

1 Appendix

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3 Calculation of the difference of coefficients

4 When outcome variable is log transformed, the regression coefficient was interpreted as the
5 expected change in log of outcome respect to a one-unit change in predictor. Alternatively, a
6 more natural way to do is to interpret the exponentiated regression coefficients, $\exp(\beta)$, since
7 exponentiation is the inverse of logarithm function. In terms of percent change, we used $(\exp(\beta)-$
8 $1)*100\%$, e.g., when the coefficient is 0.029, it corresponded to an increase of $(\exp(0.029)-1$
9 $)*100\%= 2.97\%$. The difference of coefficients was calculated by $\exp(0.029) - \exp(-0.073) =$
10 0.0997 , corresponding to an decrease of 9.97%. The 95% confidence interval of the difference
11 was obtained using Bootstrap simulations (see Efron B, Tibshirani RJ. An Introduction to the
12 Bootstrap. 1993.).

13 *[Appendix Figure 1]*

14

15 Sensitivity Analysis I

16 The SARIMAX model used in this study is based on an auto regressive integrated
17 moving average (ARIMA) model (see Box GE, Jenkins GM. Time series analysis: Forecasting
18 and control. San Francisco: Holden-Day, Inc.; 1976.). ARIMA consists of three components—
19 autoregression, integration, and moving average. An autoregression component indicates that a
20 variable is correlated with its past values; an order of time lagged in this component is denoted p .
21 An integration component indicates a degree of differencing, which is denoted d . A moving-
22 average component indicates that a variable is correlated with past error terms; an order of

23 moving average in this component is denoted q . These parameters of ARIMA denotes (p, d, q) .
 24 ARIMA is used for non-seasonal data. For seasonal time-series, corresponding seasonal terms
 25 (P, D, Q) are added to ARIMA denotes $(p, d, q) (P, D, Q)_m$, where m refers to a number of
 26 observations per one cycle of the time-series—typically, a year (see Hyndman RJ,
 27 Athanasopoulos G. Forecasting: principles and practice: OTexts; 2018.). To incorporate an
 28 explanatory (exogenous) variable into the model, an extension of a seasonal ARIMA—namely
 29 SARIMAX—was used.

30 SARIMAX requires a stationary time-series. Monthly per capita consumption data was
 31 first explored by decomposing into trend, seasonal variation, and remainder component.
 32 Increasing trend and seasonal variation of the data suggested non-stationary of the data. The
 33 stationary time-series was attained by differencing the monthly per capita consumption (first-
 34 order differencing), which was confirmed by the Augmented Dickey-Fuller and Kwiatkowski-
 35 Phillips-Schmidt-Shin tests. The differenced time-series was analyzed with the SARIMAX
 36 model as a dependent variable.

37 **Table 1** Estimates from SARIMAX model.

Variable	Coefficient	95% CI
Moving average at lag 1	-0.8543*	-0.9758, -0.7329
Moving average at lag 2	-0.1030	-0.2268, 0.0208
Seasonal moving average at lag 1	0.4720*	0.3509, 0.5931
Seasonal moving average at lag 2	0.2932*	0.1628, 0.4236
Campaign effect	-0.0346*	-0.0677, -0.0015

38 Note: 95% CI = 95% confidence interval; * p-value < 0.05.

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40 **Sensitivity Analysis II**

41 GAM model statistics and Wald Chi-square test for the effects of the campaign on alcohol
 42 consumption per capita using all data points from January 1995 to September 2017

	Estimate	Standard Error	95% CI	Pr(> t)
(Intercept)	-0.832	0.014	(-0.859, -0.805)	<0.001
After Campaign	-0.064	0.052	(-0.166, 0.038)	0.219
Before Campaign	0.026	0.055	(-0.082, 0.134)	0.636

Smooth Terms	Effective degrees of freedom	F statistic	p-value
s(month over a year)	7.549	20.810	<0.001
s(time)	8.618	105.280	<0.001

*R-square of the model is 0.825

* The difference of coefficients for before and after campaign is significant. $\chi^2=7.306$ p-value =0.006

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44 **Sensitivity Analysis III**

45 GAM model statistics for the effects of the campaign on alcohol consumption per capita,
 46 including time trend and its interaction with campaign variable

	Estimate	Standard Error	95% CI	Pr(> t)
(Intercept)	-0.408	0.054	(-0.514, -0.302)	<0.001
Time	-0.003	0	(-0.003, 0.003)	<0.001
After Campaign	0.02	0.082	(-0.141, 0.181)	0.811
Before Campaign	0.001	0.069	(-0.134, 0.136)	0.993
After Campaign * Time	0	0	(0, 0)	0.163
Before Campaign * Time	0.001	0.001	(-0.001, 0.003)	0.533

47 *R-square of the model is 0.85

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49 **Sensitivity Analysis IV**

50 GAM model statistics for the effects of the campaign on alcohol consumption per capita,
 51 including 2008 and 2013 policy.

	Estimate	Standard Error	95% CI	Pr(> t)
(Intercept)	-0.384	0.054	(-0.490, -0.278)	<0.001
time	-0.003	0	(-0.003, -0.003)	<0.001
After Campaign	-0.069	0.049	(-0.165, 0.027)	0.16
Before Campaign	0.032	0.052	(-0.070, 0.134)	0.536
the 2008 Policy	0.002	0.035	(-0.067, 0.071)	0.956
the 2013 Policy	-0.043	0.034	(-0.110, 0.024)	0.211

52 *R-square of the model is 0.85
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