

# How to Get Those Recycling Boxes Out: A Randomised Controlled Trial of a Door to Door Recycling Service

## FINAL REPORT

Sarah Cotterill, Peter John, Hanhua Liu and Hisako Nomura  
Institute for Political and Economic Governance (IPEG)  
University of Manchester  
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Sarah Cotterill, Peter John, Hanhua Liu and Hisako Nomura  
Institute for Political and Economic Governance, School of Social Science, University of  
Manchester, Manchester, M13 9PL 0161 275 0792 sarah.cotterill@manchester.ac.uk

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## Executive Summary

# REDISCOVERING THE CIVIC AND ACHIEVING BETTER OUTCOMES IN PUBLIC POLICY

## Policy Briefings Number 1

**Title:** How to Get Those Recycling Boxes Out: A Randomised Controlled Trial of a Door to Door Recycling Service

- The first randomised controlled trial (RCT) to study the impact of a canvassing campaign on household recycling over time. A randomised control trial is a robust method for establishing whether an intervention works. It involves: two or more comparison groups that are similar in all respects; the random allocation of households to one or other group; one or more group receives an intervention, but otherwise all the groups are treated the same; observations are made of all members of the groups before and after the intervention.
- Research was done in partnership with EMERGE, a social enterprise organisation which delivers a weekly kerbside recycling service in Trafford.
- Recycling participation rates for 6580 households in two neighbouring inner-city districts of Trafford were measured by observing bin set out rates over a three week period.
- Half of the streets were randomly assigned to be canvassed. Half of the streets were placed in a control group and received no special attention.
- All households in the canvass group were visited by canvassers who were trained to promote and encourage recycling.
- Recycling participation rates for all households were measured after the canvassing campaign and then again three months later to see if the intervention had been effective in raising participation rates.
- Multiple deprivation scores and ethnicity of the 15 super output areas in the research area were used to examine the impact of canvassing on recycling behaviour in different neighbourhoods.

## Key Findings:

- A door-to-door canvassing campaign can raise recycling in the short term by 5%\*, compared to a control group. The effect, however, declines three months later (\*  $p < 0.05$ ).
- Canvassing had less impact on streets where recycling rates were already very high.
- Recycling rates overall were lower in the more deprived super output areas. The canvassing campaign was more successful in the poorer super output areas than it was in the less deprived areas.
- The canvassing campaign was particularly successful in areas with a large ethnic minority population.
- The canvassing campaign cost £24.06 for each additional household that started recycling.

## Policy Relevance and Implications:

- A canvassing campaign can successfully raise participation in a kerbside recycling scheme by 5%.
- The effect is still there three months later, but is reduced to 2%. This might suggest that canvassing and other promotional campaigns be repeated regularly to reinforce the recycling message.
- Canvassing campaigns are likely to be most successful if targeted in:
  - streets with low baseline recycling rates, or
  - relatively deprived areas, or
  - areas with a high ethnic minority population

### Further information available from:

**Email:** Dr Sarah Cotterill, Research Associate  
[sarah.cotterill@manchester.ac.uk](mailto:sarah.cotterill@manchester.ac.uk)  
**Telephone:** 0161 275 0792  
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# **How to Get Those Recycling Boxes Out: A Randomised Controlled Trial of a Door to Door Recycling Service**

## **1. Introduction**

Creating environmentally positive outcomes is a massive task for the twenty-first century as societies across planet face the challenge of dealing with climate change and disposing of the products of an increasingly consumerist society. It is possible that much of the change will happen through awareness of the problems, in reaction to market incentives or in response to information and regulation from government and other actors. With some activities, such as change in car use, it is hard to imagine such a change taking place without a considerable effort in persuasion or large incentives, but many other activities, including kerbside recycling, require modest lifestyle adjustments, with canvassing being potentially effective at bringing about behaviour change.

This report outlines the findings of a randomised controlled trial conducted by IPEG and EMERGE in Old Trafford and Gorse Hill, Greater Manchester in March – October 2008. Recycling participation rates for 6580 households were measured by observing bin set out rates over a three week period. Half of the streets in the area were randomly assigned to receive an intervention to encourage recycling. All households on these streets were visited by canvassers who were trained to promote and encourage recycling. Half of the streets were placed in a control group and received no special attention. Recycling participation rates for all households were measured after the intervention to see if the intervention had been effective in raising participation rates.

Our research study is unique in that it is the first field experiment to test the impact of a door-to-door canvassing campaign on household recycling and it is the only experiment to look at recycling over the longer term, measuring the impact of a recycling campaign some months after the intervention.

## **2. Research Aims**

The central research question is whether, to what degree and for how long a door-to-door campaign can raise the recycling level. In our three wave experimental study, we sought to answer two questions:

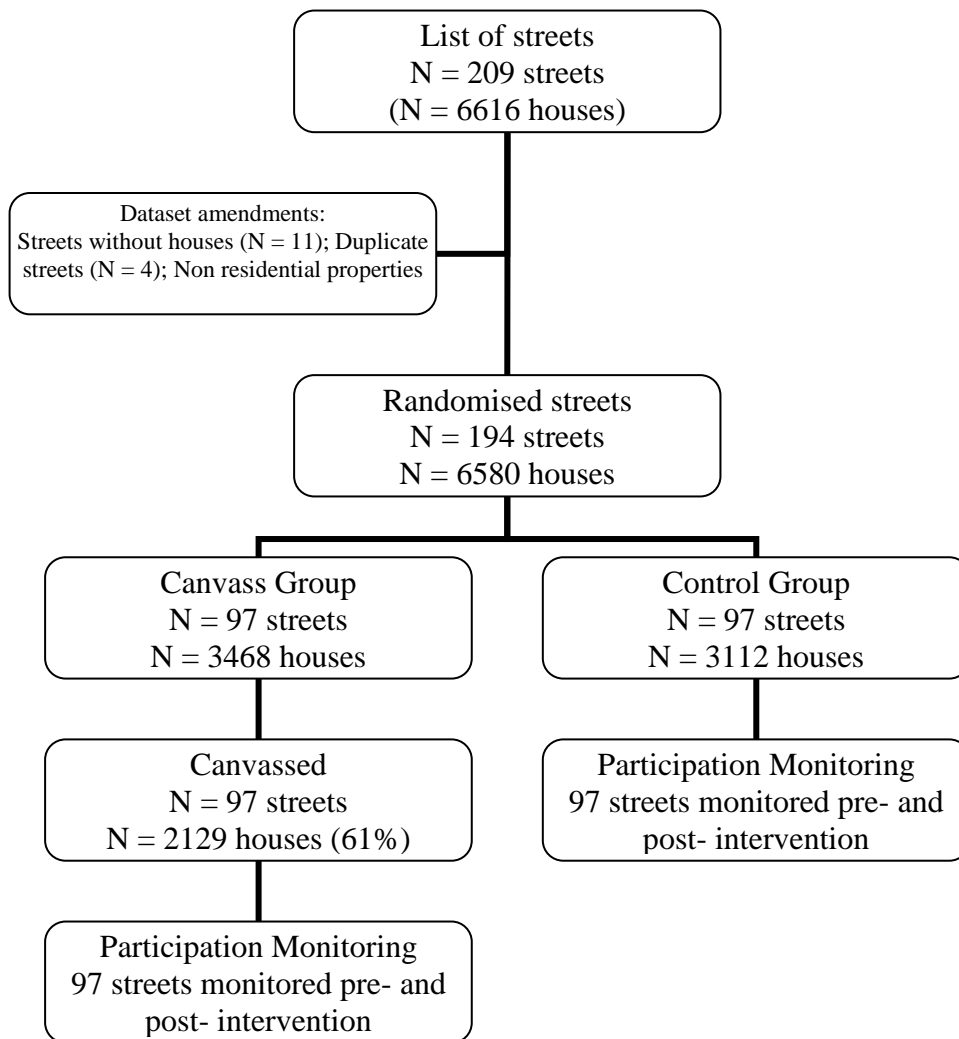
1. Does canvassing lead to a rise in recycling participation?
2. Is the rise in participation sustained over time?

## **3. Research Design**

The research was conducted in two adjoining neighbourhoods, Old Trafford and Gorse Hill, which are within Trafford metropolitan borough council, close to inner city Manchester. The housing is a mixture of terraced and semi-

detached houses. The area is relatively deprived and ethnically diverse compared to other areas nationally. A kerbside recycling service is provided by EMERGE, a not for profit organisation which is commissioned by Trafford metropolitan borough council to provide a weekly recycling service to all 6580 households.

Figure 1 CONSORT Participant Flow Diagram



### Street-based research design

All streets in Old Trafford and Gorse Hill who receive a recycling service from EMERGE were included in the research study. There are a total of 194 streets, with 6580 households. Streets vary in size from 2 households to 190, with an average of 33.9 households per street. Flats and commercial properties are not included because they are not eligible for the recycling service.

The list of streets was randomly divided into two groups of equal size, one to be canvassed and the other to act as a control. The data was stratified by

district (Old Trafford or Gorse Hill) and street length prior to randomization.<sup>1</sup> The treatment group contained 3,468 households in 97 streets and the control group contained 3,112 households in 97 streets.

Random assignment to the intervention group or the control group was done at the street level rather than at the individual household level: we anticipated that canvassing one household might have an effect on the behaviour of its neighbours in the control group, which would contaminate the experiment. A street based design reduced the possibility of such contamination.

## **Canvassing**

One of four canvassers visited all households in the streets in the intervention group. The canvassing approach was developed by adopting good practice as identified in previous studies. It focused on three factors which are expected to influence recycling behaviour: awareness, attitudes and structural barriers.<sup>2</sup> Canvassers made sure householders were aware of the service by confirming the day and time of collection, explaining the variety of materials that can be recycled. They promoted positive attitudes to recycling and were enthusiastic about encouraging people to take part. They addressed barriers to recycling by providing any plastic bags as required and ordering new boxes if they were lost or missing. They dealt with any problems or queries about the service or passed any difficult queries onto an EMERGE manager. The canvassers were encouraged to be enthusiastic and conversational on the doorstep. They were provided with scripts to use as prompts but were encouraged to adapt them to their own conversational style (appendix 1).

Canvassers were asked to take a different approach dependent on whether the householders were currently recyclers or non-recyclers. Canvassers thanked existing recyclers for using the recycling box, reminded them of the variety of recyclable materials and asked any enthusiastic householders if they would like to become recycling champions. Canvassers took a slightly different approach with non-recyclers: encouraging them to recycle, promoting the day and date of collection and providing information on the materials collected before asking if they could be counted on to recycle regularly. Canvassers dealt with any questions or concerns about the service and took orders for replacement receptacles if they were broken or missing. An information leaflet was delivered to every household canvassed including those where no one was at home. The leaflet described what materials could be recycled, outlined the service provided, gave details of the time and day of collection and provided contact details for more information.

A log sheet was produced for each street (appendix 2). It listed every household on the street, with an indication of whether they currently recycle or not. Canvassers entered the date and times that the street was canvassed.

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<sup>1</sup> We thank Professor David Torgerson of the York Trials Unit, Department of Health Sciences, University of York, who executed the randomisation

<sup>2</sup> Shaw, P. J., Lyas, J. K., Maynard, S. J., & Van Vugt, M. (2007). On the relationship between set-out rates and participation ratios as a tool for enhancement of curbside household waste recycling. *Journal of Environmental Management*, 83, 34-43.

The information was used to monitor when the best times to canvass were and to ensure a different time for follow up visits. Canvassers completed the sheets to show which houses had been canvassed and whether additional bags had been provided and new box requests were entered. About 500 new boxes were requested. There was space to note if there was no one in the household who spoke English well enough for the canvassing to take place. The intention had been to re-visit these households with a translator, but the number of cases was lower than anticipated (29 households) and the number of languages was very varied, so the re-visits were not undertaken. Volunteer recycling champions were noted on the sheet and contacted by EMERGE at a later date. We found that 29 people had volunteered.

The four canvassers were specifically recruited and trained for the task. The canvassers received one day's training on the EMERGE recycling service, the benefits of recycling, possible arguments against recycling, canvassing issues and practical issues relating to health and safety. The canvassing took place over a period of six weeks in May and June 2008 between 3pm and 7pm Monday to Friday and 11am – 3pm on Saturday. These times were chosen to maximize the number of contacts, based on previous best practice.<sup>3</sup> Each street was canvassed twice. The second visits were arranged at a different time of day from the first visit to maximize contact. During the first canvass 40% of households were spoken to. By the end of the second canvass, 61% of households had been contacted, 2,129 of the 3,468 households in the intervention group. The contact rate compares favourably with other canvassing projects.

### **Participation Monitoring**

We measured recycling behaviour by observing which households put out a recycling container for collection. The monitoring was done on the same day as the waste collection. The monitor sat in the recycling vehicle while the crew were working and noted all the houses on the street that had placed recycling material outside the house boundary. The monitoring was repeated over three consecutive weeks: some households may not recycle weekly because of holidays or having low levels of recyclable waste. Any household who recycled at least once in the three week period was counted as a recycler. This followed the most recent guidance from the Waste and Resources Action Programme (WRAP), supported by the environment department, Defra.<sup>4</sup>

The participation ratio of each street was calculated as the proportion of households placing material out for collection at least one week in three:

$$\text{Participation ratio} = \frac{\text{No. of households placing material out for collection at least once in 3 weeks}}{\text{Total no. of households}} \times 100$$

Participation in the recycling scheme was measured for all households in the intervention and control groups at three time points: in March/April 2008 prior

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<sup>3</sup> WRAP. (2006). Step by step guide to door –to-door canvassing. <http://www.wrap.org.uk/> Access date: Mar 07, 2008

<sup>4</sup> WRAP. (2006). Improving the Performance of Waste Diversion Schemes: A Good Practice Guide to Monitoring and Evaluation. <http://www.wrap.org.uk/> Access date: Mar 07, 2008

to the canvassing, in July 2008 after its completion and in October 2008 to test the habit effect. Monitoring was not done at bank holidays (because services were disrupted) or during school holidays (when some households might be away).

The three sets of participation monitoring were each done by a different person, none of whom were involved in any other aspect of the project, and who were unaware which streets were in the treatment and control groups. The members of the recycling collection crew were aware of the research project, but did not know which streets were in the treatment and control groups.

#### 4. Research Findings

##### Was the canvassing successful?

Table 2 compares the recycling participation ratio of the control and canvass groups over time.

Table 1: Recycling participation rate at each time point, by group

	Baseline March 2008	1 <sup>st</sup> follow-up July 2008	2 <sup>nd</sup> follow-up October 2008
Canvass group	48%	52%	53%
Control group	54%	53%	57%

At baseline, in March 2008, before the canvassing took place, the canvass group had a participation ratio of 48%, compared to a participation ratio of 54% of the control group. By July, immediately after the canvassing, the recycling participation ratio of the canvassed streets rose to 52%, a rise of 4% and participation in the control group dropped to 53%, a fall of 1%. The randomisation of the two groups means that the streets in the canvass group are the same as those in the control group in every respect except for having been canvassed, so we should assume that – without the canvassing - the recycling rates of the canvass group would have fallen by 1%, the same as the control group. So, overall the short-term effect of the canvassing campaign was to raise recycling by 5% (4% + 1%).

<b>Key finding 1</b>	<b>Recycling participation rose by 5% amongst the canvassed streets compared to the control group.</b>
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Between the baseline monitoring in March 2008 and the follow up monitoring in October, the participation ratio of the canvassed streets rose from 48% to 53%, a rise of 5% and the control group rose from 54% to 57%, a rise of 3%. So, overall the longer-term effect of the canvassing campaign was to raise recycling by 2% (5%-3%).

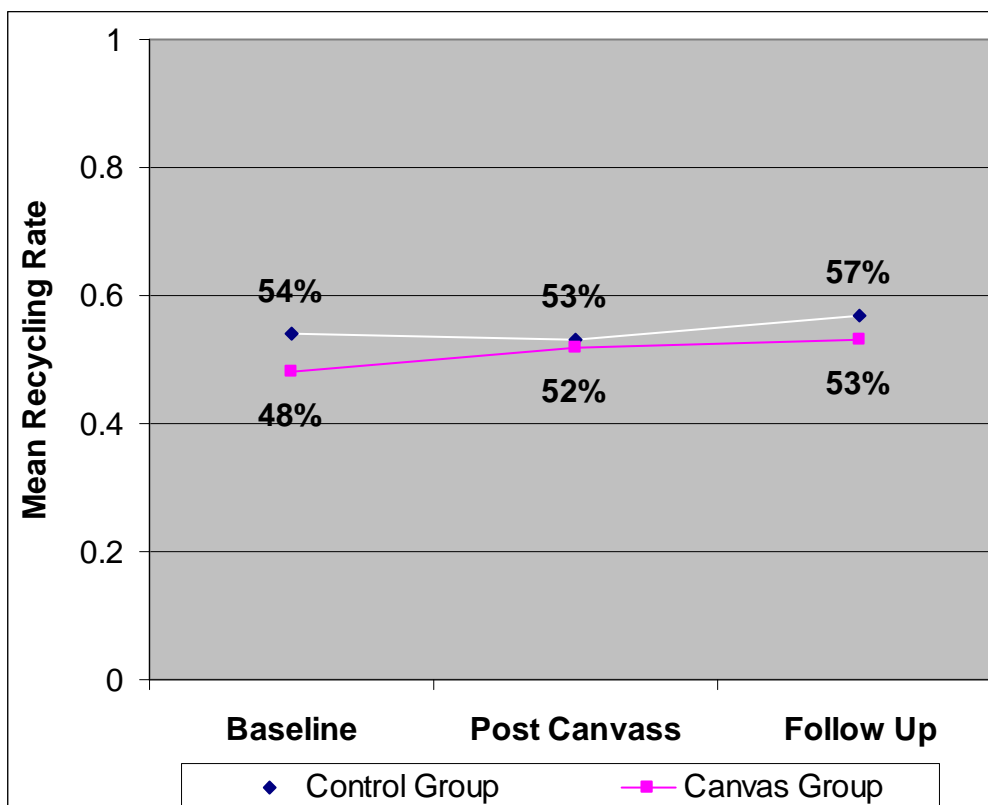


Figure 1. Recycling participation rate by group

<b>Key finding 2</b>	<b>3 months after the canvassing recycling participation rose by 2% amongst the canvassed streets compared to the control group.</b>
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Similar canvassing campaigns conducted by WRAP have led to immediate rises in participation of 9.6% in Braintree District Council (estimate based on provisional results), 6.5% in Essex and 7% in Luton Borough Council. However, none of these studies included a control group, so there is no way of knowing whether these rises were the result of the canvassing or some other factors and none included a follow up measure to test the impact over time.<sup>5</sup> The only academic study of a canvassing campaign found an overall fall of 4%, but again there was no control group.<sup>6</sup> Randomised controlled trials similar to this one have found that providing written feedback on recycling performance can raise recycling participation by 6-7%<sup>7</sup> or 2%.<sup>8</sup>

<sup>5</sup> WRAP *Step by Step Guide to Door-to-Door Canvassing, case studies*  
[http://www.wrap.org.uk/local\\_authorities/toolkits\\_good\\_practice/guide\\_to.html](http://www.wrap.org.uk/local_authorities/toolkits_good_practice/guide_to.html)

<sup>6</sup> Timlett, R. E., & Williams, I. D. (2008). Public participation and recycling performance in England: A comparison of tools for behavior change. *Resources Conservation and Recycling*, 52(4), 622-634.

<sup>7</sup> Schultz, P. W. (1998). Changing Behavior With Normative Feedback Interventions: A Field Experiment on Curbside Recycling. *Basic and Applied Psychology*, 21(1), 25-36.

Table 2. Neighbourhood Statistics for Old Trafford and Gorse Hill

		Old Trafford	Gorse Hill
Ethnicity (2001 census)	White	53%	87%
	Non white	47%	13%
Multiple Deprivation Score (higher score indicates more deprived) (2007)		41.7	30.6
Housing type (ONS 2004)	Detached	4%	3%
	Semi-detached	42%	44%
	Terraced	38%	45%
	Flats and other	16%	8%
All data from ONS <a href="http://www.neighbourhood.statistics.gov.uk">http://www.neighbourhood.statistics.gov.uk</a> accessed 17/09/08			

### Recycling and Deprivation

Recycling is affected by household characteristics. Surveys indicate that non-recyclers tend to be younger, less affluent and live in rented accommodation, while recyclers, in contrast, tend to be more mature, more affluent, home owners and better educated. It may be that households from lower socio-economic groups tend to devote less effort to recycling because their economic and social deprivation mean they face more pressing needs.<sup>9</sup>

Our research took place in Old Trafford and Gorse Hill, two adjoining areas which are within the Clifford, Gorse Hill and Longford wards of Trafford. These areas are relatively deprived in national terms, but Old Trafford has a higher mean index of multiple deprivation score of 41.7, compared to Gorse Hill, which has a mean score of 30.6. A third of the super output areas in Old Trafford lie within the 6% most deprived areas of England.

Table 3: Recycling participation before the canvassing, by deprivation

	Canvas Group	Control Group
Most affluent areas IMD score under 35	52%	57%
Medium areas IMD score 35-44	54%	52%
Most deprived areas IMD score over 44	38%	49%

To examine the relationship between recycling and deprivation we compared the index of multiple deprivation scores for each of the 15 super output areas in Old Trafford and Gorse Hill to the recycling rates of those areas before the start of the canvassing campaign (table 3). The results indicate that streets in

<sup>8</sup> Lyas, J. K., Shaw, P. J., & Van Vugt, M. (2004). Provision of Feedback to Promote Householders' Use of a Curbside Recycling Scheme - A Social Dilemma Perspective. *Journal of Solid Waste Technology*, 30, 7-18.

<sup>9</sup> For a review see: Martin, M., Williams, I. D. & Clark, M. (2006) Social, Cultural and Structural influences on Household Waste Recycling: a Case Study. *Resources, Conservation and Recycling*, 48, 357-395.

super output areas with the highest levels of deprivation participate less in kerbside recycling. Among the streets to be canvassed, only 38% of households were recycling at the start of the research, compared to 52% of households recycling in the most affluent areas.

**Key finding 3**    **Recycling rates are lower in the more deprived areas.**

Having found that recycling rates are lower in the more deprived areas, we are then interested to see whether the canvassing can be successful in encouraging households in those poorer areas to start recycling.

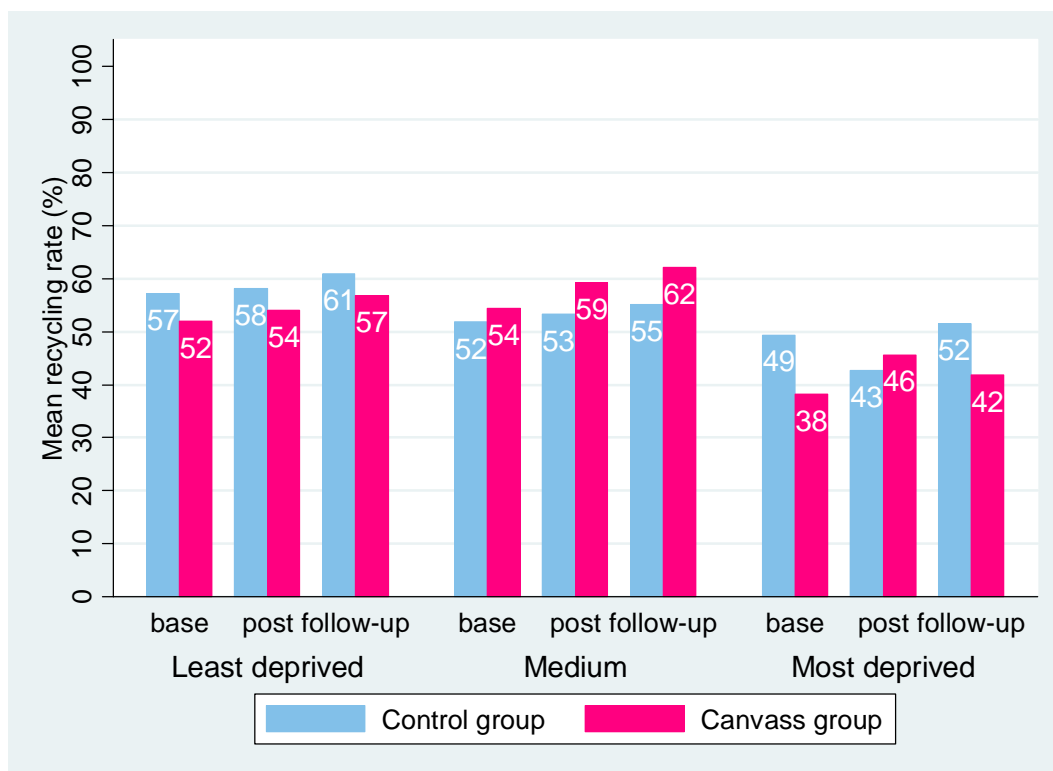


Figure 2: Recycling rate by deprivation level

The least deprived streets already have a higher proportion of recycling households and the canvassing did not have much impact on them: the participation rate of the canvassed streets rose by about the same amount as the streets that were not canvassed. The streets with medium levels of deprivation responded well to the canvassing campaign. The recycling rate of the canvassed streets in the medium areas rose by more than the non canvassed streets: they increased from 54% to 59%, and then the rate steadily improved to 62%. The streets with highest levels of deprivation experienced the largest immediate response to the canvassing campaign, up from 38% of households recycling to 46%, a rise of 8%. But the habit of recycling did not stay with this group and the recycling rate of the canvassed

streets in the highly deprived areas dropped down to 42%, although still higher than the original rates.

<b>Key finding 4</b>	<b>Canvassing is particularly effective in the areas of medium or high deprivation but the effect in the most deprived areas is short-lived.</b>
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### **Recycling and Ethnicity**

Levels of ethnic diversity vary across the area of the research study. The size of the ethnic minority population ranges from 10% to 66% in the fifteen super output areas that make up the area. Old Trafford has a larger ethnic minority population (47%) than Gorse Hill (13%). The largest ethnic group is Asian/Asian British, including households of Pakistani and Bangladeshi origin. There is also a sizeable Black/Black British population. The areas with a high proportion of ethnic minorities coincide – but do not totally overlap - with the areas of high deprivation.

We compared the proportion of the population that was non-white in each of the 15 super output areas in Old Trafford and Gorse Hill to the recycling rates of those areas before the start of the canvassing campaign. After taking account of the levels of deprivation, we found that the streets in super output areas with a high ethnic minority population participate slightly more in the kerbside recycling scheme than those in nearby areas that have a smaller proportion of ethnic minorities.

The canvassing was more successful in areas with a higher ethnic minority population than it was in less diverse areas. The streets with a medium and high ethnic minority population responded well to the canvassing campaign with recycling rates rising by 7% immediately after the campaign. In the streets with a lower ethnic minority population the participation rate of the canvassed streets fell immediately after the campaign, in a similar pattern to the control streets.

But the habit of recycling did not stay with these streets and in the most diverse areas there was no effect three months later.

<b>Key finding 6</b>	<b>Canvassing is particularly effective in areas with a high proportion of ethnic minorities, but the effect is short-lived</b>
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We can speculate that transience may be an issue here. It is likely that neighbourhoods with a high proportion of ethnic minorities also have a high population turnover. Households moving to an area for the first time are unlikely initially to understand the local waste management system and they may have more immediate demands on them than mastering a system involving a number of different waste containers and collection days. In these

circumstances, it might be advantageous for service providers to target canvassing campaigns in areas of high population turnover, to remind them of the way the scheme works.

### The Impact of canvassing on streets with high or low recycling rates

There is a wide variation in the baseline recycling rates of different streets, ranging from streets where 0% of households recycle to streets where 100% of households recycle (figure 3). Among the streets with the lowest baseline recycling rates the canvassing had some impact, with recycling rising slightly in the short term, but there was no impact three months later. Among the streets with the highest baseline recycling rates the canvassing had no effect: the canvass group’s recycling rates mimic those of the control group. The canvassing campaign had most impact on the streets with medium recycling rates: in these streets the recycling rate rose from 50% to 57%, while the control group remained static, but this effect did not sustain three months later.

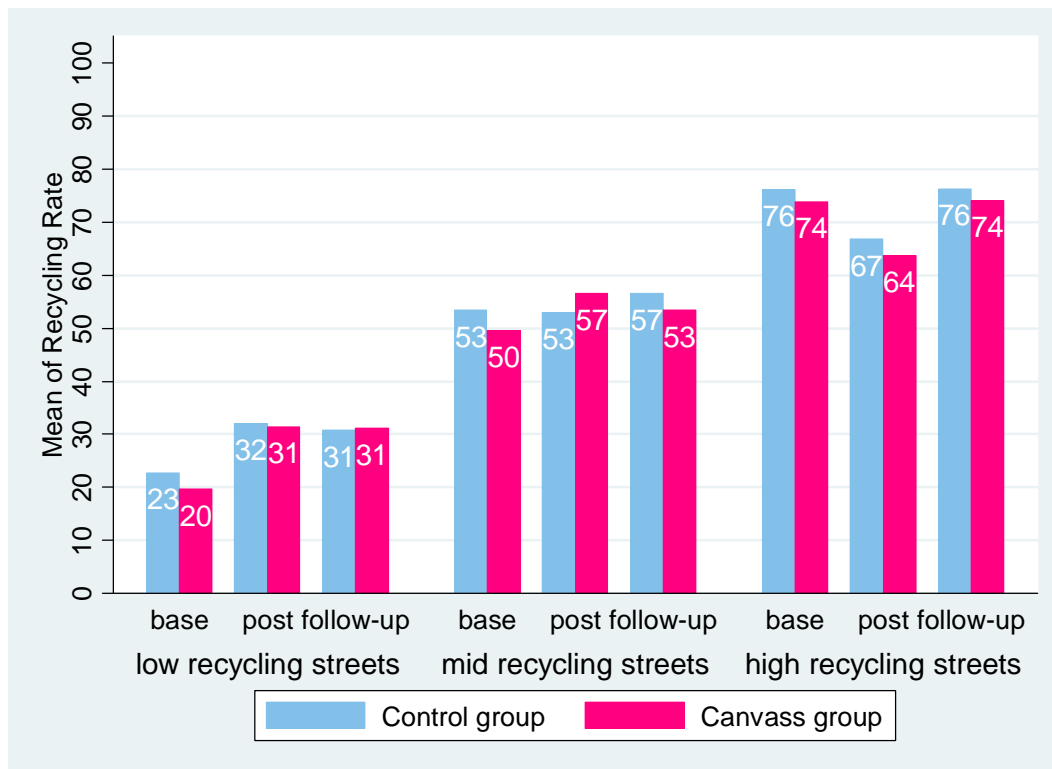


Figure 3: The impact of canvassing on streets with different levels of recycling

<b>Key finding 7</b>	<b>Canvassing has less impact on streets with very high or very low recycling rates</b>
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## Costs

The cost of carrying out the canvassing was £5605.59. This included the wages for four canvassers, additional wages paid to an EMERGE manager to supervise the team out of office hours, refreshments for the training day and the cost of calls made on the team's mobile phone. Other additional costs incurred during the project include the additional recycling bags and boxes and the safety jackets provided to the team, but these are part of the usual spending of EMERGE and so have not been included. The costs of the participation monitoring and other research costs have not been included.

Immediately after the canvassing, 233 additional households from the intervention group started recycling. The cost per additional household is £24.06.

<b>Key finding 7</b>	<b>Canvassing cost £24.06 for each additional household that started recycling.</b>
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## The Recycling Service

The EMERGE recycling service collects a very broad variety of materials: households have a box (for glass bottles, cans, thin card, directories and textiles) with three separate bags for paper, plastic bottles and batteries. The box system offered here is probably easier for the terraced households, where wheeled bins are problematic because of storage and access issues, but boxes may be less convenient for houses with driveways. Households have a weekly recycling collection. About sixty per cent of households have their recycling collected on the same day as the council does its residual waste collection, so some households may have collections on two different days each week. The vehicle collecting recycling waste is visibly different from residual waste collection vehicles and materials are sorted as they are placed in the van, giving a clear message that the service is trustworthy and recyclables will not end up in landfill sites. If households leave out contaminated boxes (including non-recyclable waste or placing waste in the wrong containers), they are left with a card explaining how the service works.

Citizens often regard their own behaviour change as part of a contract with expectations on both sides: if citizens are to consider changing their behaviour, they will have high expectations about the behaviour of public agencies. The canvassing in May/June 2008 coincided with a period when the recycling collection crew was short-staffed and there was a reliance on casual staff. The canvassers found that there were a minority of householders who complained of missed collections, rude staff, dirty boxes and pedantry over contamination. These households had given up on recycling altogether and had to be persuaded to restart. Canvassers felt they had to win people round who were fed up with the service, as one canvasser commented:

“[if] collections weren't right or something went wrong or they got disenchanted because they don't get their bin back or they are confused about how things should be sorted ... we have tried to persuade them to give it another go”.

The canvassers were negotiating a contract with the householder: persuading people to recycle in expectation that the service would be better than before.

By the time of the final monitoring in October 2008, a permanent and settled collection crew were in place, which we would expect to have an impact on recycling participation levels.

The summary statistics in Table 2 show that the recycling participation rate in the control group fell by 1% between March and July 2008 but then rallied to achieve an overall rise of 3%. This indicates that something outside the experiment caused recycling ratios to dip immediately after the campaign, but to rise three months later to higher levels than before the campaign. We can speculate that this change might be due to changes in satisfaction with the recycling services.

## **5. Discussion and Conclusion**

The research never started out with the expectation that canvassing would lead to radical changes in behaviour because the intervention is modest. But the campaign has had positive effects. The results of the experiment show that a door-to-door campaign can raise recycling in the short term by 5%, compared to a control group, although the effect drops to 2% three months later. In terms of making an inference outside the study area, we should bear in mind that this is in an inner city area where the recycling service is comprehensive, and where there are terraced and semi-detached houses which are easy to canvass, so it may be the case that other areas either have more potential for recycling or less by this method - we cannot know. But such results are consistent with existing observational studies and with the effects of door-to-door canvassing for other contexts.

We found that recycling rates were lower in the more deprived areas and that canvassing can alter this imbalance: the canvassing campaign was more successful in the poorer areas than it was in the more affluent areas. Recycling rates were slightly lower in areas with a larger ethnic minority population and the canvassing was particularly successful in those areas. We can speculate that this might be because of higher levels of population turnover in areas with lots of ethnic minorities, creating a greater need for on-going reinforcement of the recycling message. Canvassing has less impact in streets where recycling rates are already high. The canvassing campaign cost £24.06 per additional household that started recycling.

We did not set out to evaluate the recycling service, but it appears from our study that there may be a relationship between service quality and recycling. When the service was being delivered by an irregular team the canvassers picked up on some discontent among householders and this coincided with a time when recycling rates were relatively low. Three months later, when a permanent team was in place, the recycling participation rate was higher, even among the control group. This is a tentative finding and further research could usefully explore the impact of service quality on recycling participation.