Using behavioural insights to reduce sugar consumption in Liverpool

Executive Summary

Over a quarter of adults in England are obese and a further third are overweight. A strong behavioural driver of increased obesity is the high availability of calories, especially sugar, in our day to day lives. If obesity is to be reduced, cutting sugar consumption is essential.

The Behavioural Insights Team (BIT) worked with the Local Government Association (LGA) and Liverpool City Council (LCC) on a trial to reduce sugar consumption in the hospital retail environment.

We tested how we could encourage hospital store customers to choose low sugar drinks instead of high sugar alternatives by making simple changes to the food environment in three stores across two hospitals in Liverpool.

There are two predominant traditional government approaches to tackling obesity: the use of economic incentives and the provision of information.

In relation to information provision, whilst it can be useful, it often does not feed effectively into consumer decision making. Food and drink items already contain labels with nutritional information which is aimed to help people make informed decisions about their choices. In particular, legislation requires producers to include sugar content on food and soft drink products. However, these labels can be confusing, and they may only be useful to those with sufficient time, understanding and interest in healthy eating.

There is increasing interest in the use of behavioural approaches to tackle obesity through reducing sugar consumption. A behavioural approach recognises that much of our sugar consumption is through 'mindless eating' which is heavily dependent on the environment in which we are making decisions. Hence changing the environment in which we make decisions, and specifically providing information at the decision point, can be an effective way to change the decisions themselves.

Based on the literature we designed a trial to test a behavioural intervention focussed on making information on sugar content easier to understand and more salient.

The trial

The intervention aimed to influence consumer decision making by clearly showing which drinks were high sugar at the point of purchase. On alternating weeks, simple on-shelf red 'pop-out' "stop" signs were placed on the refrigerator shelves containing high sugar chilled drinks in three hospital stores across two hospitals in Liverpool.

The analysis finds that the signs led to a 7.3% reduction in high sugar drinks sales, although it should be noted that these results are only significant at the 10% significance level (p=.09).[1] If the intervention was rolled out we estimate that this could lead to around 930 fewer high sugar drinks sold in the three stores over a year. Encouragingly for retailers, we did not find evidence that total chilled drink sales declined when the signs were in place, suggesting that people substituted to low sugar alternatives.

Trial design

A crossover design was used for this trial. In this design the intervention (the high sugar "stop" signs) was put up and taken down on alternating weeks in each store. When the signs were up in the Broadgreen store they were taken down in the Linda McCartney store and in the Royal Liverpool store and vice versa. RVS staff were responsible for the implementation of the trial including removing and replacing the signage on alternating weeks.

This design was chosen to maximise the validity of the trial. Simulation analysis of baseline data suggested a high likelihood of falsely detecting a positive effect using a difference-in-differences design.

The trial ran for a period of 14 weeks between Monday 1st May and Sunday 6th August, at the end of which sales data for the three stores was transferred to BIT for analysis.

Outcome measures

For this trial there was a primary outcome measure and a secondary outcome measure:

1. Primary outcome: Proportion of purchased drinks that had a sugar content above 8g per 100ml.
2. Secondary outcome: Sugar content of each drink sold.

Results

The results section is divided into three sections: the first section discusses the data used to analyse the results, the second section describes the primary and secondary findings and the second section discusses findings from our exploratory analysis.

Data

The RVS stores shared daily sales data for all cold drink products with BIT along with nutritional data for these products.[2] This allowed us to see how the sales of different products changed in each of the stores over time.

Primary and secondary analysis

The primary outcome was whether high sugar drinks as a proportion of total sales declined when the high sugar signs were in place. We find that the signs led to a 7.3% reduction in high sugar drinks sales although these results are only significant at the 10% significance level (p = .09).[3]

Figure 3 shows the primary outcome results. The bar charts indicate the percentage of sales that are high in sugar when the signs are or are not in place.[4]

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[2] Nutritional information for 99.5% of sales volume was available.

[3] It should be noted that this is higher than the conventional 5% level. However, it should be noted that this trial design may be subject to spillover effects (seeing the signs one week affects your behaviour the following week) which can reduce the estimated effect and hence increase the p-value.

[4] These percentages are averages over the three stores, time period of the trial and different days of the week.
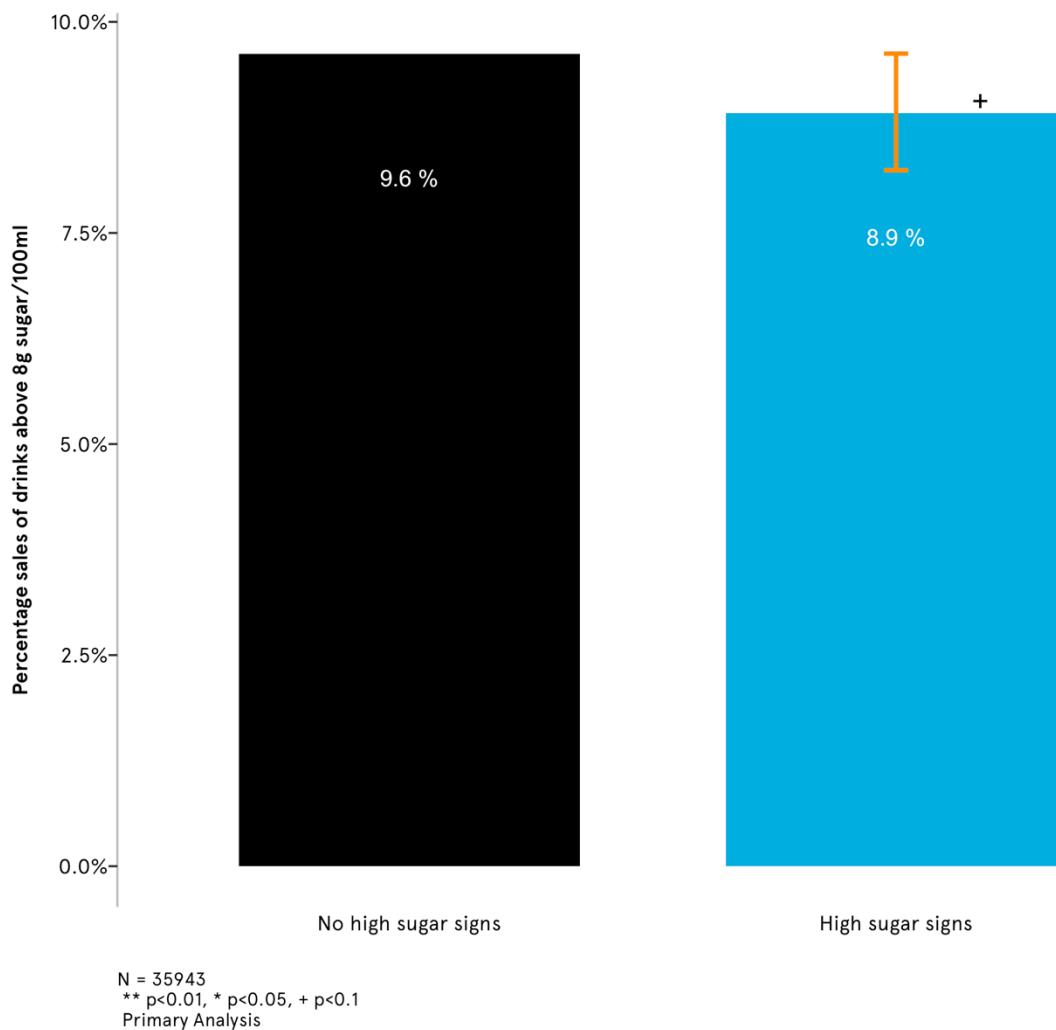
Figure 3. Primary outcome results demonstrating the percentage of sales that are high in sugar when the signs are or are not in place.

When the signs are not present high sugar sales are 9.6% of total sales [CI: 8.9%, 10.4%] and when the signs are in place high sugar sales are 8.9% [CI: 8.2%, 9.6%] of total sales. This represents a 7.3% reduction in high sugar drinks sales. Whilst the absolute change is modest it should be noted that high sugar drink sales in these stores were already very low leaving less scope for further reduction.

The secondary outcome measure was whether the sugar content of drinks sold declined when the signs were in place. When we analysed this we did not find a statistically significant decrease in the sugar content of drinks sold when the signs were in place. We believe that this is because consumers substituted to slightly lower sugar content drinks which may not be detectable in the analysis (see exploratory analysis below).

Exploratory analysis

The exploratory analysis focussed on three areas: whether the high sugar signs affected total sales, how consumers shifted to different categories of drinks when the signs were in place and how the overall trend in high sugar drinks sales changed in the three stores during the trial period.

Total sales: It may have been the case that high sugar drinks sales were reduced as a result of people simply being deterred from purchasing any drink. Figure 4 below shows no clear decline in total sales during the trial period. The statistical analysis investigated whether or not total sales volume or value (in £) declined when the signs were in place. This analysis did not find any evidence that this occurred for sales volume or value.
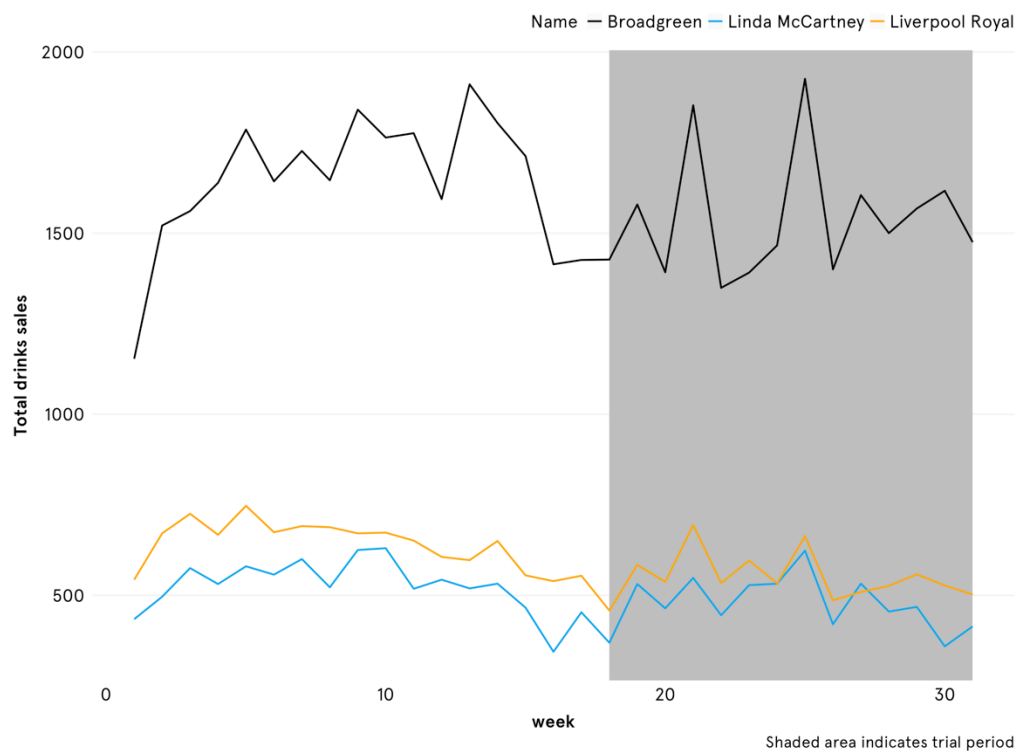

Figure 4. Total soft drinks sales before and during the trial period

Effect on different sugar content categories: Since we believe that consumers may have substituted to lower sugar alternatives we also analysed changes in the proportion of drinks with lower sugar content sold. Figure 5 below shows sales for different categories of sugar content when the signs are or are not in place. The slight increase in sales in the 5 to 8g per 100ml category when the signs are up provides some evidence that consumers

substituted down the scale from high to medium sugar content drinks.[5] It should be noted that this figure does not show drinks of less than 1g per 100ml.
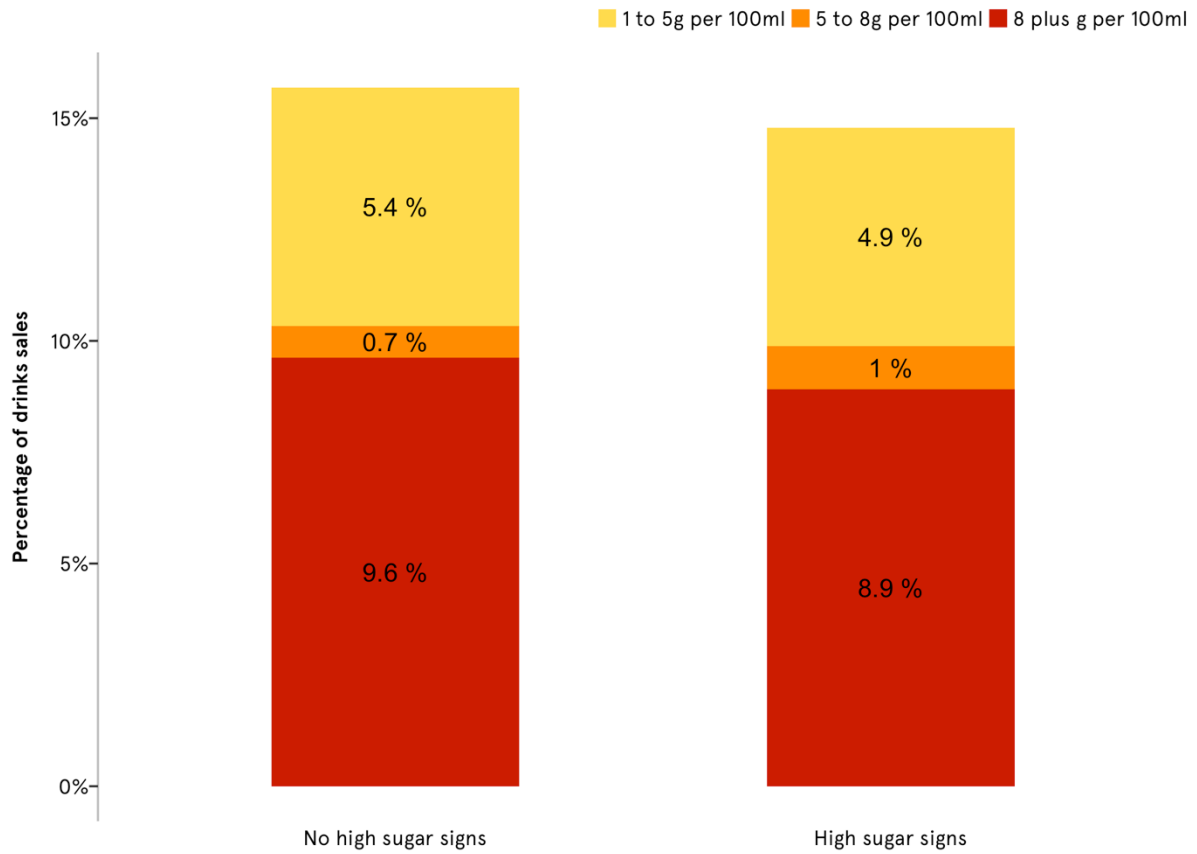

Figure 5. Sales for different categories of sugar content when the signs are or are not in place.

Trend in overall sales of high sugar drinks during the trial period: Sales of high sugar drinks as a proportion of total sales had been declining in the three stores participating in the trial in the 12 months before the trial. However, as shown in Figure 6, there appears to be a marked decline in the Broadgreen store in particular during the trial.

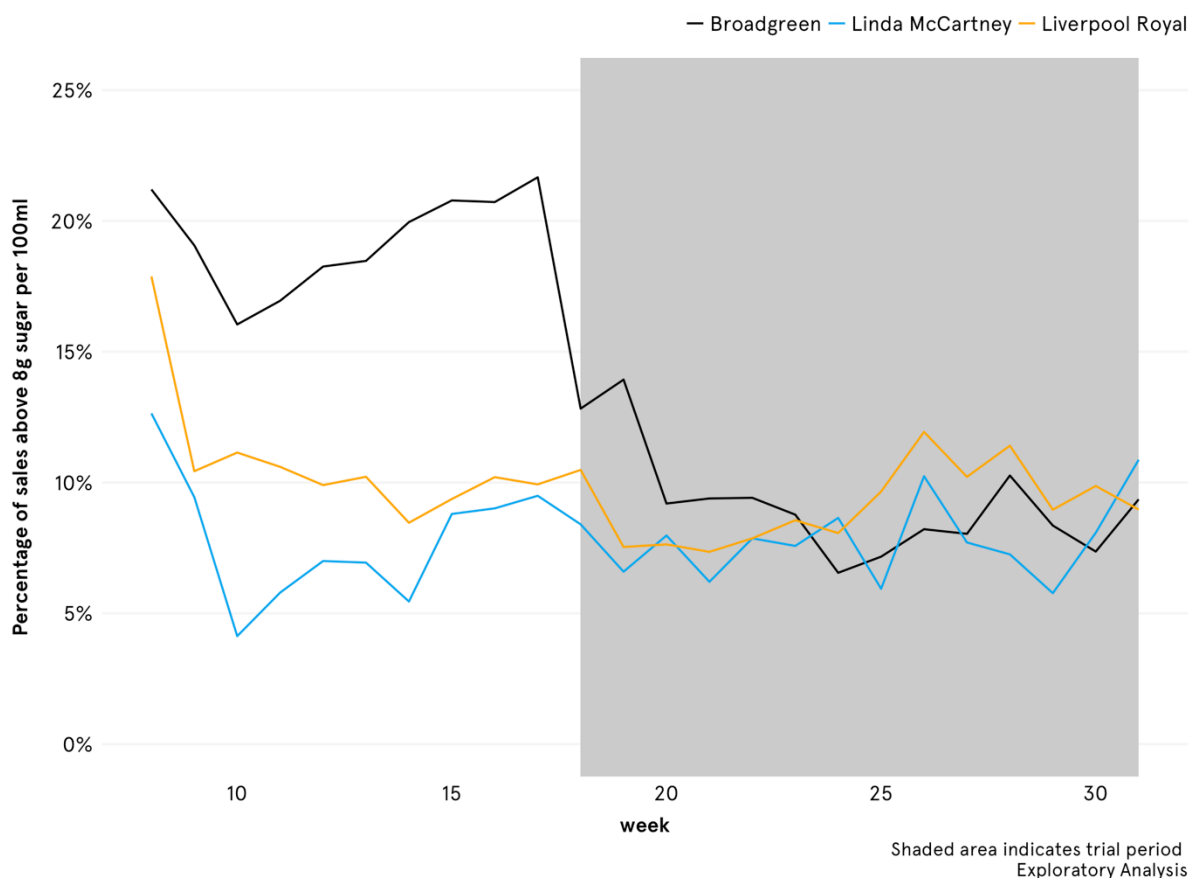[5] It should be noted that this is not a statistically significant difference.

Figure 6. Trend in percentage of high sugar sales before and during the trial period.

In the exploratory analysis we measured the change in high sugar drinks as a proportion of total sales in the 10 weeks before the trial and the 14 weeks during the trial. Figure 7 shows that there were statistically significant declines in the Broadgreen and Royal Liverpool stores.

Next steps

These results suggest that such an intervention could be introduced to other areas of the public sector including leisure centres, railway stations and other hospitals across local authorities to reduce purchasing and consumption of high sugar products.

"Tackling sugar in diets is a real priority for us because we know that people simply don't realise how much they are consuming. Most people don't have the time to read labels or understand the information given on them when buying drinks so we have to support them to make healthier choices. The amount of sugar in many soft drinks is shocking with some

containing over 13 sugar cubes. If we are to stand any chance of tackling the obesity time bomb we must give people as much help as possible. Liverpool are delighted with the results of this pilot and will look to see how we can use in other settings."

Sue Cumming, Head of Behavioural Insight & Change, Liverpool City Council