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Abstract

It is important to examine the likelihood of being offered an appointment in 2017 compared to 2019 because of the previous disparities found by other researchers, and because of the events surrounding the ACA in 2017. The results from the data and subsequent analysis using mean, t-tests, and linear regression analysis on the question of change in availability of appointments in 2017 compared to 2019 and wait times in days for appointments for both years yielded mixed yet interesting results. Hispanic females with private insurance were offered appointments more often in 2017 which was statistically significant compared to 2019 where the results were more statistically insignificant. Given the results we cannot reject the global null hypothesis that care either got better or worsened. As for wait times the averages showed that the wait to appointments in days decreased by 2.9 days approximately from 2017 to 2019

Change in Availability Over time

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**Changes in Availability to Healthcare Over Time 2017/2019**

**Introduction**

It is important to examine the likelihood of being offered an appointment in 2017 compared to 2019 because of the previous disparities found by other researchers, and because of the events surrounding the ACA in 2017. According to Sharma, Mitra and Stano, Medicaid the option that insures lower income individuals had a lesser chance of being offered an appointment as opposed to Medicare and the privately insured. (Sharma, Mitra, Stano, 2015). Rich Daly details the problems with the ACA heading into 2017, and the uncertainty that was caused at the time from the surprise election of Donald Trump. Daly informs us that, “Although the marketplaces have been plagued by spiraling premiums heading into 2017 and by the departure of many insurers amid steep losses, the remaining participants have learned much about their enrollees over the past three years.” (Daly, 2016). Uncertainty will be one of the main indicators of disruption in the insurance and healthcare marketplace according to Daly and Ceci Connolly president of the Alliance of Community Health Plans. (Daly, 2016).

Further research on access to care and health by Dr. Sarah Miller and Dr. Laura Wherry found, However, as compared with no expansion states, expansion states had a decrease in reports of inability to afford needed follow-up care (difference-in-differences estimate, −3.4 percentage points; P=0.002) and in reports of worry about paying medical bills (difference-in-differences estimate, −7.9 percentage points; P=0.002) and an increase in reports of medical care being delayed because of wait times for appointments (difference-in-differences estimate, 2.6 percentage points; P=0.02). (Miller, Wherry, 2017). Researchers Dahai Yue, Petra Rasmussen and Ninez Ponce found disparities in the ACA expansion from 2013-2015 in their paper, ‘Racial/Ethnic Differential Effects of Medicaid Expansion on Healthcare Access (Yue, et al. 2018). In their findings Yue, Rasmussen and Ponce found, “Among the low-income, nonelderly adults, Medicaid expansion was associated with statistically significant gains in [health insurance](https://go-gale-com.proxy.lib.pdx.edu/ps/i.do?p=GPS&u=s1185784&id=GALE%7CA558542160&v=2.1&it=r) coverage, having personal doctors, and affordability. Hispanics got the fewest benefits, which significantly widened racial/ethnic disparities for the Hispanic group. Racial/ethnic disparity in having personal doctors narrowed for non-Hispanic black and non-Hispanic others, although not statistically significant.” (Yue, et al, 2018). Disparities were found to exist within the subdivided groups who would’ve benefitted the ACA’s Medicaid expansion, this leads to the question of is there any disparities in appointments offered between 2017 and 2019. Brandon Soloner, et. al. examined wait-times to appointment for community-based health centers between 2012/2013 and again in 2016 to measure whether the ACA had any impact on wait-times for appointments. According to Soloner and the other researchers, “In both rounds, [Medicaid](https://go-gale-com.proxy.lib.pdx.edu/ps/i.do?p=GPS&u=s1185784&id=GALE|A574566622&v=2.1&it=r) and uninsured callers had higher appointment rates at CHC than non-CHCs. CHC appointment rates significantly increased between 2012/2013 and 2016 for both employer-sponsored and Medicaid callers, with no significant wait time changes. Appointment rates increased (13.5% points, P < 0.001) and wait times decreased (-5.7 days, P = 0.017) at CHCs relative to non-CHCs for employer-sponsored insurance.” (Soloner et al. 2019).

Research by Héctor Alcalá and others shows interesting results regarding California’s expansion in 2014 and 2015 and access to primary care. Alcalá and the others found “Findings showed poorer access to providers among those insured through Medicaid and the individual market (whether purchased through the state’s health insurance exchange or off-exchange) relative to employer-based insurance. Poor access to primary care providers was seen among private coverage purchased via exchanges, relative to private coverage purchased on the individual market.” (Alcalá, et al. 2018.)

To examine the question of change in availability over time comparing 2017 and 2019, data consisting of 348 call logs conducted by student researchers in a research audit for appointment availability will be analyzed. Of the calls made in 2019, 130 were offered appointments in both 2017 and 2019 together. This was found by creating a variable for successful calls in 2019 and successful calls in 2017. To examine the wait to appointments in days I examined the average number of days in 2017 that were given to a patient and the average number of days given to patients in 2019.

Using regression models and t-tests, females were separated into more specific categories to see the effect on appointment between 2017 and 2019. 60% of appointment offers fell into the call year 2017 category with roughly 39% made in call year 2019. This would not be enough to establish any kind of pattern hence why females were subcategorized into more highly specific individual classifications.

**Results**

Table 1 and table 2 demonstrate the average days spent waiting for an appointment that was offered, 2017 for table 1, and 2019 for table 2. Using wait to appointment as the variable and the successful appointments offered in both 2017 and 2019 as their own variables, the results from table 1 and table 2 were yielded respectively. Table 9 and Table 10 were able to confirm the results that were previously shown in Table 1 and Table 2 respectively showing a decrease in wait to appointments in from 2017 to 2019 by roughly 2.9 days.

Using linear regression and subdividing females into smaller groups, it was found that Hispanic females with private insurance were offered appointment at much higher rates in 2017 compared to 2019 with the result being significant but not statistically significant. T-tests measuring the wait to appointment times yielded a wait time of approximately 29.6 days for calls that were offered an appointment in 2017 and 26.7 days for call offered an appointment in 2019. In 2019 the statistical significance with Hispanic females in the previously mentioned category seems to all but disappear. Regression analysis done on the appointment wait-times for the females divided into the subcategories resulted in Hispanic females with private insurance having linger wait times, however the result is not statistically significant so it cannot be definitely said that they do suffer longer wait times to appointments. Table 3 and table 4 features categories of patients that were offered appointments in 2017 using the appointments that were offered as the variable being studied. Hispanic females with private insurance yielded statistically significant results in being offered an appointment roughly 53.7% of calls offered, with a Pr> |t|=.009. Table 5 and table 6 shows that when analyzed for the appointments offered in 2019, the same results did not yield statistically significant results for Hispanic females with private insurance. Table 4 shows appointments offered in 2017 set as the variable being studied by the separate female patients. It shows of appointments offered in 2017 at 22%, black females were offered at roughly 16% while white females were offered at 20% however those results were not statistically significant. Hispanic females were offered appointments roughly 34% of the time with it being the closest to statistically significant however, it failed to reach that metric. Table 6 shows the same calculation made however with appointments offered in 2019 using the variable I created by multiplying appointments offered\*call year 2019. The results show that of the appointments offered in 2019, none of the categories had any statistically significant results worthy of mentioning. Overall, these tables show that using the linear regression model from SAS yields results showing Hispanic females with private insurance were at a disadvantage in 2017 compared to black females and white females of similar categories, in 2019 the results were statistically insignificant to determine whether that effect was short term or long term.

Table 3 and Table 5 show R values that are relatively low for the sample size that was analyzed, giving the impression that the results from the research are relatively on the right track when variables are being organized. The F-tests from Table 3 representing 2017 show that all the variables put together from table 4 do not have a statistically significant result to reject the null hypothesis. It also shows that the ability to say that the variables had any affect out of chance on the controlled variable was very large, meaning it can be harder to determine whether a change had occurred or not. Table 5 as precursor to the data on table 6 shows that the F-test value grew even larger, meaning the chance that anomalies arose out of statistical chance grew even larger.

Table 7 and 8 demonstrate a regression analysis on the wait to appointments in days as the variable being studied and the calls made in 2019 as opposed to 2017 as the difference between table 9 and table 10. Table 7=2017 and Table 8=2019. The results show that there are not statistically significant results to determine whether the increase or decrease in days was merited from the data.

Table 1

Table

Description automatically generated

(Appt. offered 2017)

Table 2

Table

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(Appt. offered 2019 wait-times)

Table 3

Table

Description automatically generated

Table 4

Table

Description automatically generatedAppointment offered 2017)

Table 5

Table

Description automatically generated

Table 6

Table

Description automatically generated(appt. offered in 2019).

Table 7

Table

Description automatically generated

(linear regression, appointments offered 2017 black females, white females, Hispanic females.)

Table 8

Table

Description automatically generated

(appointments offered in 2019).

Table 9

Graphical user interface, text, application

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(Average amount of days waiting for appointment in 2017)

Table 10

Graphical user interface, text, application

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(wait to appointment for 2017).

Table 11

Table

Description automatically generated

(Shows linear regression analysis of wait times to appointments as the variable and successful calls in 2017 as the appt\_17 variable).

Table 12

Graphical user interface, application, table

Description automatically generated

(shows linear regression analysis of wait to appointments in days and successful calls made in 2019 as successful\_2019.)

**Conclusion**

The results from the data and subsequent analysis using mean, t-tests, and linear regression analysis on the question of change in availability of appointments in 2017 compared to 2019 and wait times in days for appointments for both years yielded mixed yet interesting results. Hispanic females with private insurance were offered appointments more often in 2017 which was statistically significant compared to 2019 where the results were more statistically insignificant. Given the results we cannot reject the global null hypothesis that care either got better or worsened. As for wait times the averages showed that the wait to appointments in days decreased by 2.9 days approximately from 2017 to 2019. The means test and t-tests using SAS yielded the same results, however when using a linear regression-analysis the results were not so clear. Results that were not statistically significant were yielded leading me wonder if the results were conclusive or not. The R values for some of linear regressions were unusually high suggesting maybe a larger pool calls or reanalysis of input of variables is needed in the research. The R values for appointments made in 2017 and 2019 are very low suggesting anomalies arising out of statistical chance are predictably low which should reinforce the unusual results found for Hispanic females with private insurance in 2017. Given the R-values for the linear regression analyses done for 2017 and 2019 appointments offered and the results they yielded results that were not statistically significant again failing to reject or confirm whether access to care got better or worsened in 2017 as compared to 2019. This is important because of the previous known disparities that were prominent in access to care as mentioned in the introduction of this paper, further analysis would need to be done using more data sets to answer the full question of whether access changed for the tested categories of patients.

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