WEST COAST HEALTH PLAN + DOCENT HEALTH: OPERATIONAL ANALYSIS

MAY 2020

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EXECUTIVE SUMMARY

OBJECTIVE: This analysis was run using data fields produced by a health plan located in the West Coast, alongside their technology and services partner, Docent Health. The partnership was officially launched on October 1st, 2019, and after the first six months of operations, an attempt was made to look at two key areas of pronounced importance: engagement with primary care providers and engagement with the health plan's portal, MyHealthOnline (MHO). The objective of the study was to quickly determine if the engagement model provided by the Docent Health technology and services could positively influence behavior change with regards to key health plan resources.

METHODOLOGY: We define and compare two member populations. The first is the "Docent" population, which consists of subscribers who have connected with the Docent Health technology enabled services (via text, email, or phone call) and have an effective date on or after 10/1/2019. The second is the "Baseline" population, which consists of subscribers without any Docent connection and have an effective date on or after 1/1/2019.

Using 2-sample proportions tests, we checked for independence between the two groups and key outcomes metrics including member portal account activation, member portal log-in rate, member portal usage rate, rate of members with a PCP assignment, and rate of members with a PCP visit. Additional research and analysis details can be found in the pages following the Executive Summary.

OUTCOMES: A summary of the analysis concluded, with statistical significance, that the introduction of the Docent Health program since 10/1/2019:

- Improved member portal account activation by **19.35%**
- Improved member portal log-in rate by **19.98%**
- Improved member portal usage rate by **17.44%**
- Improved rate of members with a PCP assignment by **18.09%**
- Improved rate of members with a PCP visit by **10.70%**

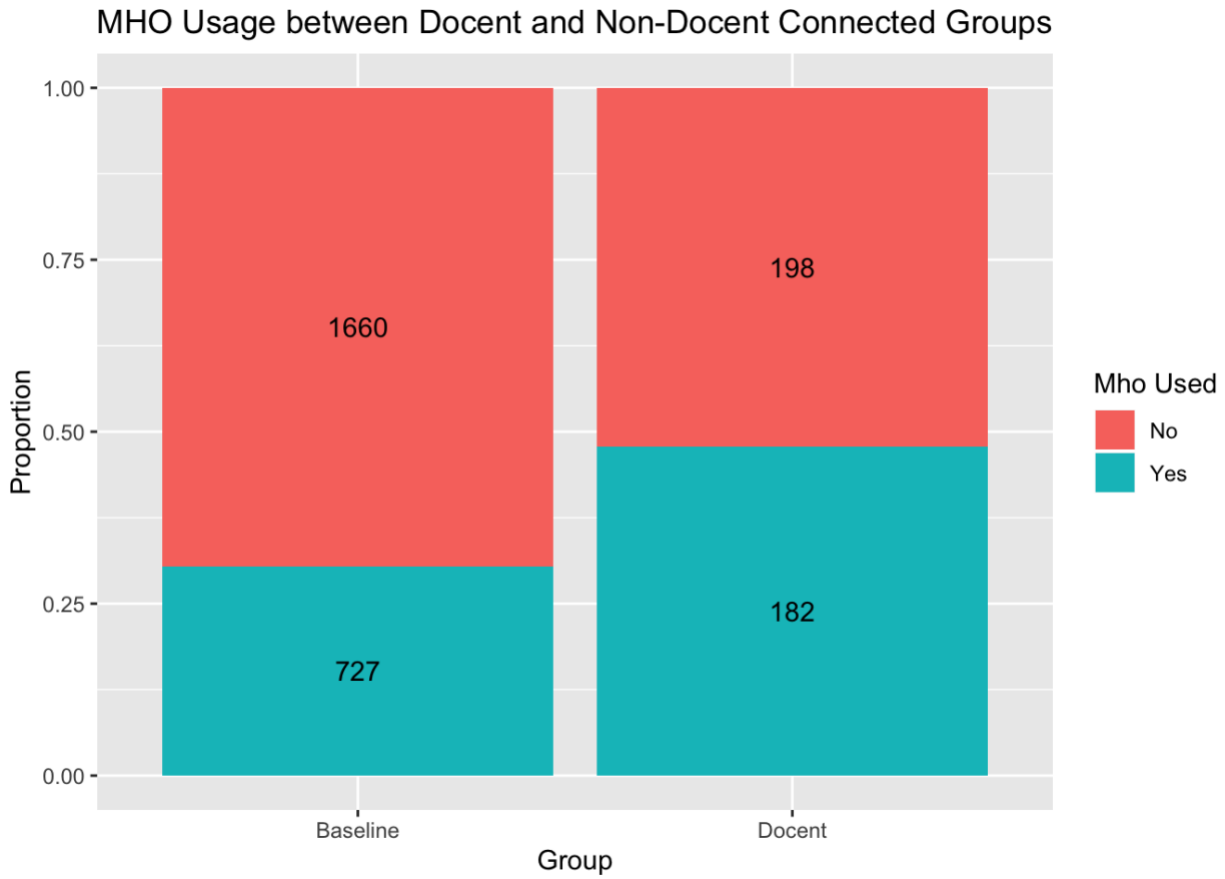
KEY FINDINGS: The results of the study show how the integration and utilization of Docent Health positively changes member behaviors. By modernizing communication and coordination tools, subscribers are becoming more activated in key programs that are proven to reduce costs, improve health outcomes, and elevate subscriber satisfaction. The statistical significance of these results is directly correlated to a sizable, and strategically important, ROI for the health plan.

Are members engaged by Docent more likely to use their portal, "MyHealthOnline" (MHO) account?

We used the criteria outlined in the Methodology section to define the Docent and Baseline groups. The column *MHO Used* is our dependent variable of interest, with either "Yes" or "No" responses. All empty values will also be filtered out.

```
MHO_Used <- ops_data %>%
  mutate(Group = as.factor(if_else(Connected == 1 & `Effective Date After Go
Live` == "After 10/1/2019",
                           "Docent", if_else(Connected == 0, "Baseline", "From
Campaign")))) %>%
  filter(!is.na(`Mho Used`),
         Group != "From Campaign")
```

The following bar chart shows the count for each group as well as relative proportions.



Using a 2 sample proportions test, we will check for independence between "Mho Used" and "Group".

$H_0: p_2 - p_1 = 0$
$H_A: p_2 - p_1 \neq 0$

The null hypothesis (H_0) states there is no real difference in the "Docent" proportion. The alternative hypothesis (H_A) states the "Docent" proportion is in fact not equal to the "Baseline" proportion (we're hoping for a greater value), implying a relationship between the "Group" and whether or not MHO was used by the subscriber.

```
mho_used_test <- prop.test(x = c(182, 727), n = c(182+198, 727+1660), alterna
tive = "two.sided", correct = F)
mho_used_test
```

```
##
##  2-sample test for equality of proportions without continuity
##  correction
##
## data:  c(182, 727) out of c(182 + 198, 727 + 1660)
## X-squared = 45.189, df = 1, p-value = 1.789e-11
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.1208678 0.2278941
## sample estimates:
##    prop 1    prop 2
## 0.4789474 0.3045664
```

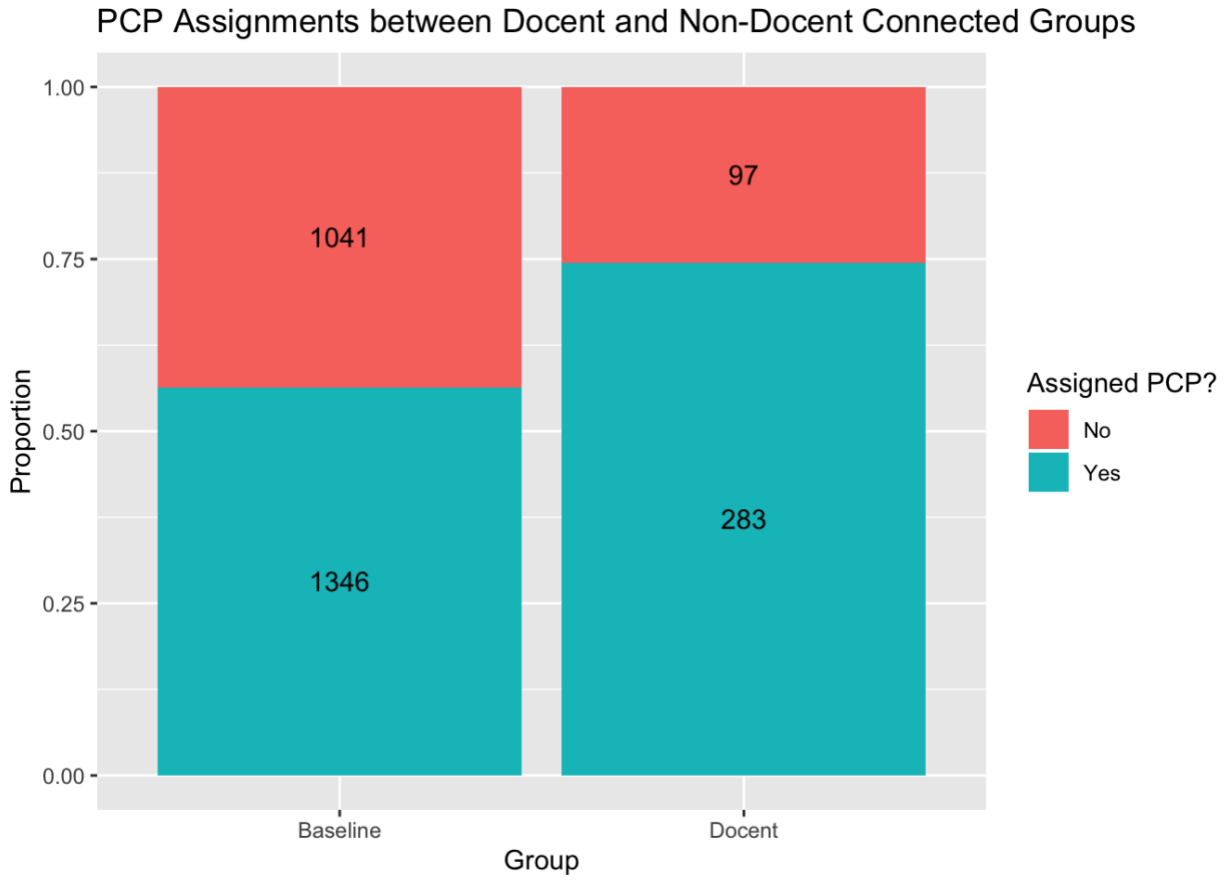
The p-value for this test is 1.788975110^{-11} which is extremely significant. **We can reject the null hypothesis that the proportion of MHO Usage for Docent connected subscribers is equal**.

Are members engaged by Docent more likely to have a PCP assignment?

Using the same definitions for "Docent" and "Baseline" populations, we build our data for the next test. The variable of interest is *Assigned PCP?*. NA values are again filtered out.

```
PCP_Assigned <- ops_data %>%
  mutate(Group = as.factor(if_else(Connected == 1 & `Effective Date After Go
Live` == "After 10/1/2019",
                           "Docent", if_else(Connected == 0, "Baseline", "From
Campaign")))) %>%
  filter(!is.na(`Assigned PCP?`),
         Group != "From Campaign")
```

Again, the bar chart displays the necessary information.



The test results are as follows.

```
pcp_assignment_test <- prop.test(x = c(283, 1346), n = c(283+97, 1346+1041),
alternative = "two.sided", correct = F)
pcp_assignment_test
```

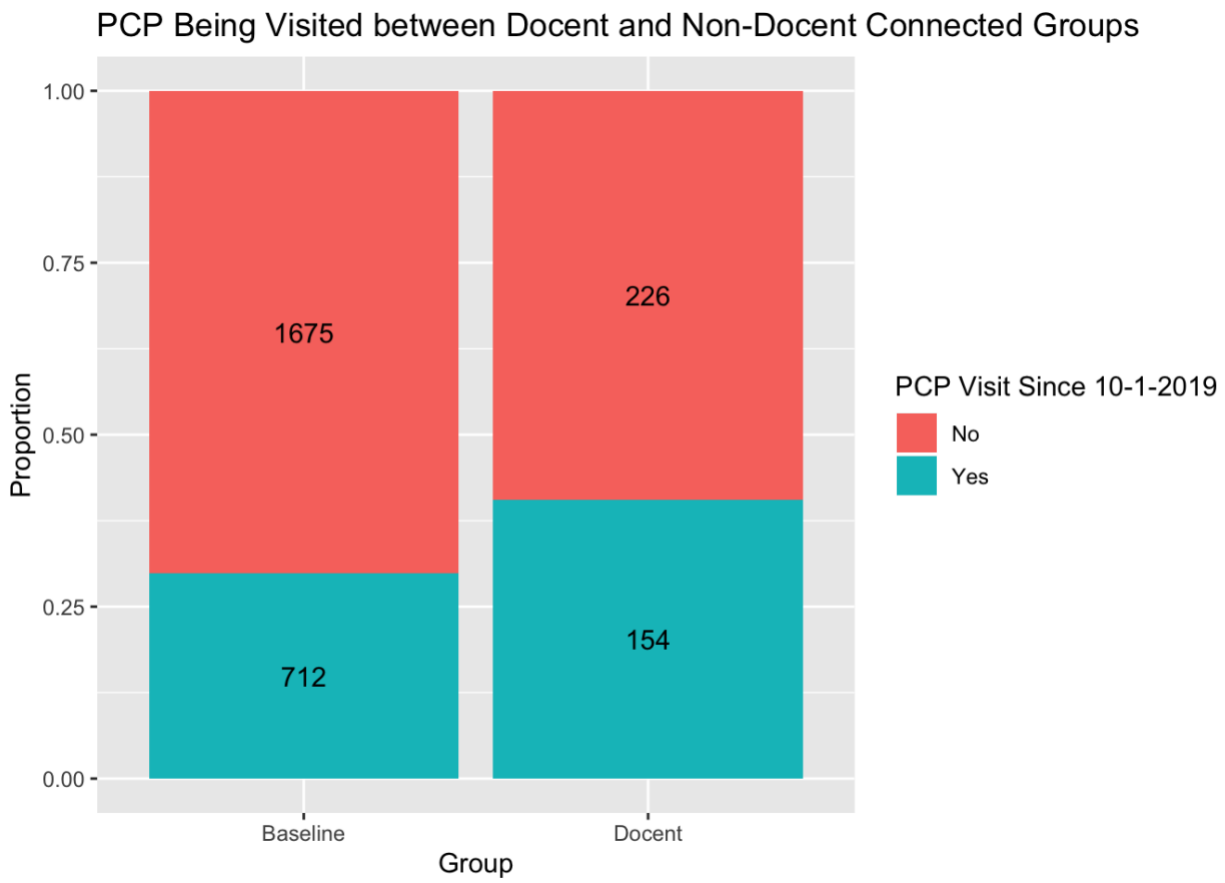
```
##
##  2-sample test for equality of proportions without continuity
##  correction
##
## data:  c(283, 1346) out of c(283 + 97, 1346 + 1041)
## X-squared = 44.281, df = 1, p-value = 2.845e-11
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.1327083 0.2289900
## sample estimates:
##    prop 1    prop 2
## 0.7447368 0.5638877
```

The p-value for this test is 2.845053910^{-11} which is significant. **We can reject the idea that the Docent connected subscribers are equally (or less) likely to have a PCP assigned**.

Are members engaged by Docent more likely to have a PCP visit?

The data is formatted to differentiate the two groups as before and filters out NAs for the dependent variable *PCP Visit Since 10-1-2019*.

```
PCP_Visit <- ops_data %>%
  mutate(Group = as.factor(if_else(Connected == 1 & `Effective Date After Go
Live` == "After 10/1/2019",
                           "Docent", if_else(Connected == 0, "Baseline", "From
Campaign")))) %>%
  filter(!is.na(`PCP Visit Since 10-1-2019`),
         Group != "From Campaign")
```



The test results:

```
pcp_visit_test <- prop.test(x = c(154, 712), n = c(154+226, 712+1675), altern
ative = "two.sided", correct = F)
pcp_visit_test
```

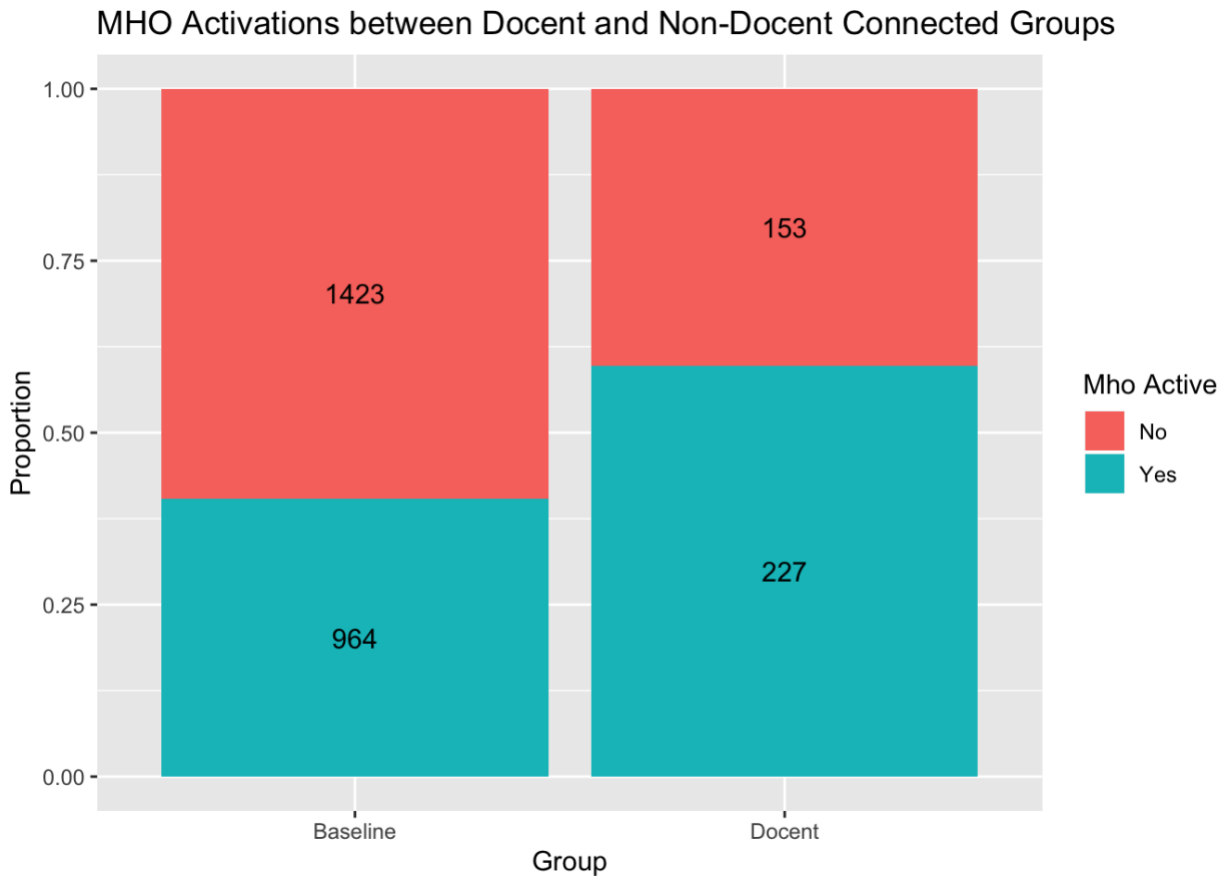
```
##
##  2-sample test for equality of proportions without continuity
##  correction
##
## data:  c(154, 712) out of c(154 + 226, 712 + 1675)
## X-squared = 17.448, df = 1, p-value = 2.952e-05
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.05431778 0.15964381
## sample estimates:
##    prop 1    prop 2
## 0.4052632 0.2982824
```

The p-value, 2.952051710^{-5}, is significant. **We reject the idea that the Docent connected subscribers are equally (or less) likely to visit their PCP**.

Are members engaged by Docent more likely to have an activated MHO account?

The variable of interest is *MHO Active* with NAs filtered out.

```
MHO_Active <- ops_data %>%
  mutate(Group = as.factor(if_else(Connected == 1 & `Effective Date After Go
Live` == "After 10/1/2019",
                           "Docent", if_else(Connected == 0, "Baseline", "From
Campaign")))) %>%
  filter(!is.na(`Mho Active`),
         Group != "From Campaign")
```



Test results:

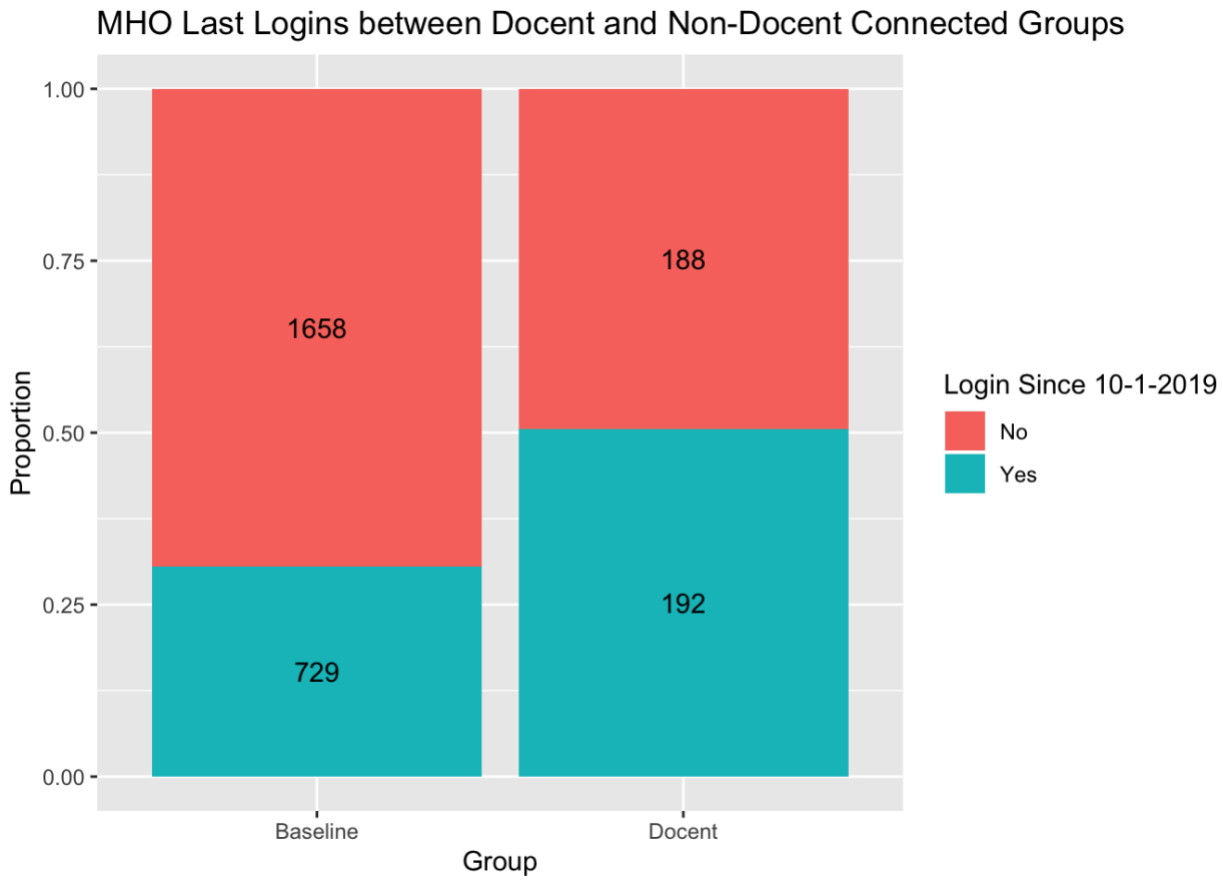
```
mho_activate_test <- prop.test(x = c(227, 964), n = c(227+153, 964+1423), alt
ernative = "two.sided", correct = F)
mho_activate_test

##
##  2-sample test for equality of proportions without continuity
##  correction
##
## data:  c(227, 964) out of c(227 + 153, 964 + 1423)
## X-squared = 50.073, df = 1, p-value = 1.481e-12
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.1404210 0.2466074
## sample estimates:
##    prop 1    prop 2
## 0.5973684 0.4038542
```

The p-value, 1.481372510^{-12}, is significant. **We reject the idea that the Docent connected subscribers are equally (or less) likely to activate MHO**.

Are members engaged by Docent more likely to log into their MHO account?

The variable of interest is *MHO Login Since 10-1-2019* with NAs filtered out.

```
MHO_Login <- ops_data %>%
  mutate(Group = as.factor(if_else(Connected == 1 & `Effective Date After Go
Live` == "After 10/1/2019",
                           "Docent", if_else(Connected == 0, "Baseline", "From
Campaign")))) %>%
  filter(!is.na(`MHO Login Since 10-1-2019 (copy)`),
         Group != "From Campaign")
```



Test results:

```
mho_login_test <- prop.test(x = c(192, 729), n = c(192+188, 729+1658), altern
ative = "two.sided", correct = F)
mho_login_test

##
##  2-sample test for equality of proportions without continuity
##  correction
##
## data:  c(192, 729) out of c(192 + 188, 729 + 1658)
## X-squared = 58.966, df = 1, p-value = 1.604e-14
## alternative hypothesis: two.sided
## 95 percent confidence interval:
##  0.1463016 0.2534162
## sample estimates:
##    prop 1    prop 2
## 0.5052632 0.3054043
```

The p-value, 1.604300610^{-14}, is significant. **We reject the idea that the Docent connected subscribers are equally (or less) likely to log into MHO**.

Data Source Reference:

The data source used is a subset of the merged "HealthPlan_Source_Data" and "Health Plan DHP Activities and Texts" tables pulled from the Tableau workbook "Health Plan_Outcomes Analysis". Each observation/row is a subscriber. The data source itself will henceforth be referred to as "ops_data". This analysis was conducted by Jeff Mora and concluded in May of 2020.