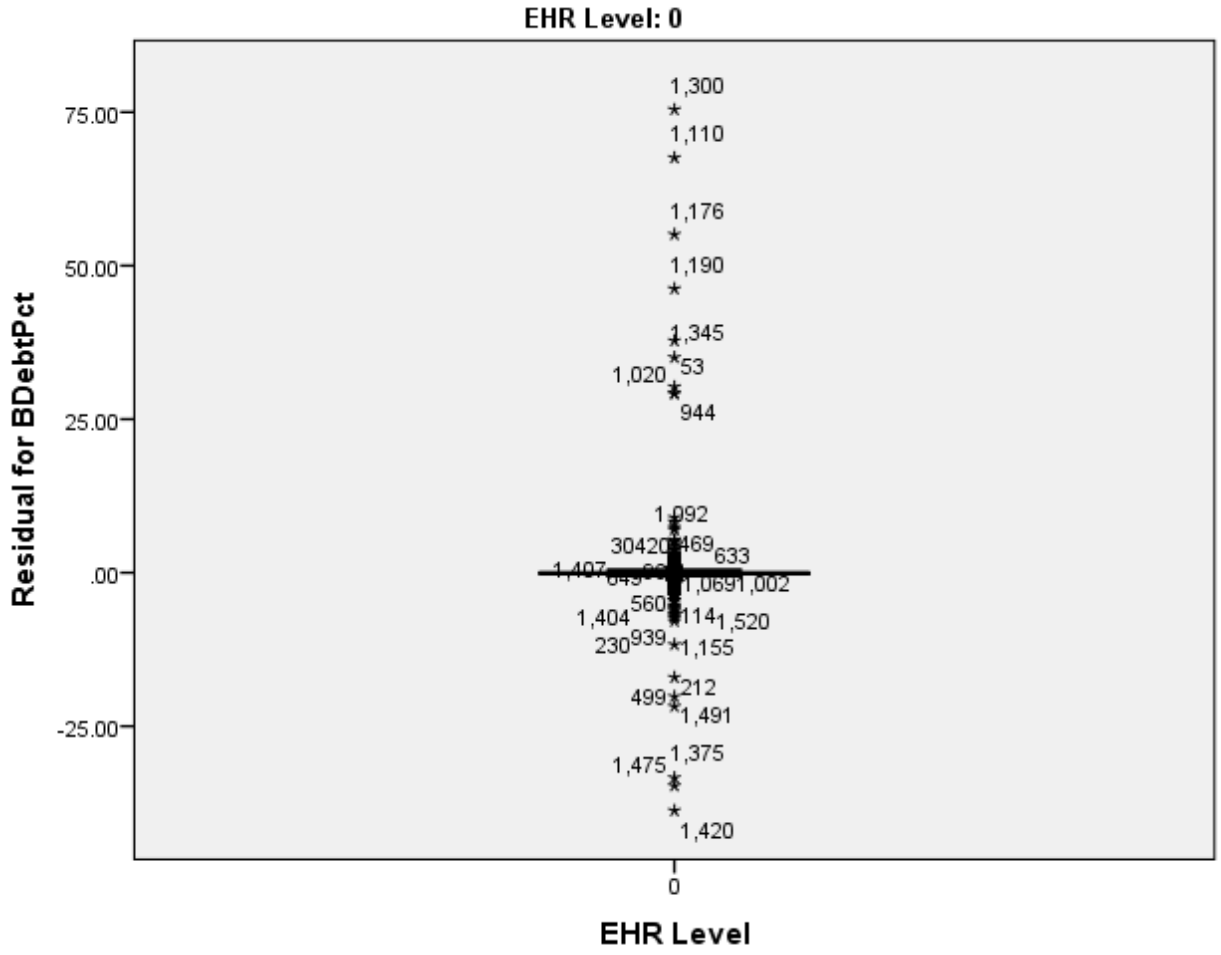
Detrended Normal Q-Q Plots

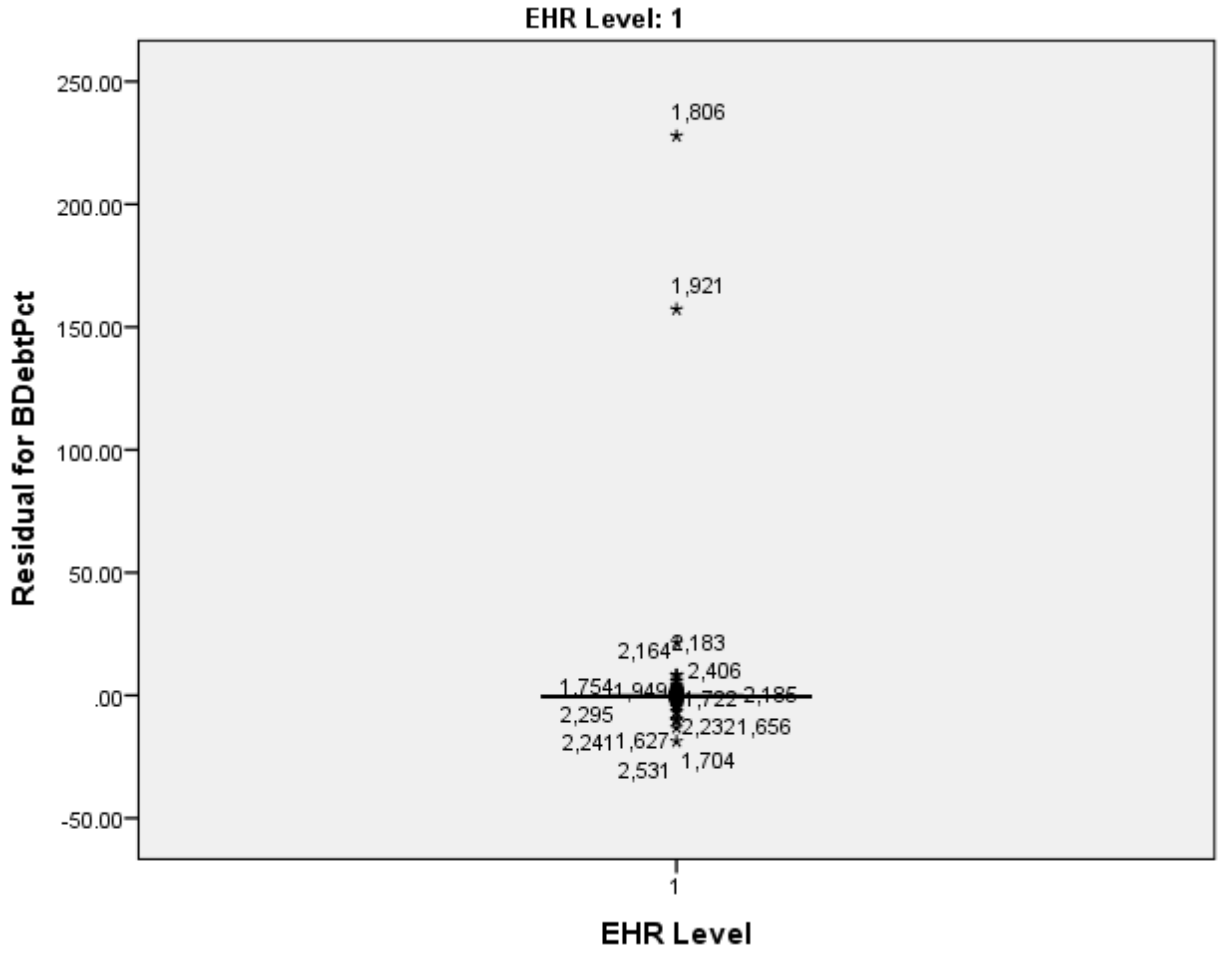

Detrended Normal Q-Q Plot of Residual for BDebtPct
EHR Level= 0. for EHR= 0
Dev from Normal
15
10
5
0
-5
-10
-25
0
25
50
75
Observed Value

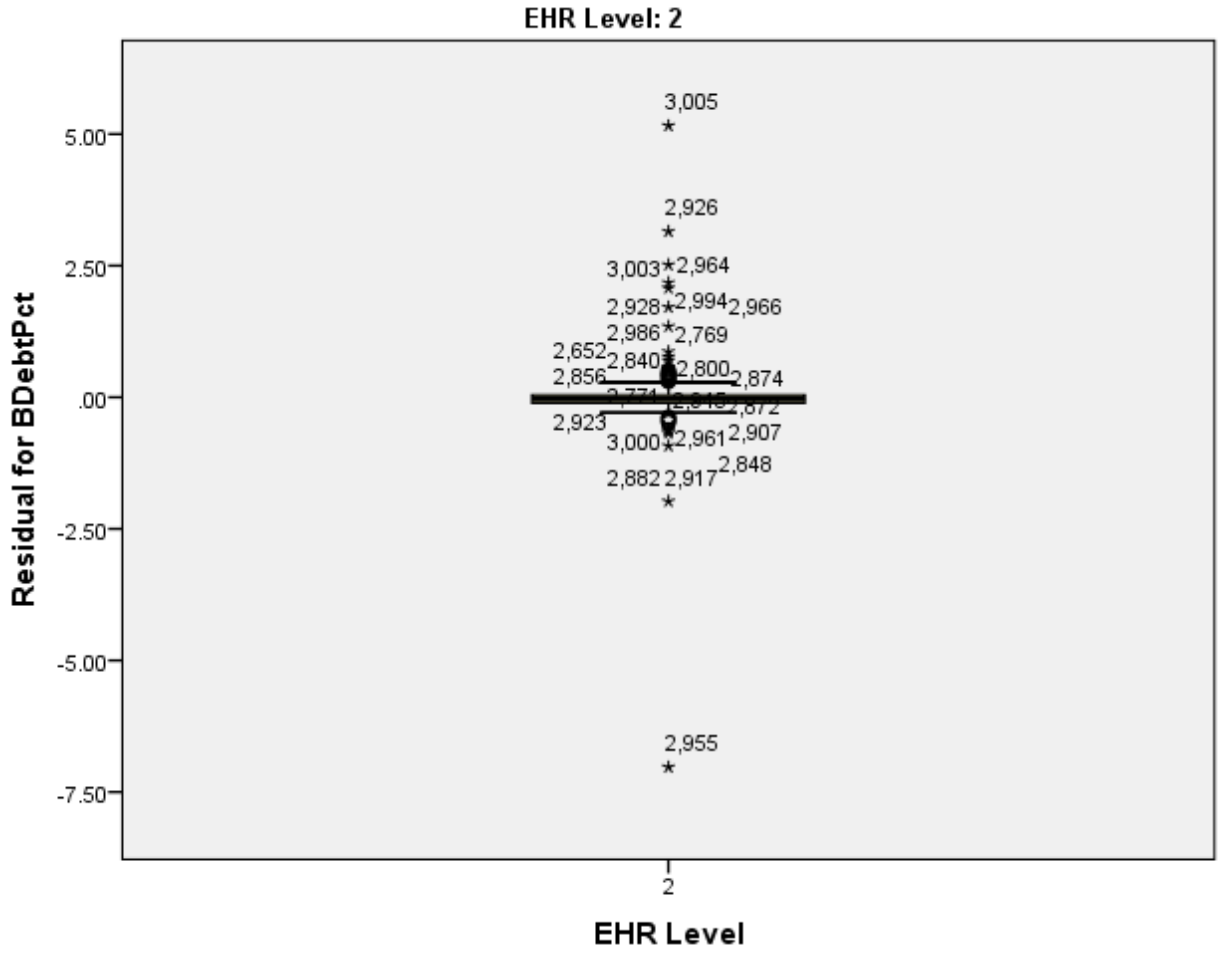

Detrended Normal Q-Q Plot of Residual for BDebtPct
EHR Level= 1. for EHR= 1
Dev from Normal
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
Observed Value


Detrended Normal Q-Q Plot of Residual for BDebtPct
EHR Level= 2. for EHR= 2
Dev from Normal
10
5
0
-5
-10
-15
-7.5
-5.0
-2.5
0.0
2.5
5.0
Observed Value

Boxplots

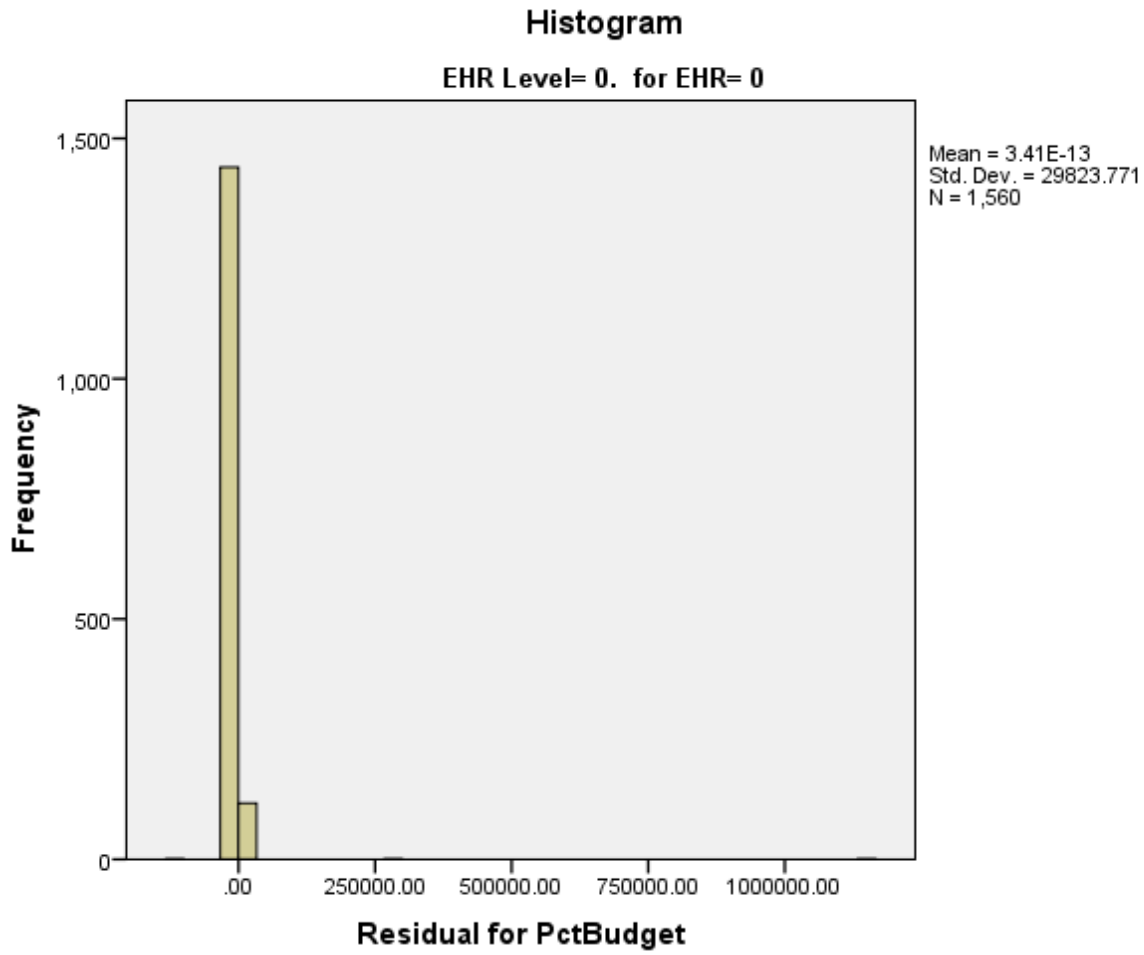

EHR Level: 0
Residual for BDebtPct
75.00
50.00
25.00
.00
-25.00
1,300
1,110
1,176
1,190
1,345
1,020
53
944
1,092
30420
469
633
1,407
1,069
1,002
560
1,404
114
1,520
230
939
1,155
212
499
1,491
1,375
1,475
1,420
0
EHR Level

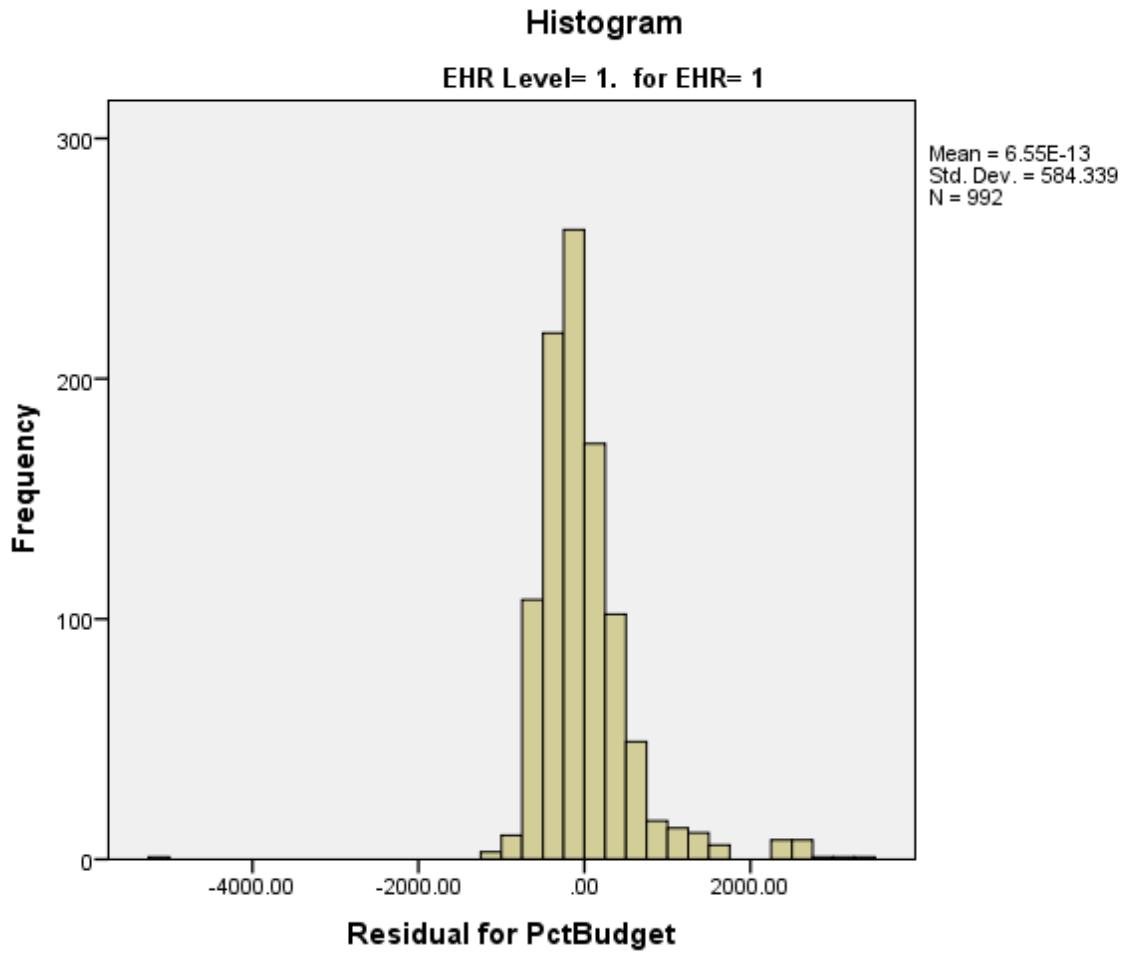

EHR Level: 1
Residual for BDebtPct
250.00
200.00
150.00
100.00
50.00
.00
-50.00
1,806
1,921
2,164
2,183
2,406
1,754
1,949
1,722
2,185
2,295
2,232
1,656
2,241
1,627
2,531
1,704
1
EHR Level

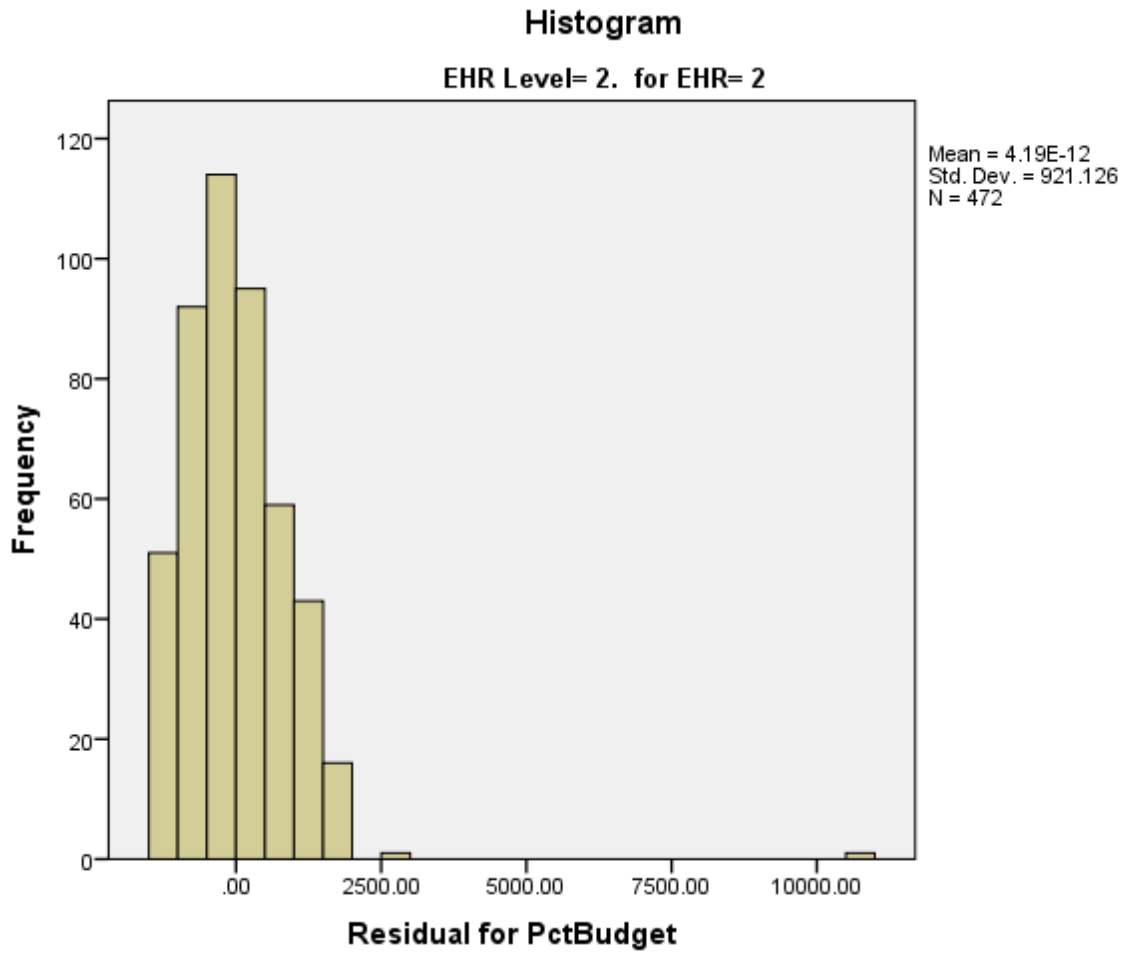


Residual for PctBudget

Histograms


Histogram
EHR Level= 0. for EHR= 0
Mean = 3.41E-13
Std. Dev. = 29823.771
N = 1,560
Frequency
1,500
1,000
500
0
.00
250000.00
500000.00
750000.00
1000000.00
Residual for PctBudget


Histogram
EHR Level= 1. for EHR= 1
Mean = 6.55E-13
Std. Dev. = 584.339
N = 992
Frequency
300
200
100
0
-4000.00
-2000.00
.00
2000.00
Residual for PctBudget



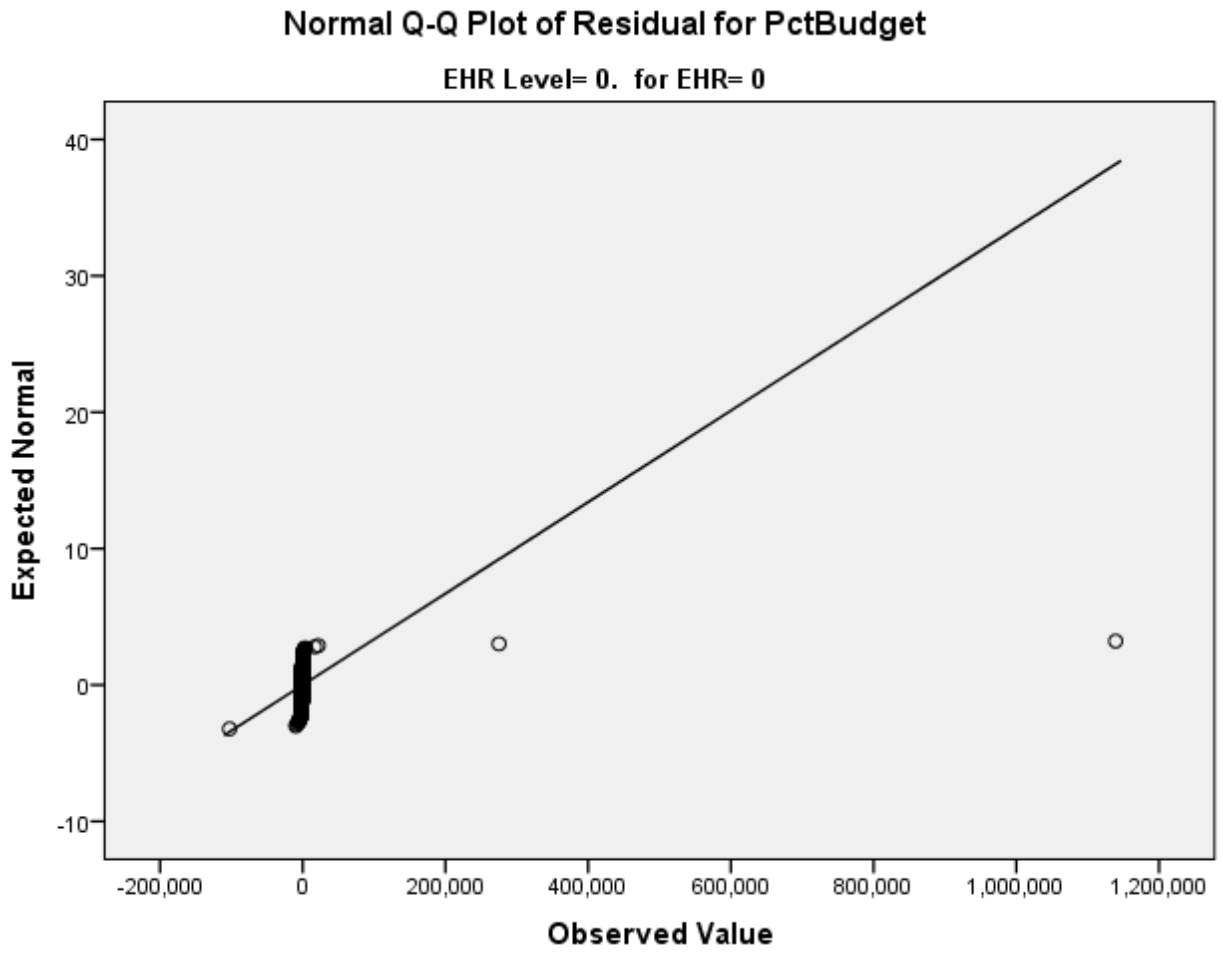
Stem-and-Leaf Plots

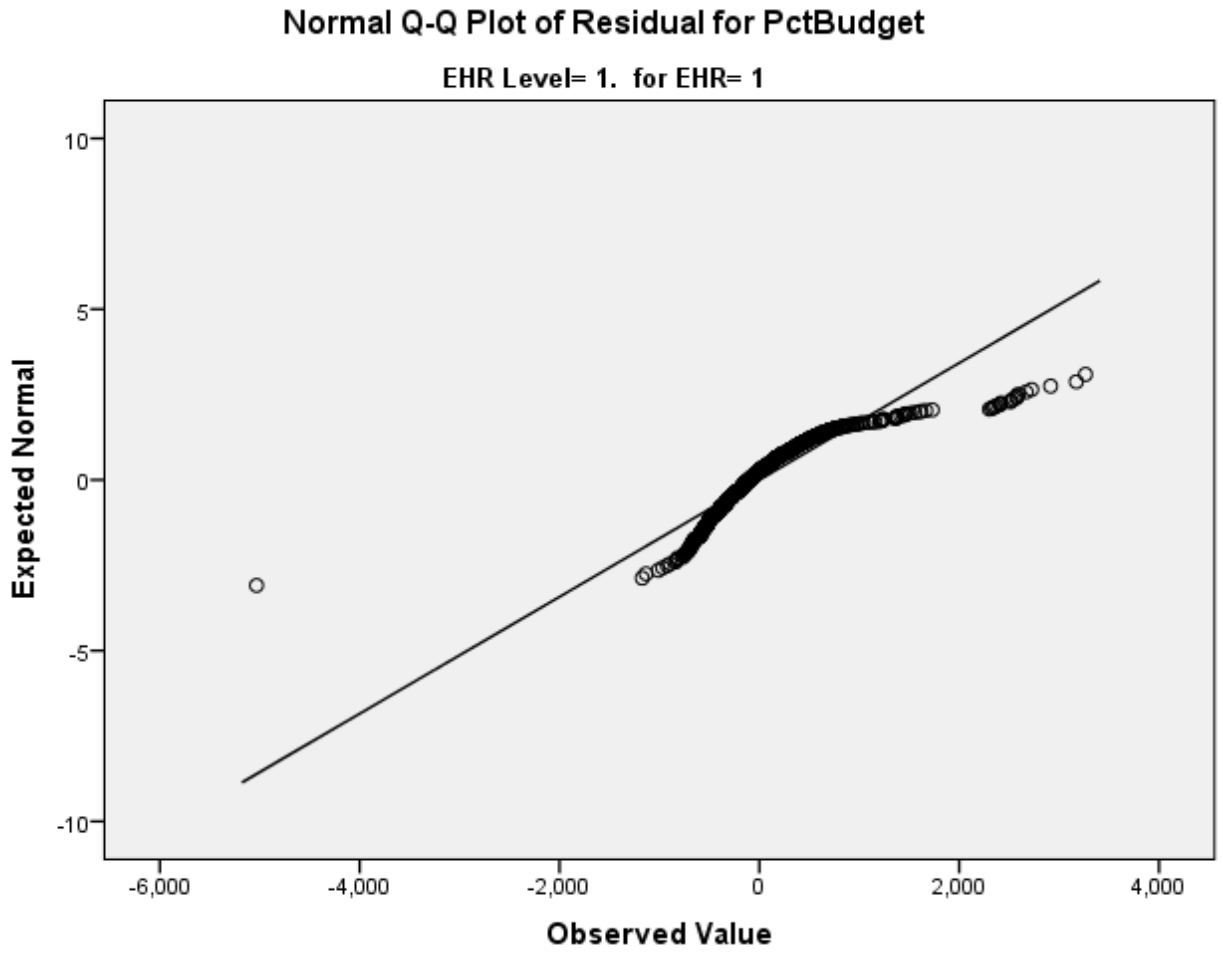
```
Residual for PctBudget Stem-and-Leaf Plot for
EHR= 0
EHR= 0

 Frequency    Stem &  Leaf

    24.00 Extremes    (=<-2292)
     2.00      -22 .  &
     4.00      -21 .  &&
     6.00      -20 .  2&&
     9.00      -19 .  1&&&
```

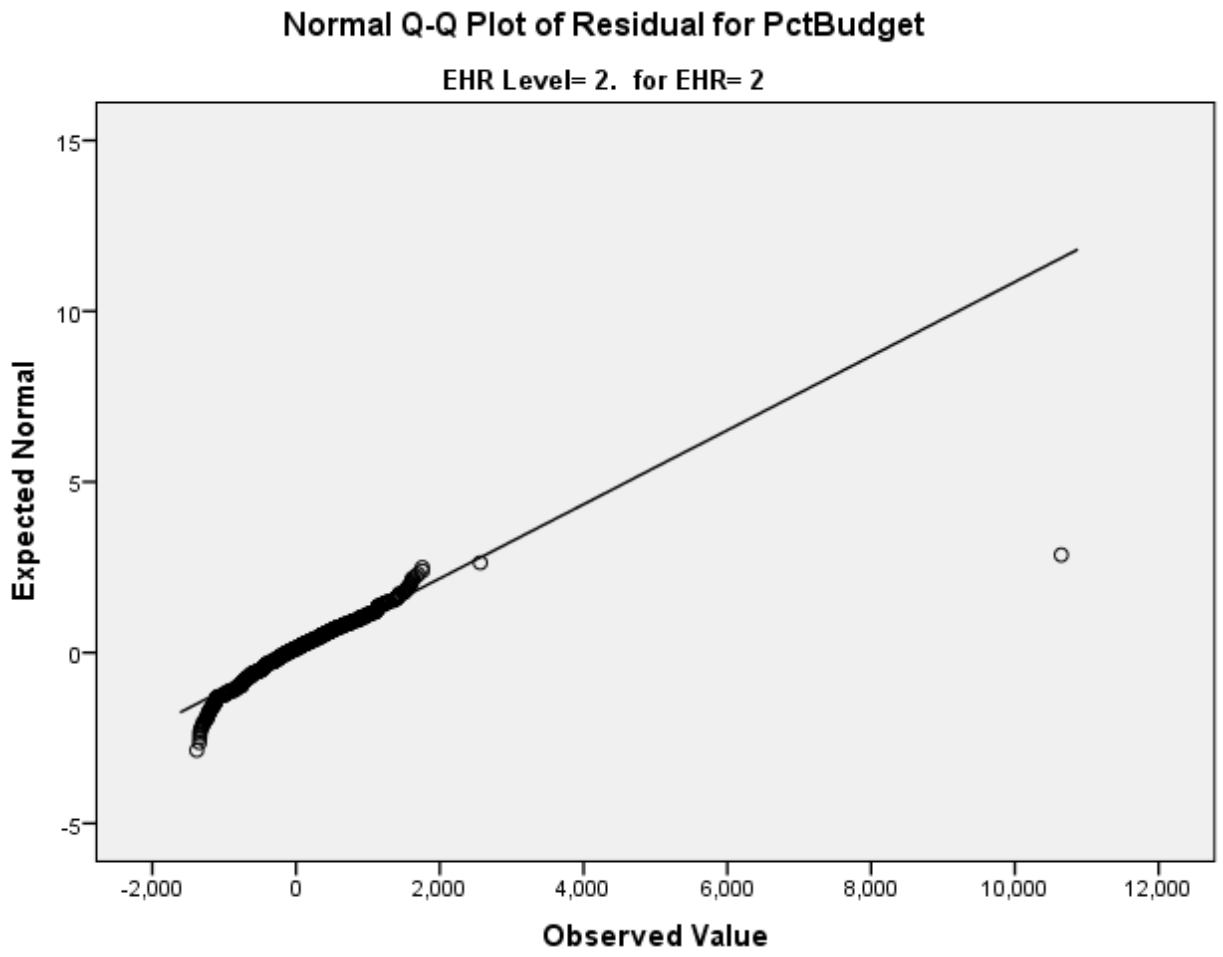
```
     7.00      -18 .  2&&
     7.00      -17 .  25&
    29.00      -16 .  0001233346789&
    41.00      -15 .  0000122344455667899
    59.00      -14 .  00111112233444456678889999
    99.00      -13 .  000111111222222333344455555556666777778888899999
   123.00      -12 .
000000000111111112222223333334444455555666677777778888999999
   134.00      -11 .
00000011111111222222233333444444455555555666666777777788888999999
   142.00      -10 .
000011111222222222222333333444444444455555556666666777777888888999999
   101.00       -9 .  000111111222222233334444445555566666777888899999
   124.00       -8 .
00001111222222223333344444555555666666667777777778888888889999
   114.00       -7 .
0000011112222223333344444445555555666666677778888899999
    74.00       -6 .  000000011122233445556666667778888899
   100.00       -5 .  00001111222223333344445555556666666777888888999
    55.00       -4 .  0011222333334566778899999
    56.00       -3 .  001112223344444556778999
    55.00       -2 .  00011123334445677888999
    45.00       -1 .  0011233334455677789
    31.00       -0 .  0223455578899&
    29.00        0 .  01333566789&
    16.00        1 .  01468&
    10.00        2 .  49&&&
     9.00        3 .  178&
    10.00        4 .  0477&
    45.00 Extremes    (>=500)

 Stem width:    100.00
 Each leaf:        2 case(s)


 & denotes fractional leaves.



Residual for PctBudget Stem-and-Leaf Plot for
EHR= 1
EHR= 1

 Frequency    Stem &  Leaf

     3.00 Extremes    (=<-1133)
     1.00      -10 .  &
     2.00       -9 .  &
     5.00       -8 .  13&
    11.00       -7 .  006&&
    26.00       -6 .  01345666889&
    74.00       -5 .  000000011111222233444446666778888898&
    66.00       -4 .  000011112223333556666778888899&
   103.00       -3 .
```

```
00111111111222222223333344444555666777788889999999
    87.00       -2 .  000001123333344445555566666667777778888999
   118.00       -1 .
0000011112222233333444444455555566666677777788888888999999
   107.00       -0 .
000011111112223333334445555566666677777788899999999
    73.00        0 .  00111122222233344455566677778889999
    74.00        1 .  000000111222233334444455555667888899
    49.00        2 .  0001112223345667788899
    45.00        3 .  0012233344456678899
    34.00        4 .  00112345677899
    22.00        5 .  001234578&
    21.00        6 .  00123689&
     9.00        7 .  347&
     8.00        8 .  36&&
     4.00        9 .  3&
    50.00 Extremes    (>=978)

 Stem width:    100.00
 Each leaf:        2 case(s)



 & denotes fractional leaves.



Residual for PctBudget Stem-and-Leaf Plot for
EHR= 2
EHR= 2

 Frequency    Stem &  Leaf

    20.00       -1 .  22222222222223333333
    31.00       -1 .  000000011111111111111111111111
    24.00       -0 .  88888888888899999999999
    53.00       -0 .
6666666666666666666666666777777777777777777777777777
    45.00       -0 .  44444444444444444444444444444455555555555555555
    46.00       -0 .  22222222222222222222222222233333333333333333333
    38.00       -0 .  00000000000000000111111111111111111111
    40.00        0 .  000000000000000000000000011111111111111
    37.00        0 .  22222222222222222233333333333333333333
    31.00        0 .  44444444444444444455555555555555
    24.00        0 .  666666666666667777777777
    22.00        0 .  8888888888889999999999
    23.00        1 .  000000111111111111111111
    12.00        1 .  222222233333
    17.00        1 .  44444444555555555
     7.00        1 .  6666677
     2.00 Extremes    (>=2563)

 Stem width:   1000.00
 Each leaf:        1 case(s)
```

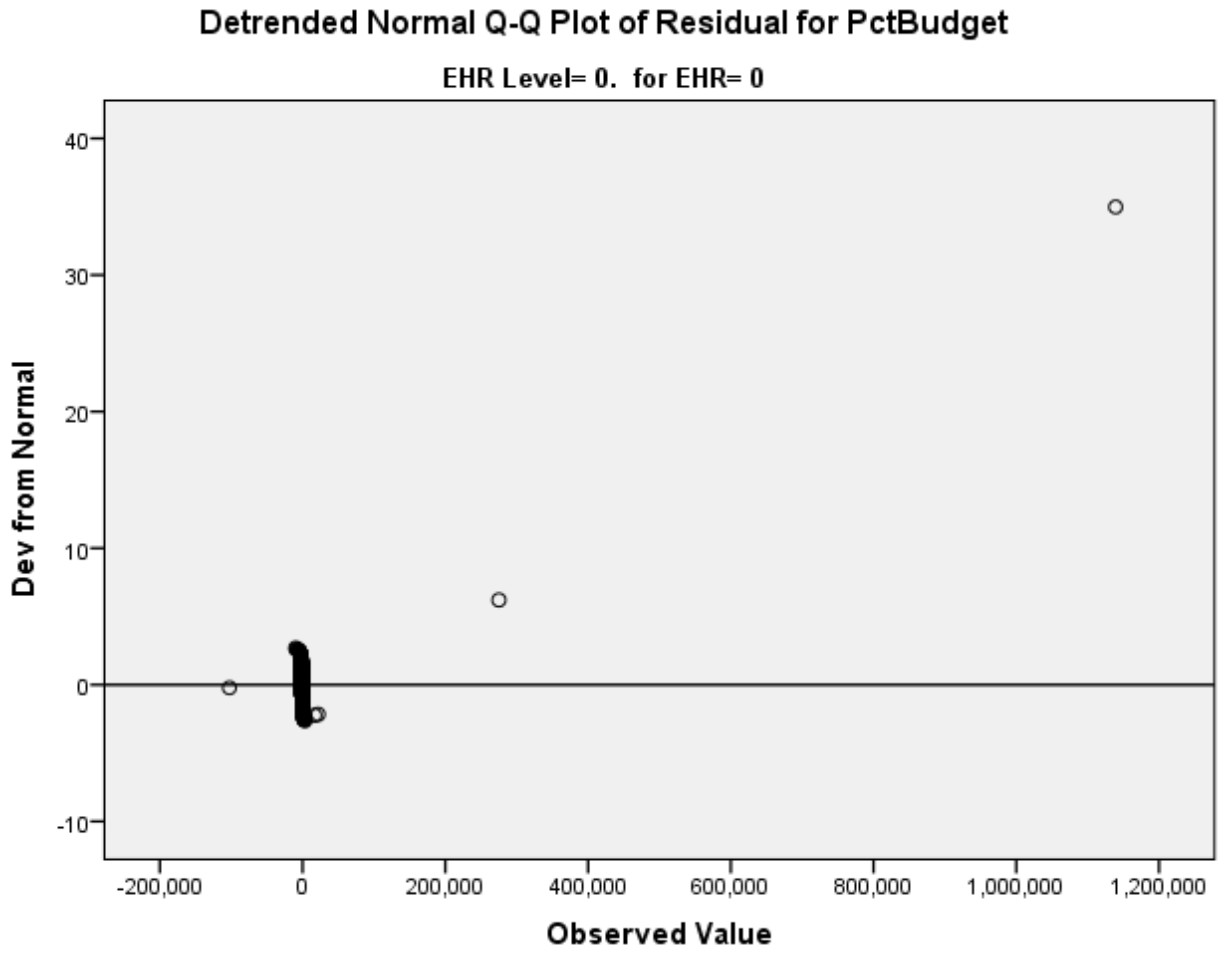
Normal Q-Q Plots

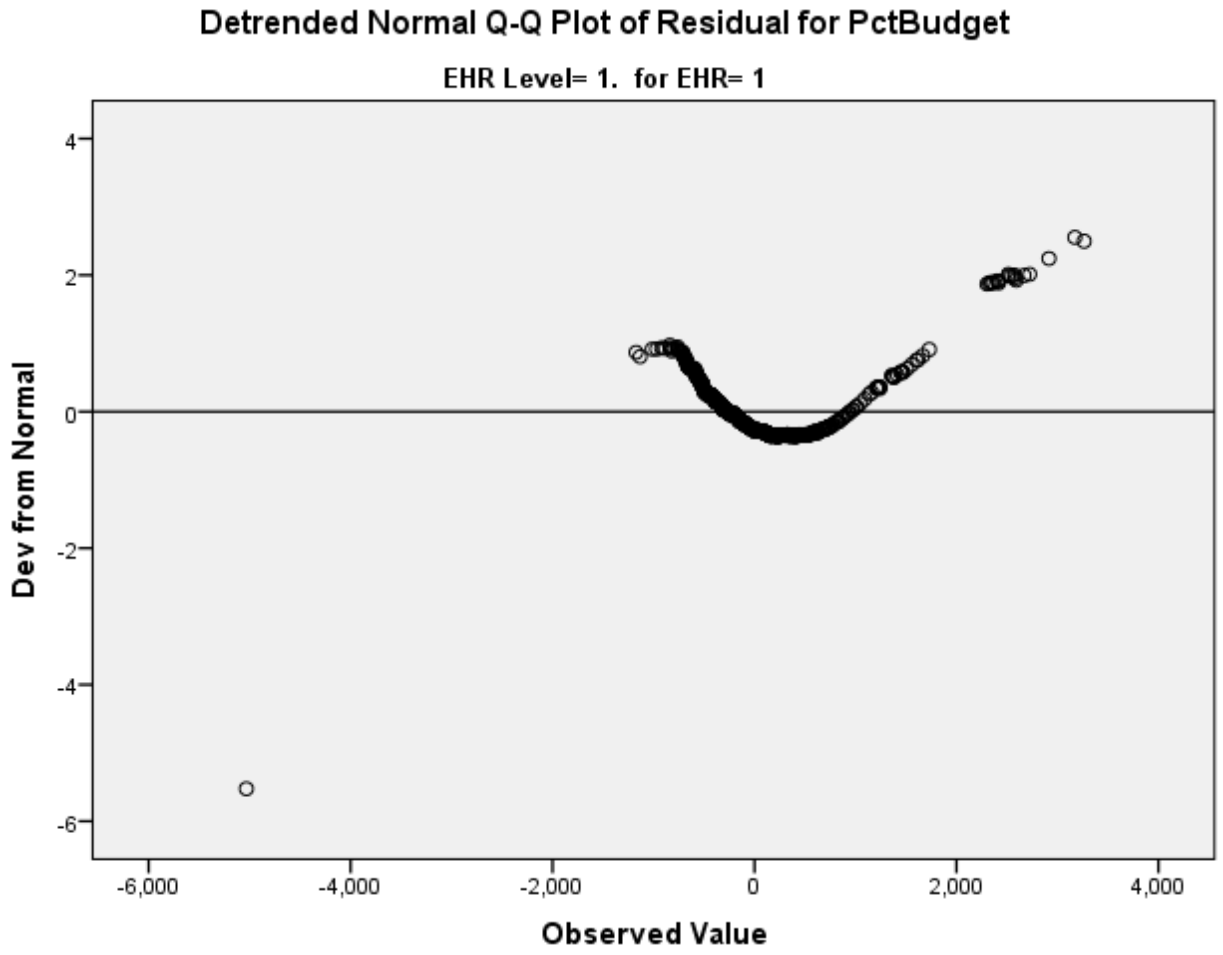


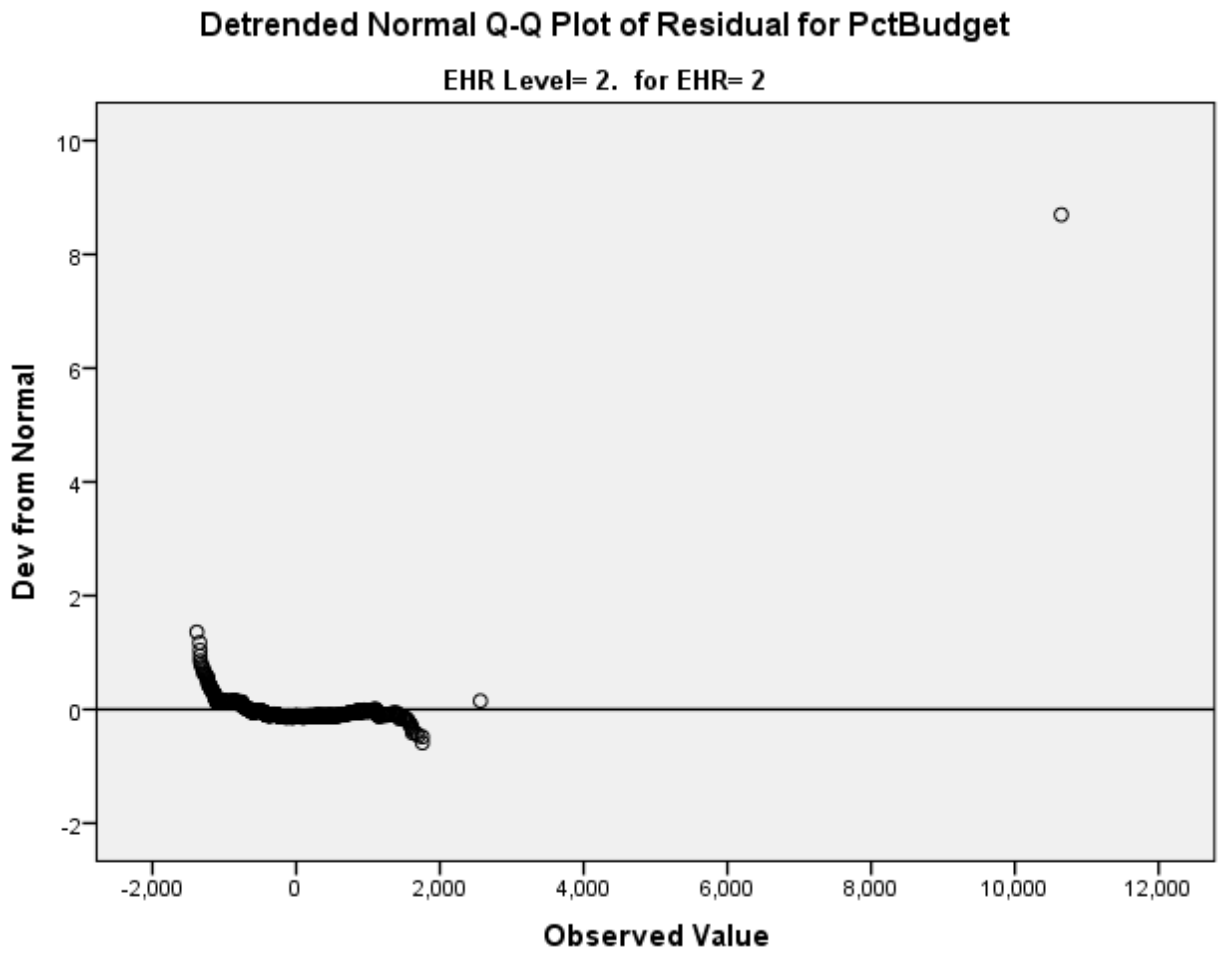

Normal Q-Q Plot of Residual for PctBudget
EHR Level= 1. for EHR= 1
Expected Normal
10
5
0
-5
-10
-6,000
-4,000
-2,000
0
2,000
4,000
Observed Value



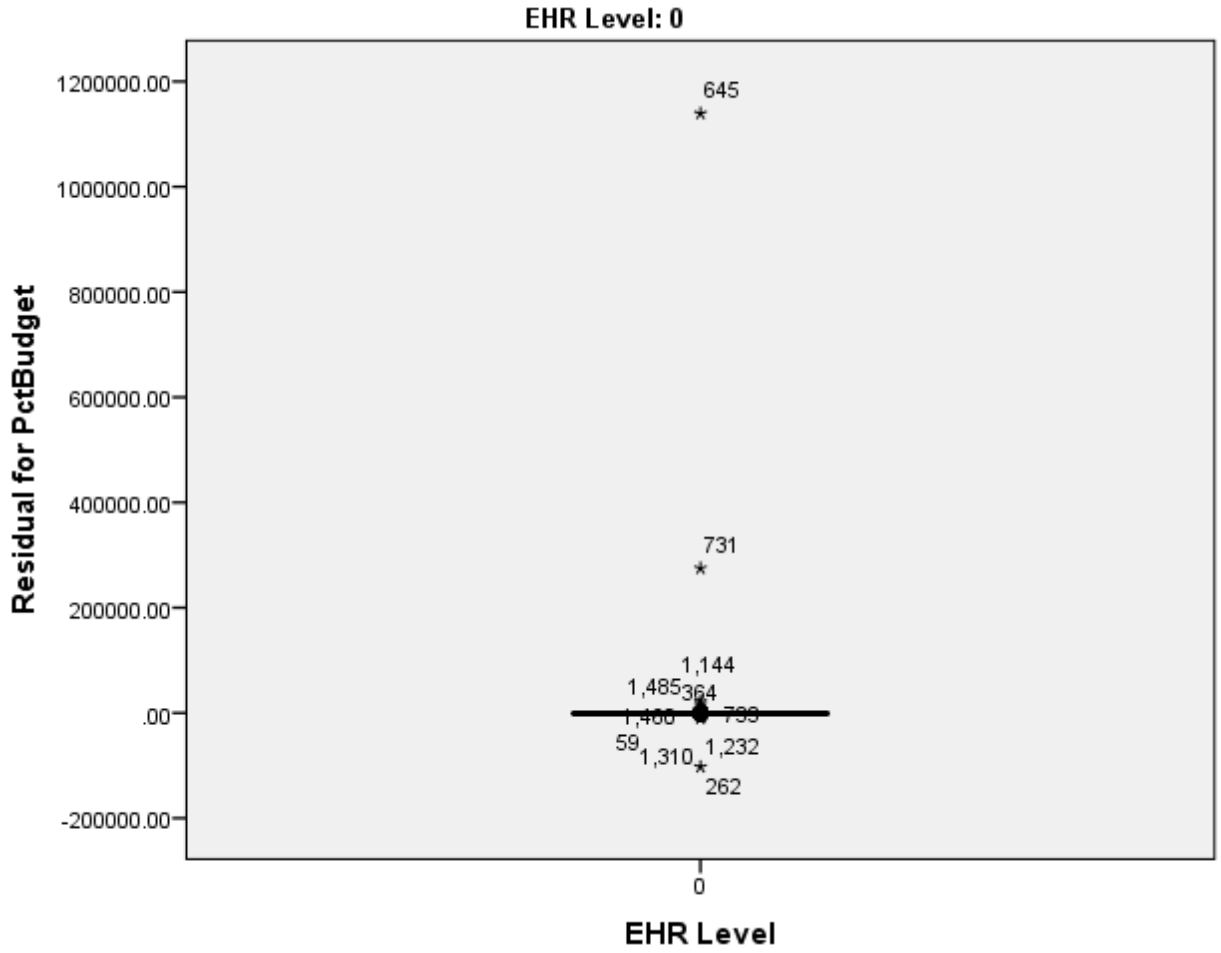
Detrended Normal Q-Q Plots

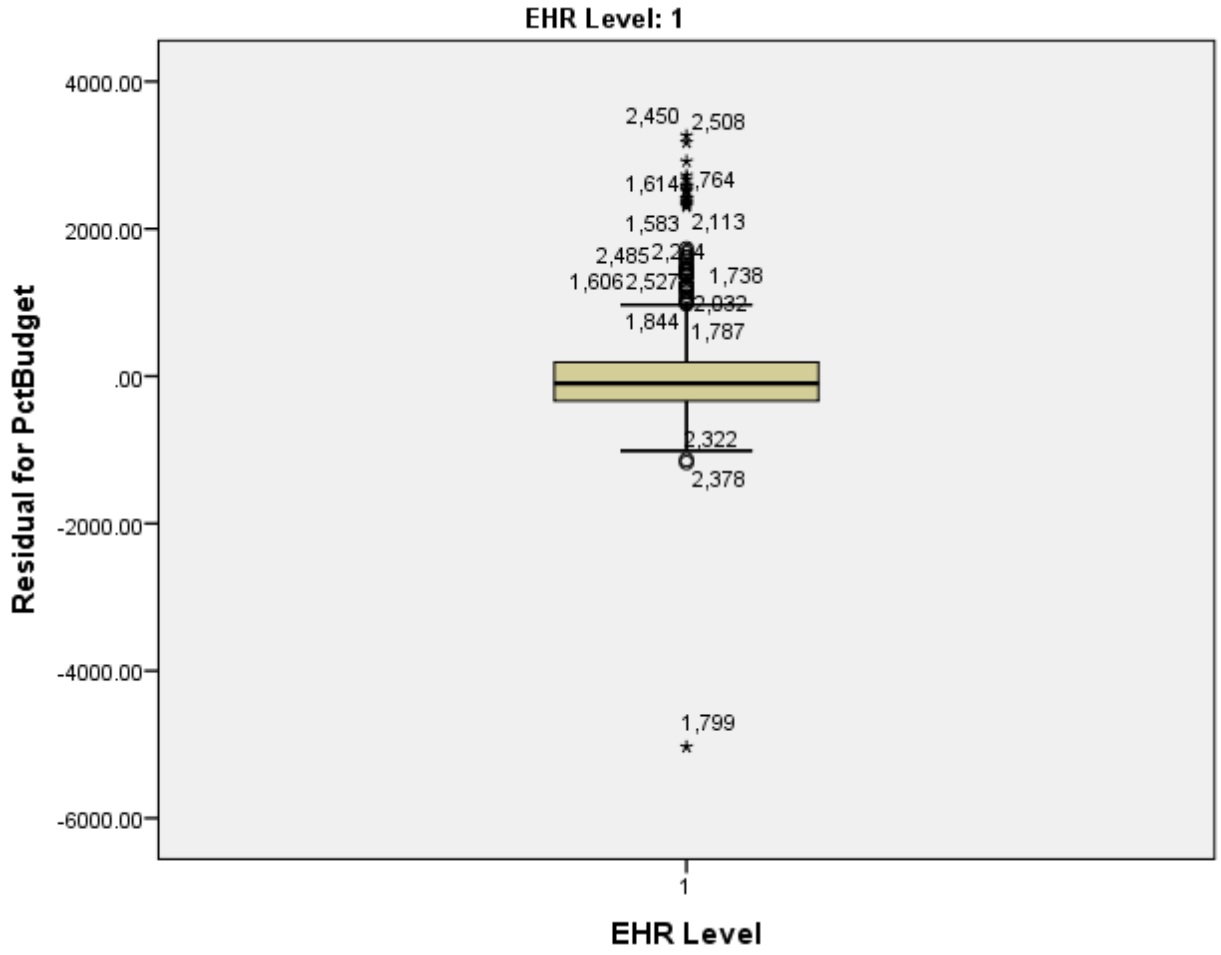

Detrended Normal Q-Q Plot of Residual for PctBudget
EHR Level= 0. for EHR= 0
Dev from Normal
40
30
20
10
0
-10
-200,000
0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
Observed Value

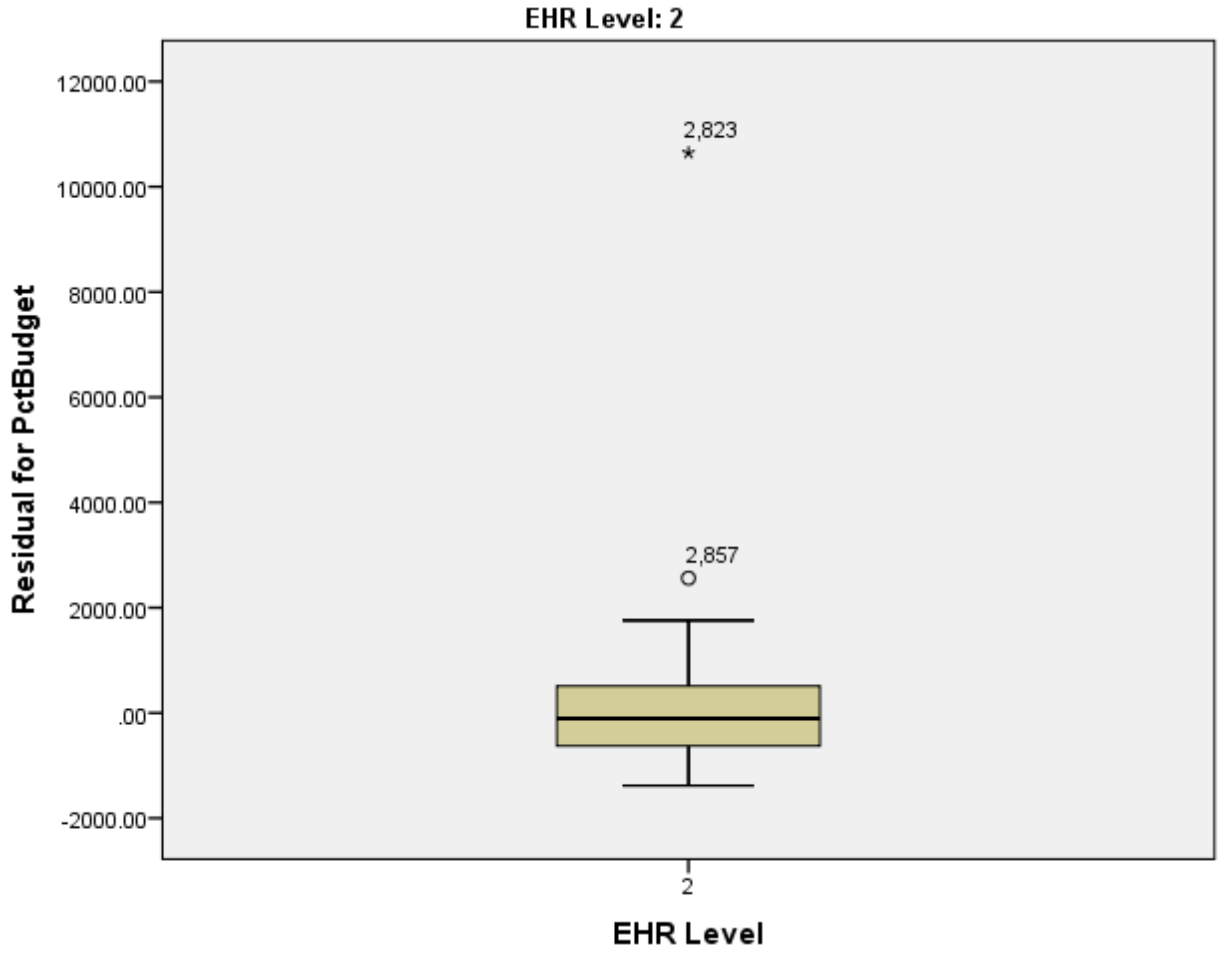

Detrended Normal Q-Q Plot of Residual for PctBudget
EHR Level= 1. for EHR= 1
Dev from Normal
4
2
0
-2
-4
-6
-6,000
-4,000
-2,000
0
2,000
4,000
Observed Value


Detrended Normal Q-Q Plot of Residual for PctBudget
EHR Level= 2. for EHR= 2
Dev from Normal
10
8
6
4
2
0
-2
-2,000
0
2,000
4,000
6,000
8,000
10,000
12,000
Observed Value

Boxplots


EHR Level: 0
Residual for PctBudget
1200000.00
1000000.00
800000.00
600000.00
400000.00
200000.00
.00
-200000.00
645
731
1,144
1,485
364
1,480
799
59
1,310
1,232
262
0
EHR Level


EHR Level: 1
Residual for PctBudget
4000.00
2000.00
.00
-2000.00
-4000.00
-6000.00
2,450
2,508
1,764
1,583
2,113
2,485
1,606
2,527
1,738
2,032
1,844
1,787
2,322
2,378
1,799
1
EHR Level




```
SPLIT FILE OFF.

SAVE OUTFILE='C:\Users\Scott H\Documents\A Dissertation
SLH\Analysis\Final '+
    'Analysis\Jan2016-June2017Final Data Set-3wResiduals-unSplit.sav'
  /COMPRESSED.
SORT CASES BY MAH_1(D).


SORT CASES BY Facility(A).
SORT CASES BY AsOfDate(A) Facility(A).
GENLOG FailedRevtIndicator WITH SkilledPctMix
  /GLOR=EHR
  /MODEL=POISSON
  /PRINT=FREQ RESID ADJRESID ZRESID DEV
  /PLOT=RESID(ADJRESID) NORMPROB(ADJRESID)
  /CRITERIA=CIN(95) ITERATE(20) CONVERGE(0.001) DELTA(.5)
  /DESIGN FailedRevtIndicator SkilledPctMix.
```

General Loglinear

Notes

Output Created		07-OCT-2017 15:29:40
Comments		
Input	Data	C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-3wResiduals-unSplitEOD.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	3024
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.
Syntax		GENLOG FailedRevtIndicator WITH SkilledPctMix /GLOR=EHR /MODEL=POISSON /PRINT=FREQ RESID ADJRESID ZRESID DEV /PLOT=RESID(ADJRESID) NORMPROB(ADJRESID) /CRITERIA=CIN(95) ITERATE(20) CONVERGE(0.001) DELTA(.5) /DESIGN FailedRevtIndicator SkilledPctMix.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

[DataSet1] C:\Users\Scott H\Documents\A Dissertation SLH\Analysis\Final Analysis\Jan2016-June2017Final Data Set-3wResiduals-unSplitEOD.sav

Warnings

All residuals are zero under the model. Therefore the requested charts will not be created.

Data Information

		N
Cases	Valid	3024
	Missing	0
	Weighted Valid	3024
Cells	Defined Cells	2
	Structural Zeros	0
	Sampling Zeros	0
Categories	Failed Revisit	2

Convergence Information[a,b]

Maximum Number of Iterations	20
Converge Tolerance	.00100
Final Maximum Absolute Difference	8.17126E-6[c]
Final Maximum Relative Difference	3.10771E-6
Number of Iterations	6

a. Model: Poisson

b. Design: Constant + FailedRevtIndicator + SkilledPctMix

c. The iteration converged because the maximum absolute changes of parameter estimates is less than the specified convergence criterion.

Goodness-of-Fit Tests[a,b]

	Value	df	Sig.

Likelihood Ratio	.000	0	.
Pearson Chi-Square	.000	0	.

a. Model: Poisson

b. Design: Constant + FailedRevtIndicator + SkilledPctMix

Cell Counts and Residuals[a,b]

		Observed		Expected			Standardized
Failed	Revisit	Count	%	Count	%	Residual	Residual
0		2821.500	93.3%	2821.500	93.3%	.000	.000
1		203.500	6.7%	203.500	6.7%	.000	.000

Cell Counts and Residuals[a,b]

Failed	Revisit	Adjusted Residual	Deviance
0		.000	.000
1		.000	.000

a. Model: Poisson

b. Design: Constant + FailedRevtIndicator + SkilledPctMix

Generalized Log Odds

Coefficients[b,c]

Failed	Revisit	EHR Level[a]
0		1
1		1

a. Sum of the coefficients is not zero. The generalized log-odds ratio is not computed.

b. Model: Poisson

c. Design: Constant + FailedRevtIndicator + SkilledPctMix

Appendix 5

Data Table- Variables and Labels

Data Table

Variable Name	Type	Lable	Measure
AsOfDate	Date	Month Ending Date	Scale
Facility	Numeric	Facility Identifier	Scale
Region	String	Region	Nominal
Division	String	Division	Nominal
EHR	Numeric	EHR Level	Nominal
BDebtPct	Numeric	Bad Debt %	Scale
BadDebt	Numeric	Bad Debt $	Scale
PctOT	Percent	Over Time %	Scale
ADCPct	Percent	Average Daily Census %	Scale
SkilledPctMix	Percent	% Skilled Patients	Scale
PctBudget	Percent	Revenue % of Budget	Scale
FiveStarQuality	Numeric	CMS 5 Star Quality	Nominal
BedCount	Numeric	Beds in Facility	Scale
Engaged	Percent	Emplyee Engagement Score	Scale
TotalTagsCombined	Numeric	Total Tags	Scale
TotalTagsComplaintOnly	Numeric	Total Complaint Tags	Scale
ComplaintTagPCT	Percent	Complaint Tags %	Scale
FiveStarAll	Numeric	CMS 5 Star	Nominal
FailedRevtIndicator	Numeric	Failed Revisit	Nominal
Complaints	Numeric	Complaints Filed	Scale
FacilityDefIndex	Numeric	Facility Defficiency Index	Scale
TotalRTH	Numeric	Return to Hospital	Scale
TotalAcuteAdmPopIn	Numeric	Total Acute Adm PopIn	Scale
RTHPCT	Percent	Return to Hospital %	Scale
StaffRetRate	Numeric	Staff Retention Rate	Scale
TotTurnoverPct	Numeric	Total Staff Turnover %	Scale
ComplaintTag	Numeric	Complaint Tags Factor	Nominal
HIT	Numeric	Health IT	Nominal