

Non-Standard Matching in Charitable Giving – null results from two field experiments¹

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Abstract:

Many charities make use of ‘matches’ on donations made by their supporters as a way of encouraging more and larger donations. The effectiveness of these matches in the field has been tested elsewhere, but it is unclear whether the current ‘standard’ matching formulation is the most effective. In two field experiments, we test different formulations of a matching programme against no match and a standard match. In both studies, which are administered digitally using email and social network sites, we find no statistically significant effects of any match (including the standard match) compared with the control condition. Taken together, these findings suggest that while matches can be effective, their effectiveness may depend on contextual factors and the type of donors being solicited.

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Introduction

In recent years, there has been growing interest in the social incentives that affect altruistic behaviours, particularly charitable giving, stimulated by work by public economists (e.g. Andreoni 1990). These findings have been picked up by policy-makers and charities as ways to increase charitable giving. It is now well established that the act of giving is affected by the extent to which the donor takes account of the action of others, with social incentives often increasing the extent to which people are willing to donate. There are a good number of trials that show the extent to which matching can increase giving (for example. Eckel and Grossman 2008). Fundraisers should be confident that introducing matches in charitable giving campaigns will increase the level of funds generated.

In many fields with direct policy applications it is desirable that enough studies should have been completed for a meta-analysis which can offer more reassurance to policymakers. In the case of matching in charitable giving it is unlikely that enough studies with the same design will be soon completed to be able to carry out a systematic review. The question arises as by how much can we make generalisations in the absence of a large number of studies, particularly in the event that publication is skewed towards positive findings. In this case, results of experiments in which matches have been ineffective can set out the limits of external validity, which is an important contribution to made available to the stock of academic knowledge and helps avoid the familiar problems of the “file drawer” and selection bias. Such experiments may also reveal features of the implementation process that impinge on the results and findings from such interventions, such as details about the treatment was received that may also add to research knowledge.

This paper considers the contribution of studies that test for matching but fail to find the expected effects. We report the results of two small scale randomised controlled trials in non-standard matching. The structure of this paper is as follows: in the sections that follow we describe the design of experiment one, and report the results of this experiment; following this, we describe the design of experiment two, and report the results of this experiment; and finally, we pool our data where appropriate and conduct analysis on our pooled sample.

Theory and Previous Studies

Matching funds is one kind of social incentive and provides a stimulus to increase giving if another actor matches the giving of the donor or fundraiser. There may be a psychological effect as the signal from another outside person or agency may engender more enthusiasm for charitable work. Response by donors to matches may also be regarded as a form of conditional cooperation between actors (Frey and Meier 2004).

Economically, the theory of matching is straightforward - a credible or binding offer to match donations by a certain amount is the equivalent of a change in the price of

giving - in effect a subsidy. Conceptually, we can think about something charities produce - for example mosquito nets. Imagine a charity which does nothing but provide these mosquito nets where they are needed, which has no fixed costs, and for whom the price of providing each mosquito net is \$5. For the prospective donor, who is motivated by the desire to do some good in the world, the price for each net purchased (and the commensurate good that will do), is \$5. When deciding whether and how much to donate, this donor must decide how much she values the good done by the net, and compare that to how much she values the other possible uses of \$5. When a match, let's say 1-1 is introduced, the cost to the donor of doing the same amount of good is now \$2.50. If charitable giving is a 'normal' good (whereby demand rises with income and falls with price), the prediction is clear - matching will lower the price of giving and so the total amount of the good purchased will rise - there will be more mosquito nets. What is not so clear is the effect on the donations made excluding the match. Typically, we assume that donors have diminishing marginal returns to all goods, including donations to charities. The first unit of a good (the first mosquito net purchased) provides more satisfaction to the donor than the second, which provides more satisfaction than the third, and so on. The result of this in the matching example, is that if our donor is giving \$20 from his pocket without the match (donating 4 nets), it is possible that he will give less from her pocket with the match - perhaps \$30 (donating 6 nets). In the world before the match, the donor will continue giving until his value for the good done by an additional net drops below the \$5 cost of that net, while in the world after the match he will continue giving until his value for the good done drops below \$2.50 - the new cost - this could either be higher or lower than \$20 from his own pocket. It is important for charities that are given pots of money that might be used for match funding to know whether the total amount donated by the donor will rise or fall - as this determines whether the match will be beneficial or costly to the charity overall.

There is a sizeable empirical literature testing matches, which derives from early laboratory experiments (see Eckel and Grossman 2003, 2008). Even this early work went beyond what is called standard matching, which matches pound for pound, to examine the impact of different levels of match (e.g. Blumenthal 2013, Davis et al 2005, Karlan et al 2011). Related work tests responses to fundraising when a large donor makes a donation (Huck and Rasul 2011). Over time such work has got more complex seeking to estimate different kinds of matches as well as the amount, such as Sanders et al (2013) work on non-linear matching, social (and team) matching, and lottery matching. The work for this project builds on the current research seeking to vary the matches in the treatment arms.

Methodology: Experiment 1

Experiment one was focused on whether various forms of matching increased donations from the Facebook friends of fundraisers. The fundraisers contacted their friends either via direct email or via Facebook messages to groups of their friends⁶. The trial consisted of four variants of a message requesting charitable donations. They were identical apart from the type of matching provided by the fundraiser's employer.

In these messages, participants were asked to make donations through a Just Giving donation page. Just Giving is an online donation platform on which donors can make contributions to charities. The majority of funds raised through this platform come through 'sponsorship' whereby fundraisers commit to undertake some action - running a marathon, skydiving, or waxing their legs (more commonly in the case of male fundraisers) - and ask their friends and families to support them. Thus far hundreds of millions of pounds have been donated through this platform, and so requests made to donate through it are not unusual. Donations to this platform have also been shown by prior research (most prominently by Smith et al, 2014) and Rahaini and Smith, 2015), to be influenced by relatively small changes in the social information provided.

Through this design, lists of friends were exported from Facebook for each individual fundraiser. Within each fundraiser set, potential donors were randomised into four groups. Participants in each group received one of the interventions.

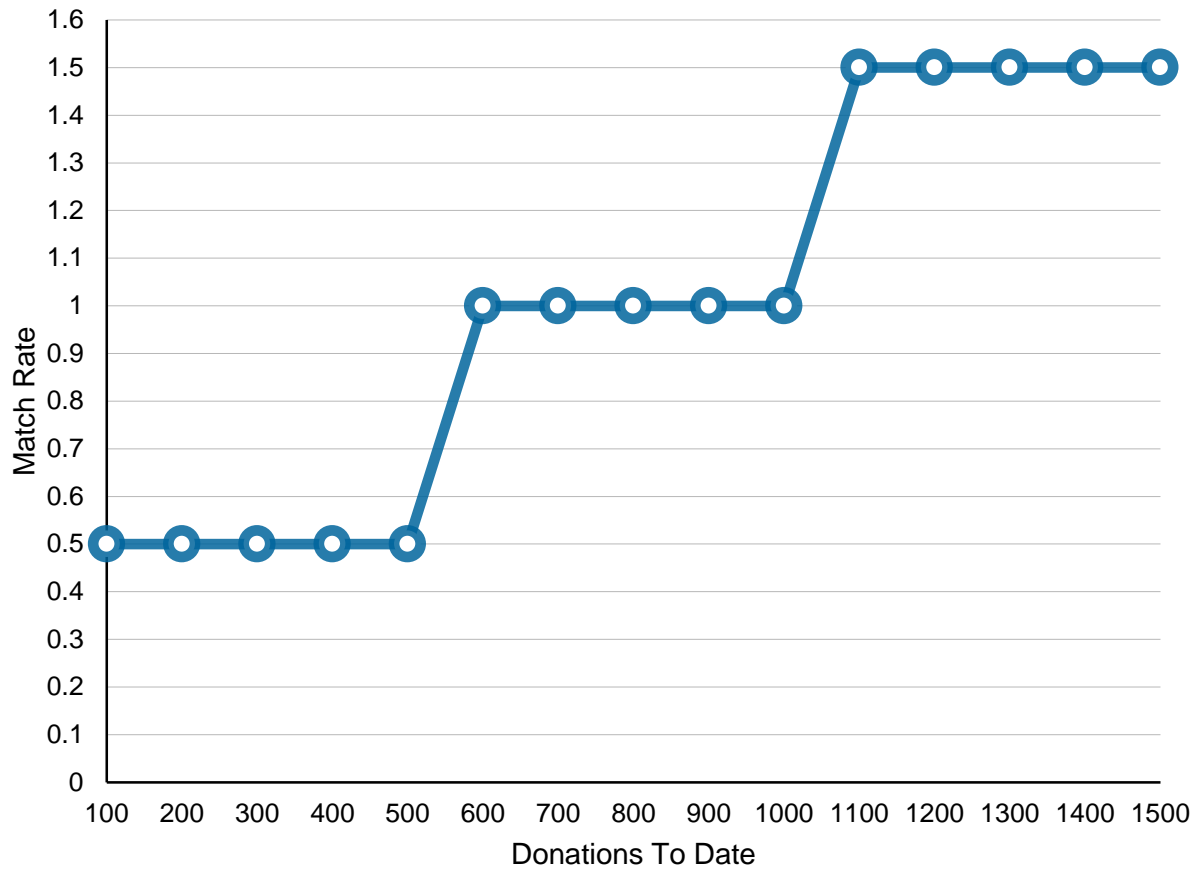
There were three treatment arms in addition to the baseline of the control condition, as can be seen in the table below.

The standard match appropriated a common form of matching, as used in studies elsewhere - for example Karlan and List (2006), and Huck and Rasul (2011). The competitive match and increasing match arms were chosen based on behavioural scientific principles. People have been shown to exert more effort and to commit more something when being asked to do so in a competitive context. Additionally, we might expect a competitive match - in which one community of donors are pitted against another, to have an impact on the social incentives of the members of each community, making them more likely to donate and to donate larger amounts in order that their group might win.

The increasing match functions by raising the marginal value of donations after a certain point, and providing a strong incentive for participants to aim for a given target. Participants in this group are told that if their donations cumulative rise above £500, the match available will rise from 50% to 100%, and that this will rise for

⁶ Initially, direct email was the preferred mode of communication, however high volumes of failed deliveries (>60%) for a number of the fundraisers led to the alternative approach of contacting people via group messages on Facebook.

additional donations above £1000 to 150%. The incentive for each marginal pound is



increasing at the increments - a representation of this is shown in the figure above.

Collectively, this match scheme acts as a 'bulk discount' scheme, where purchasing a greater volume of the good increases the discount available. In the context of a time limited fundraising campaign such as those carried out through JustGiving, this has the additional potential benefit of meaning that later donors, who typically are less motivated to donate and donate less (Smith et al, 2014, Sanders & Peacey, 2013), receive the greatest match rate (discount).

Table 1: Treatment condition descriptions		
Arm	Intervention	Description
1	No match	Donations will not be matched.
2	Standard match	Donation will be matched £1-£1 up to £1500.
3	Competitive match	Fundraisers will be split into two groups. The group that raises the most amount of money will have their donations matched up to £1500.
4	Increasing match	For the first £500 raised, they will match 50% of the donations, for the second £500 (i.e. £501-£1,000), they will match 100% of the donations, and for any cumulative donations of £1,000+ they will be matched at 150%.

The specific text for these arms was largely the same, as mentioned previously; however they varied to the extent that donations were matched.

The core text for the message was as follows:

Hi there,

A team of us from work are doing the Tough Mudder challenge on May 2nd. This is a gruelling 10-12 mile obstacle course, which includes electric wires and lots of mud.

As part of this, we are raising funds for a fantastic charity, [insert charity name], which is evidence-based and makes a huge difference to its beneficiaries. Work is covering the costs of the event, so all donations will go directly to the charity.

[Additional paragraph for treatment arms]

If you would like to help us meet our target of £3,500, please donate here:

[Link for donation page of charity]

The additional paragraphs for each treatment arm were:

Standard matching

In addition, my company has agreed to match all donations £1 for £1 (up to a max. of £1,500).

Competitive matching

And in addition to the above, my company has agreed to match all donations of the group that raises the most amount of money £1 for £1 (up to a max. of £1,500).

Increasing matching

In addition, my company has agreed to match all donations (up to a max. of £1,500). For the first £500 raised, they will match 50% of the donations, for the second £500 (i.e. £501-£1,000), they will match 100% of the donations, and for any donations above £1,000 they will match 150%.

Employees who were solicited via a company-wide email targeting those taking part in the “Tough Mudder” event, signed up to be fundraisers in the trial. Email addresses were generated from the list of friends (i.e. usernames were exported and email addresses were generated in the form of *username@facebook.com*). Fundraisers sent out four group emails to each of the respectively randomised groups of friends. The email messages asked recipients to donate money to the representative’s charity, either Malaria No More or the Schistosomiasis Control Initiative (details of the charities can be found in the appendix).

Unfortunately, a large portion of the initial email messages failed to deliver to their intended recipients. For each trial arm where >50% of the emails failed, fundraisers were asked to manually send group messages to their Facebook contacts via Facebook messages. This was necessary for three out of the seven fundraisers.

The primary outcome measures were then collected on whether people donated or not, the amount of money that they donated, and the click-through rates to the donation pages. Donation pages were set up by the researchers, which allowed individual donations to be tracked back to specific recipients and their treatment conditions. Donations made through Just Giving can be made anonymously, but the donor's identity is revealed to the fundraiser. In particular, we record three main outcome measures;

1. Whether a participant donated or not.
2. The amount of money donated.
3. Click-through rates (CTR) for links to the Just Giving sites.

These measures allow us to discern both softer and harder measures of message effectiveness in relation to matching funds in charitable giving. CTR identify whether certain types of matching sound immediately more appealing than others, while the actual donations tell us the extent to which matching structures influence whether people donate at all, and how much they donate.

Sample description

A total of 3,537 participants were randomised into the four groups. Three of the fundraisers had >50% failure of email messages, and thus sent messages to the groups via Facebook group messaging. See table two and three below for descriptive statistics of our sample.

Fundraiser	N	%	Method
1	636	17.98	Facebook
2	354	10.01	Email
3	239	6.76	Facebook
4	933	26.38	Email
5	553	15.63	Email
6	316	8.93	Email
7	506	14.31	Facebook
Total	3537	100	

Table 3: Number of participants per condition		
Group	N	%
Control	882	24.94
Standard match	885	25.02
Competitive match	883	24.96
Increasing match	887	25.08

Results

We begin by describing our analysis strategy. For all three outcomes measures (propensity to donate, amount donated, propensity to click through), we estimate a linear regression model specified:

$$Y_{ic} = \alpha + \beta_1 T_i + \beta_2 F_c + u_i$$

Where,

Y is the outcome measure. This includes three variations of outcome: (1) binary variable which indicates whether an individual donated to either charity, set to one if they did or zero otherwise; (2) binary variable, set to one if an individual clicked the link to either charity's fundraising page, or zero otherwise; and (3) continual variable indicating the amount of money an individual donated to either charity. α is a constant term. It can be interpreted as the response level of participants in the control condition. T_i is a vector of binary treatment indicators set to one if the individual received a treatment variant of email, or zero otherwise. The base category (control group) is omitted from analysis (hence, it is absorbed into the constant).

F is a set of fundraiser fixed effects, and u_i is an i.i.d. error term. The results of estimating our treatment effects on our four main outcomes can be found in table 4.

Table 4: Results of Experiment 1				
	(1)	(2)	(3)	(4)
	Donate	Amount	Amount	CTR
Linear Match	-0.002 (0.005)	-0.069 (0.106)	-4.810 (6.033)	-0.015 (0.012)
Increasing	0.001 (0.005)	-0.018 (0.111)	-4.226 (6.224)	-0.016 (0.012)
Competitive	-0.008 (0.004)	-0.137 (0.094)	1.397 (4.524)	-0.031** (0.011)
Control	0.012* (0.005)	0.204 (0.140)	18.581 (9.591)	0.078*** (0.012)
<i>N</i>	3537	3537	36	3537

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results show no impact of treatment condition on whether people donate or how much they donate ($P > 0.05$). Significant differences were found in the CTRs, with more people in the control condition clicking through to the donation page.

However, we note that the motivation of participants in these experiments may be atypical of donors in general, thanks to the highly social component of giving in this environment, noted by Smith et al (2014). As such, further studies will be required to further investigate these findings.

Methodology: Experiment 2

To further investigate the effects of non-standard matches we conduct a second experiment. This experiment makes use of the donor email list of a single charity,

“inner flame” (details of the charity are available in the appendix). Participant email addresses were randomly assigned to one of four conditions, in which they were asked to donate to the charity (which they had supported in the past), specifically supporting a fundraising effort by a senior member of the charity.

Inner Flame sent emails to everyone on their mailing list of prior supporters of the charity. The email messages asked recipients to donate money to the charity, and described the fundraising activity that David Wreathall, an employee of the charity, was running. Individual participants were assigned at random to receive different email treatments.

The main structure of emails was the same across conditions; however for the treatment conditions, recipients were told that donations would be matched. The type of donation matching was varied between treatment arms. Those allocated to the ‘standard match’ condition were told that donations would be matched £1 for £1. The ‘individual increasing match’ group were told that the amount of match they received would depend on the size of their donation - £0.50 for every £1 up to £15, £1 for every £1 up to £30, and £1.50 thereafter. The second increasing match treatment set the thresholds higher, at £50 and £150.

Participants were given four days to make a donation in order to be eligible for the match. There were three treatment conditions in addition the control condition, which are described in table 5.

Table 5: Treatment condition descriptions		
Arm	Intervention	Description
1	No match	Donations will not be matched.
2	Standard match	Donation will be matched £1-£1 up to £1000.
3	Individual Increasing Match 1	For every donation between £0-£14.99 they will match £0.50 for £1 donated, for every donation between £15-£29.99 they will match £1 for £1 donated and for every donation £30+ they will match £1.50 for £1 donated.
4	Individual Increasing Match 2	For every donation given they will match it at an escalating percentage rate (e.g a £50 donation will be matched £0.50 for £1 donated, an £80 donation will be matched £0.80 to £1 donated etc.) up to a maximum matching rate of £1.50 for £1 donated for donations of £150 and

The core text for the message was as follows (in bold):

Dear XXX

I am writing to ask whether you will sponsor me, as I take part in the “London-Cardiff 24Hour Team Relay Challenge”.

We are planning to relaunch Inner Flame’s “Firework” programme for young jobseekers as soon as we can, and want to raise £2,000 towards the costs. We have a potential funding source from this Summer, but our goal is to start the course at the end of April. If you can pledge your sponsorship in the next 72 hours, that will allow us to commit to that.

I am very aware of how many sponsorship requests we all receive (which is why I've only asked our supporters for sponsorship twice before in our 6 year history). However, this is another big year for us, so I've taken on a big challenge in the hope that it will inspire you to sponsor me. Our team will be aiming to run, in relay, the 160 miles between Twickenham and Cardiff in less than 24 hours. That's faster than my normal running pace, despite running (and navigating) in the dark and getting no sleep... I expect to do between 16 and 24 miles personally, with breaks in the middle (which actually make it harder, due to the acid build up in leg muscles!).

Please sponsor me, for any amount, by clicking here: <http://bit.ly/19Zmviq>

Thank you

David

Ps. Details on the "London-Cardiff 24 Hour Team Relay Challenge" can be found here: <http://www.wolfpackrunning.com/#!london-cardiff-24/c187v>

After participants were contacted, their activities were recorded. Specifically, we observe:

- i. Whether a participant donated or not
- ii. The amount of money donated (if any)
- iii. Click through rates (CTR) for links to the donation site.

These measures allow us to discern both softer and harder measures of message effectiveness in relation to matching funds in charitable giving. CTR identify whether certain types of matching sound immediately more appealing than others, while the actual donations tell us the extent to which matching structures influence whether people donate at all, and how much they donate.

Sample description

A total of 1100 participants were randomised into the four groups. Individual level covariates for the participants are not available.

Table 6: Number of participants treatment condition		
Group	N	%
Control	265	24.0
Linear Match	272	24.7
Increasing Match 1	282	25.6
Increasing Match 2	281	25.5
Total	1100	100

Results

As before, our main outcome of interest is whether or not the participants make a greater donation when they are offered one of the match conditions offered in this experiment. We therefore estimate a model such that:

$$Y_i = \alpha + \beta_1 T_i + u_i$$

Where Y is the outcome measure. This includes three variations of outcome: (1) binary variable on whether an individual donated to either charity, set to one if they did or zero otherwise; (2) binary variable, set to one if an individual clicked the link to either charity's fundraising page, or zero otherwise; and (3) continuous variable indicating the amount of money an individual donated to either charity.

α is a constant term. It can be interpreted as the response level of participants in the control condition. T_i is a vector of binary treatment indicators set to one if the individual received a treatment variant of email, or zero otherwise. The base category (control group) is omitted from analysis (hence, it is absorbed into the constant), and u_i is an i.i.d. error term. The results of estimating our treatment effects on our three main outcomes can be found in table 7.

Table 7: Results of experiment 2

	(1)	(2)	(3)
	Donate	Amount Donated	Amount Donating
Linear	-0.013 (0.013)	0.671 (0.775)	53.00 (26.645)
Increasing 1	-0.014 (0.013)	-0.268 (0.770)	4.00 (26.645)
Increasing 2	-0.005 (0.006)	-0.179 (0.382)	-2.08 (12.588)
Constant	0.032 ^{***} (0.009)	0.801 (0.540)	25.00 (15.923)
<i>N</i>	1100	1100	25

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results show no impact of treatment condition on whether people donate or how much they donate ($P > 0.05$).

Further Analysis:

Following the results of these two experiments, we report the results of our analysis on a pooled sample of our data. In this case, we treat linear matches as identical (as they are), and pool increasing match from experiment 1 and increasing 1 from experiment 2, dropping the higher value increasing match and the competitive match.

Table 8: Pooled Results for Experiments 1 and 2

	(1)	(2)	(3)
	Donate	Amount	Amount Donate
Linear	-0.006 (0.005)	0.081 (0.208)	16.868 (11.546)
Increasing	-0.003 (0.005)	-0.095 (0.208)	-1.699 (10.864)
Constant	0.018 ^{***} (0.003)	0.384 ^{**} (0.138)	21.346 ^{**} (6.831)
<i>N</i>	3750	3750	57

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusions

We have conducted two field experiments on non-standard matches in charitable giving with combined samples of around 5000. In these, we attempt to test in the field many of the non-standard matches as described in Sanders, Smith and Norton (2013), and find no significant effects of either linear, increasing, or competitive match on donation behaviour. Given that matching has been shown elsewhere to be effective, these findings are not sufficient to justify abandoning the hope that these interventions might ultimately succeed, but the results are not promising.

Given the lack of success of *any* of the matching interventions described in this paper compared with their relative effectiveness when tested elsewhere, our main conclusion must be that matches are not universally effective and hence that context, match size, and delivery play a role in whether matches will be effective. In our experiments, the context of online fundraising through sporting events, might have discouraged people from thinking in terms of the match.

This is important for practitioners not simply because it calls into question the usefulness of novel matching interventions, but because at the margin it should influence charity's decisions about what to do with seed money. In our experiments, we have spent £1086 in matches, and in so doing cannot be confident that we have elicited *any* additional donations. A charity facing a similar situation should consider what *e/se* match funding can be spent on.

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Appendix

Malaria No More UK

Malaria No More UK was launched in 2009 with the aim to end death from malaria, a disease that affects almost half the world's population, despite being treatable and preventable at a low cost. Strategic investments to partners in African countries are used to increase education, prevention, diagnosis and treatment of malaria. Since 2009, the charity has helped 11.6 million pregnant women access effective malaria prevention; protect over 50 million people with mosquito nets and insecticide spraying of homes; provide over 14.4 million reliable diagnostic tests and 19.4 million lifesaving treatments; and strengthen health delivery systems and evidence-based programming. The charity has a high return on investment, not only does it decrease morbidity, it also increases school and work attendance rates and leads to more productive communities and stronger economies. Malaria No More UK is registered under charity number 1126222.

The Schistosomiasis Control Initiative (SCI)

SCI's remit is to assist Ministries of Health across sub-Saharan Africa to control and eliminate the poverty sustaining and life threatening effects of schistosomiasis and intestinal worms. Schistosomiasis is a parasitic disease carried by freshwater snails, which kills an estimated 280,000 people annually and infects 240 million people around the world, with 90 percent of the burden occurring in Africa. The SCI helps governments with logistical support: mapping the prevalence of the disease, formulation of a strategy plan, requesting and obtaining praziquantel from the donation programme managed by the [World Health Organization](#) (WHO), and training of staff for implementation, monitoring and evaluation of the programme. They combine implementation and world class research to ensure that the treatment programmes achieve maximum success. In 2014, GiveWell listed SCI as one of the four top charities. Donations are processed by 'Imperial College London' (HMRC ref. X2361) and 'Imperial College Trust' (Charity No. 273071) on behalf of SCI.

Inner Flame

Inner Flame is aimed at people aged 16-18 in Swindon and North Wilshire, United Kingdom. Their main focus is personal development and helping young people to develop their potential. They offer training, coaching and challenging experiences which helps the participants build skills and self-confidence, learn to make positive choices for their future and take action towards personal goals. One example of their work is the Prince's Trust Team Programme, which helps young people move towards employment.