England's Third Places – Investigating the Effectiveness of London Pubs in Maintaining Good Mental Health

Word count: 1783

Abstract

This report uses OLS to test the impact of pubs on local people's mental health. The report posits that pubs should benefit wellbeing, providing somewhere to unwind away from home and work. However, this report's models suggest the opposite, where an increase in London pubs corresponds to a statistically significant increase in mental health cases. This is true after adjusting for income and population, and applying working hours as a moderator. Therefore, the report concludes that, in London, pubs may negatively affect local people's mental health. However further research is required to verify whether this is a direct causal relationship.

Introduction and Literature Review

'The soul of London resides in her many pubs ,' claims Ray Oldenburg in *The Great Good Place* (Oldenburg, 1989a). This report wishes to verify this claim. Specifically, it asks: does the number of pubs in a London borough have a quantifiable positive effect on local people's mental health?

Some scholars herald Western culture's decline, partly caused by the deterioration of meaningful social connections (or a loneliness epidemic), which in turn leads to a depression and mental health crisis observed today (Hari, 2018a). 'More people say they feel lonely than ever before,' and this can worsen physical ailments: 'cancer, heart disease, respiratory problems' (Hari, 2018b). Loneliness could be exacerbated by lack of infrastructure (so-called 'third places') designed to accommodate gatherings away from 'the constricted pattern of daily life that easily generates the familiar desire to "get away from it all."' (Oldenburg, 1989b)

Third places encompass 'a great variety of public places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work' (Oldenburg, 1989b). Being, among other things, accessible neutral-ground designed for conversation, Oldenburg considers them invaluable to maintaining and repairing the social connections being lost in the West (Oldenburg, 1989d). If he is

correct, and third places can reverse the loneliness epidemic in Western countries, this should be statistically verifiable, such that residents in areas with more third places have fewer mental health problems.

This report attempts to see if such a trend is visible within London. Because Oldenburg believes 'the pub is the average Englishman's third place', the report considers the relationship between pubs and mental health. If pubs do correlate with good mental health, perhaps more should be built in London as a starting point to improve mental health. Regardless, the report will shed light on an aspect of the loneliness epidemic.

Data

All data used in this report comes from the London Datastore, since the investigation focuses on London. Sorting data points by London borough allows for easy data processing. Therefore, datasets chosen for the report a) require data on a desired variable and b) must be separable by London borough.

These are the variables to consider.

Independent Variable	Number of pubs
Dependent Variable	Mental health issues
Confounding Variable	Population
Confounding Variable	Income
Moderator	Working hours

The variables and data sources are outlined below.

1. **Number of pubs:** London Datastore has no dataset stating the number of pubs per borough, so this information was extracted from a dataset recording every London pub's location. The pubs were sorted into their respective boroughs (GLA, 2024).
2. **Mental health issues:** A dataset containing the number of Employment and Support Allowances (ESAs) claimed for mental health issues was chosen to estimate presence of mental health issues in a borough. ESAs support those of working age who are seriously afflicted by health conditions (UK Government, N/A). Therefore, it is reasonable to assume that boroughs with greater numbers of mental health ESAs have more residents suffering from serious mental health conditions. This is a rough estimate with several limitations: the approximation assumes mental health is binary – either bad or good; ESA worthy or not. The number of ESAs only captures severe enough mental health issues to warrant intervention, so boroughs with may low-level mental health issues are missed. There may also be covariate factors impacting the willingness of residents to submit claims which this model doesn't consider. However, this dataset can still provide an initial indication to inform future research. Additionally, an advantage

of estimate mental health with ESAs is that it excludes young people who cannot benefit from pubs due to age restrictions. The dataset records ESA numbers for the years 2010-2018. The pubs dataset applies to 2024, so analysis cannot be conducted for a specific year. Nevertheless, pubs are built or destroyed at a negligible rate, so year-non-specific analysis is acceptable. Therefore, ESA numbers across the eight years were averaged by borough (Department for Work and Pensions, 2019).

3. **Population:** The number of pubs and ESAs claimed depend on a borough's population. 2011 Census data was chosen to approximate borough populations between 2010 and 2018 (Census Information Scheme, 2024).
4. **Income:** Wealth could impact mental illness risk. Low-paying jobs, and associated low-statuses, are major causes of stress and anxiety (Hari, 2018a). A dataset containing MSOAs' estimated weekly average incomes in 2013-2014 was selected, and areas outside London were removed, to approximate London boroughs' incomes between 2010 and 2018 (ONS, 2020).
5. **Working hours:** Boroughs only benefit from pubs if their residents have time to frequent them. This report uses working hours under the assumption that longer working hours lead to reduced free time. There may be exceptions, as people are accessible via phone and email, but the generalisation is reasonable. A dataset estimating working hours per week in 2013 was chosen (ONS, 2014).

Table 2: summary statistics after removing outliers

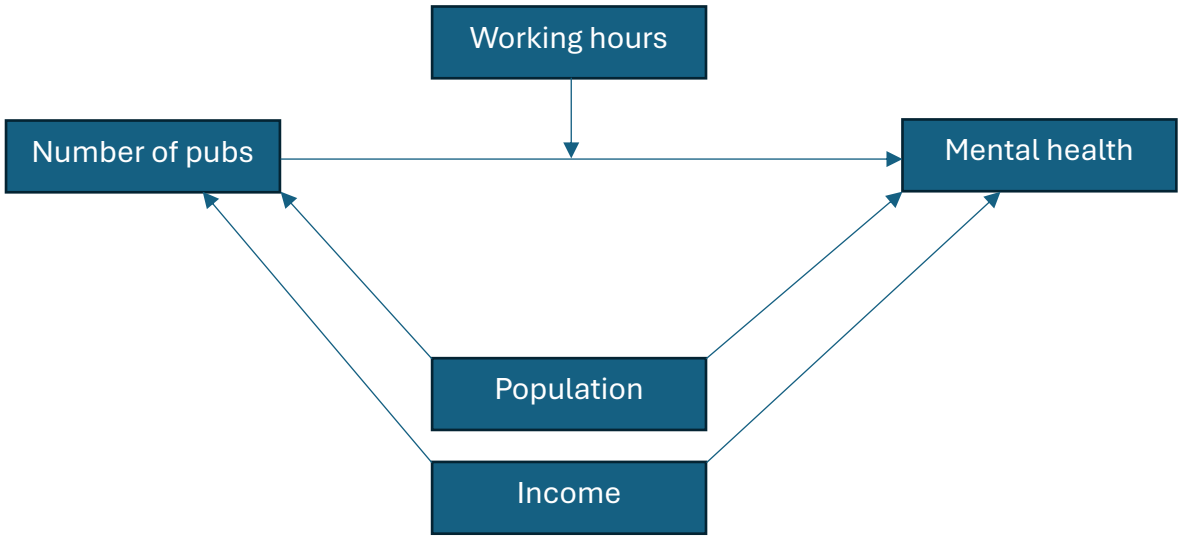
Statistic	N	Mean	St. Dev.	Min	Max
Hours.10	29	3,613.8	1,510.8	1,500	6,200
Hours.10.34	29	29,300.0	8,434.8	14,900	54,100
Hours.34.44	29	54,417.2	13,707.0	23,100	80,400
Hours.45	29	36,620.7	10,217.1	23,700	71,200
Average.Income.after.Housing.Cost	29	539.3	79.5	383.5	740.0
Pop.2011..per.1000.	29	257,537.3	57,416.7	158,649	363,378
Pubs	29	106.4	50.9	29	243
Av.ESA	29	3,276.9	1,071.9	1,480.0	4,930.0

Process for removing outliers is outlined in r-markdown file – most of the distribution was fine, but values outside 2 standard deviations of the mean were removed.

Methodology

All plots come from the r-markdown file included in the submission.

This DAG shows the postulated relationship.



The models in this report are variations on Ordinary Least Squares linear regression between the independent variable (number of pubs) and the dependent variable (mental health) to investigate whether there is a general upward/downward trend. After removing outliers there are 29 data points; convention advises drawing conclusions from no fewer than 30. Therefore trends uncovered in this analysis are tentative, and only coefficients at the $p<0.01$ significance level are accepted.

The models used in this analysis are as follows.

Model 1:

$$ESA = \alpha_1 + \beta_1 * Pubs + \varepsilon$$

The most fundamental regression model, this is not used to infer anything, but the report documents how the relationship between ESA and pub numbers change with added variables.

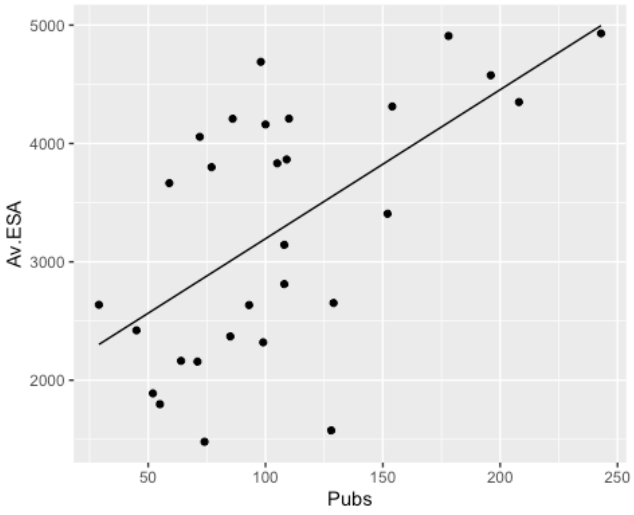


Table 3: ESA against Pubs

	Dependent variable:
	ESA Score
Pubs	12.588***
	(3.252)
Constant	1,936.837***
	(382.419)
Observations	29
R2	0.357
Adjusted R2	0.333
Residual Std. Error	875.361 (df = 27)
F Statistic	14.986*** (df = 1; 27)
Note:	*p<0.1; **p<0.05; ***p<0.01

$\beta_1 = 12.588$ is statistically significant so, for every added pub in a borough, the number of ESA claims increases by 13. So far a positive relationship is expected, as both variables are collinear with population; indeed, the low adjusted R^2 value, 0.333, shows that the model only explains a third of the observed ESA variation.

Model 2:

Rather than include population as a confounding variable within the equation, the dependent and independent variables are adjusted individually, to avoid confusion as more variables are added.

$$\text{ESA Density} = \alpha_2 + \beta_2 * \text{Pub Density} + \varepsilon$$

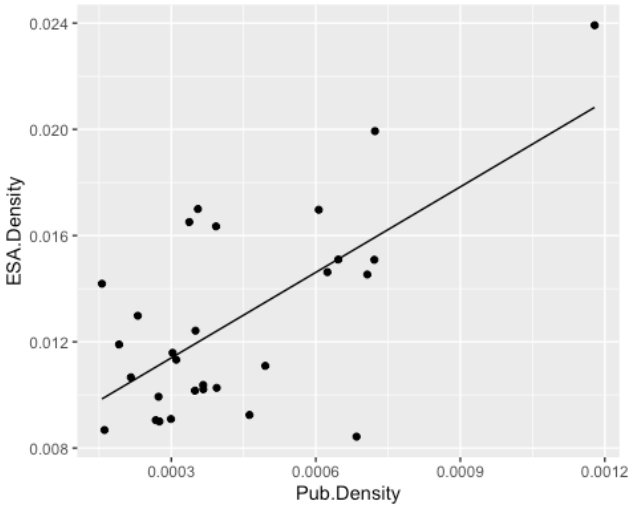


Table 3: ESA density against Pub density

	Dependent variable:
	ESA density
Pubs per person	10.733***
	(2.405)
Constant	0.008***
	(0.001)
Observations	29
R2	0.424
Adjusted R2	0.403
Residual Std. Error	0.003 (df = 27)
F Statistic	19.915*** (df = 1; 27)
Note:	*p<0.1; **p<0.05; ***p<0.01

With $\beta_2 = 10.733$, the correlation remains positive, surprisingly. For every extra pub per person, 11 ESAs are submitted per person! Further, the adjusted R^2 isn't doesn't see much increase, showing that little of the correlation is explained by density.

Model 3:

This model includes income as a confounding variable.

$$\text{ESA Density} = \alpha_3 + \beta_3 * \text{Pub Density} + \beta_4 * \text{Stratified Income} + \varepsilon$$

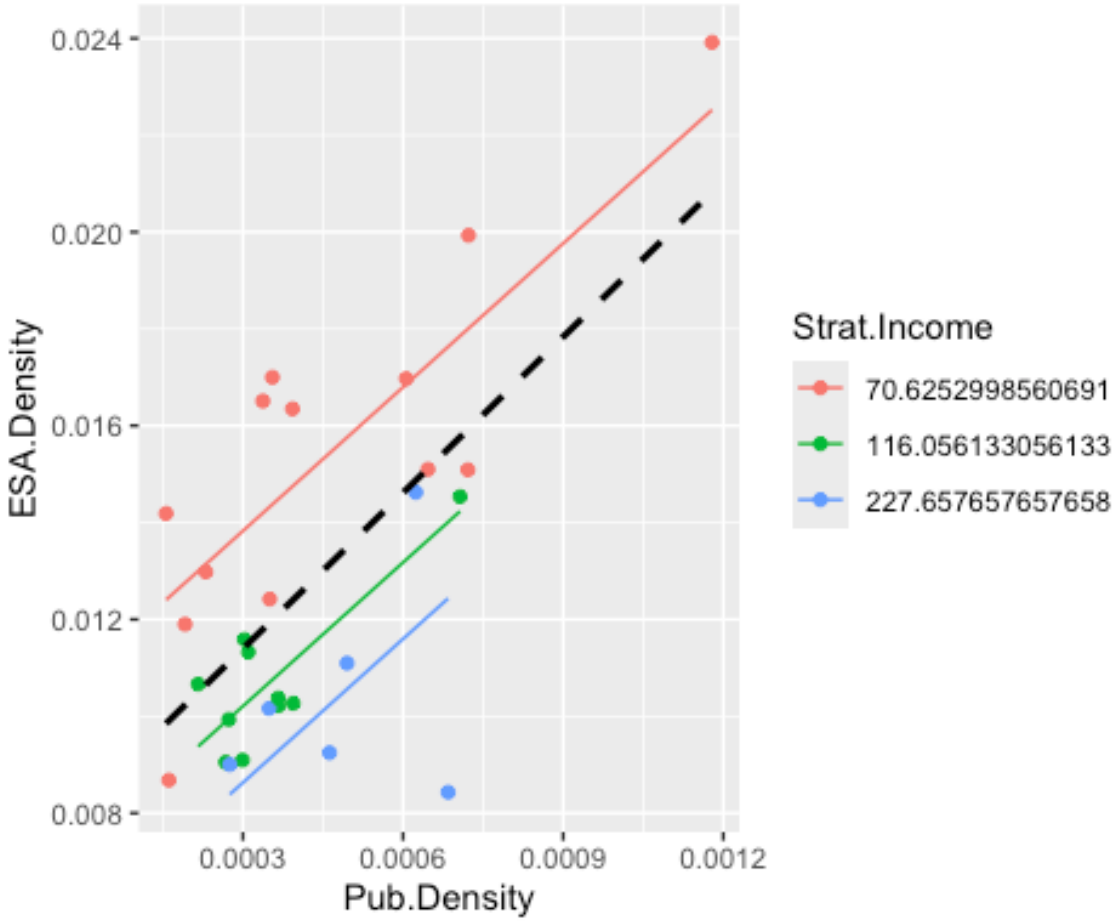


Table 4: ESA density & Pub density with income

	Dependent variable:
	ESA density
Pubs per person	9.894***
	(1.633)
Strat.Income116.056133056133	−0.004***
	(0.001)
Strat.Income227.657657657658	−0.005***
	(0.001)
Constant	0.011***
	(0.001)
Observations	29
R2	0.771
Adjusted R2	0.743
Residual Std. Error	0.002 (df = 25)
F Statistic	27.988*** (df = 3; 25)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 4: ESA density & Pub density with income

Income

After stratifying by income, the correlation remains positive at $\beta_3 = 9.894$. The adjusted R^2 increases drastically to 0.743, so nearly ¾ of the ESA variability is explained by this model.

Model 4:

Leaving income for the moment, the moderator (working hours), is integrated into model 2.

$$\text{ESA Density} = \alpha_4 + \beta_5 * \text{Pub Density} + \beta_6 * \text{Mode Hours Worked} + \beta_7 * \text{Pub Density} * \text{Mode Hours Worked} + \varepsilon$$

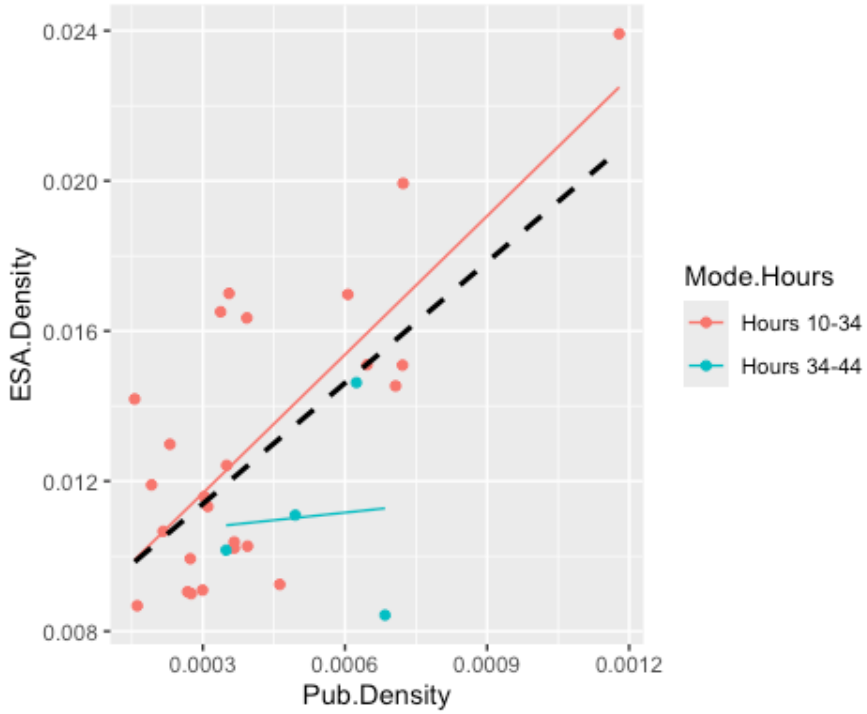


Table 5: ESA density & Pub density with free time

	Dependent variable:
	ESA density
Pubs per person	12.304***
	(2.321)
Max.HoursHours.34.44	0.002
	(0.006)
Pub.Density:Max.HoursHours.34.44	−10.958
	(10.614)
Constant	0.008***
	(0.001)
Observations	29
R2	0.546
Adjusted R2	0.491
Residual Std. Error	0.003 (df = 25)
F Statistic	10.003*** (df = 3; 25)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 5: ESA density & Pub density with free time

Hours Worked

Moderators sometimes change the sign of a relationship. However, β_6 and β_7 are not statistically significant, so this model reveals little.

Model 5:

Equivalent to model 4 with a continuous (rather than categorical) moderator. If coefficients remain statistically insignificant, working hours may not be a moderator after all.

> ESA Density = $\alpha_5 + \beta_8$ * Pub Density + β_9 * Av. Hours Worked + β_{10} * Pub Density * Av. Hours Worked + ε

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Table 6: ESA density & Pub density with continous free time
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                          Dependent variable:
                      ---------------------------
                                ESA density
------------------------------------------------
Pubs per person                  -36.781
                                (100.863)

Apx.Hours                        -0.001
                                 (0.001)

Pub.Density:Apx.Hours             1.357
                                 (2.780)

Constant                          0.057
                                 (0.051)

------------------------------------------------
Observations                       29
R2                                0.461
Adjusted R2                       0.396
Residual Std. Error         0.003 (df = 25)
F Statistic              7.115*** (df = 3; 25)
================================================
Note:                *p<0.1; **p<0.05; ***p<0.01

Table 6: ESA density & Pub density with continous free time
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Hours Worked
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The correlation finally becomes negative, with β_8 = -36.781. However, none of the coefficients are statistically significant, so we cannot use them.

Model 6:

Models 3 and 5 are combined.

> $\alpha_6 + \beta_{11}$ * Pub Density + β_{12} * Mode. Hours Worked + β_{13} * Pub Density * Mode Hours Worked + β_{14} * Stratified Income + ε

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Table 7: Full model
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                                Dependent variable:
                            ---------------------------
                                      ESA density
-------------------------------------------------------
Pubs per person                         -17.897
                                       (70.187)

Apx.Hours                              -0.00005
                                        (0.001)

Strat.Income116.056133056133           -0.004***
                                        (0.001)

Strat.Income227.657657657658           -0.005***
                                        (0.001)

Pub.Density:Apx.Hours                   0.748
                                       (1.935)

Constant                                0.013
                                       (0.037)

-------------------------------------------------------
Observations                              29
R2                                       0.776
Adjusted R2                              0.727
Residual Std. Error                0.002 (df = 23)
F Statistic                  15.945*** (df = 5; 23)
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Note:                         *p<0.1; **p<0.05; ***p<0.01

Table 7: Full model
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Hours Worked
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Table 7: Full model
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Income
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Again, a statistically insignificant correlation arises. The adjusted R^2 value is like that of model 3's at 0.727, unlike model 5's 0.396, suggesting that the explanatory power comes from the confounder, income, not the moderator, working hours. Indeed, only the income coefficients are statistically significant.

Running Gauss-Markov diagnostics reveals that model 3 is the most reliable, but still flawed, because there are so few data points. Therefore, model 3 is tentatively considered the authoritative model, and the relationship is inferred to be a simple linear regression with confounders, not a moderation model. This may due to covariance of working hours with income and number of pubs, since pubs are unlikely to succeed if residents have neither the time nor money to spend there.

Conclusion

Due to the statistically significant positive correlation in model 3, there is sufficient evidence to reject the hypothesis that there is no relationship between the number of pubs and ESA claims in London and accept an alternative hypothesis that pubs and ESAs are positively correlated. However, causality cannot be inferred. It is possible that 'the character of the pubs is declining' (Oldenburg, 1989c), and they negatively affect mental health because 'You're nothing to the people around you, and they're nothing to you'

(Hari, 2018b). Further, alcohol could worsen depression. Alternatively, there could be another confounder which hasn't been considered – pubs aren't the only third places in London, and perhaps the number of pubs in a borough is negatively associated with that of other more effective third places. All that can be determined for certain is that London pubs seem to be associated with a higher number of serious mental health issues.

Limitations and Possible Future Work

The main limitation is the small sample size: just 29 boroughs in one city were analysed, so it is unsurprising that there was some insignificance. A UK-wide analysis of pubs and mental health would provide much more insight, if the data is available.

The models also assume no travel between boroughs, which is clearly not true. Future models might require commuting data to circumvent this limitation.

If the research question is extended to third places in general, rather than merely pubs, then equivalent analyses could be conducted with churches, cafes and parks as alternative independent variables.

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