A roadmap to the economic evaluation of the activities of the Newhaven Community Development Association

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Pro Bono Economics is delighted to introduce this report, the results of analysis undertaken by Michael Barrow, Julie Litchfield and Andrew Newell from the Department of Economics at the University of Sussex.

Pro Bono Economics was founded in 2009 with the aim of bringing the skills of economists into the third sector, working pro bono. Many charities could benefit from the expertise of economists, particularly in helping to understand measurement, impact and value. We think that by bringing together economists and charities we can not only benefit individual charities, but also publish analysis that can help the sector more broadly.

The economists would like to thank a number of people for their help on this project: first of all, the team at NCDA who spent time explaining their work; in particular Andy Cheng, who acted as the main link with the team; and Olga Jbelli, a graduate student at the University of Sussex who did an excellent job collecting data from NCDA for which the team is grateful.

Executive summary

NCDA provides a range of services to the local community with the general aim of supporting regeneration in the Newhaven area. We were asked to provide an economic evaluation of NCDA's services and we chose to focus on a subset of those activities where the better quality data are available. These are the nursery, the family learning programme and the youth service.

These three accounted for 20% of the costs of all services provided by NCDA (another 31% goes to the government-sponsored Work Programme). The paucity of good quality data meant that it proved difficult to obtain solid evidence on the benefits of the services provided (e.g. youths abstaining from drug abuse). We therefore had to look at research evidence from similar activities elsewhere, such as pre-school programmes in the USA or the Families and Schools Together (FAST) programme, which runs in several countries.

These programmes are likely to provide benefit-cost ratios (BCRs) and rates of return which suggest such activities are worthwhile investments. Investment in pre-school typically has BCRs of around 2; the FAST programme has a ratio of around 3. For the youth service, evidence from research gives a wide range of results, from a BCR of 1.2 all the way up to 13. In the literature we surveyed, small projects seem to have higher rates of return: there are diminishing returns to such activities.

Using these research findings we have estimated the potential economic benefits of the NCDA activities, assuming that both the delivery of the interventions by NCDA and the characteristics of their client groups are identical to these programmes. If this holds true, the annual cost of the nursery of £240,000 could yield benefits in the order of £635,000, while the benefit-cost ratio of the youth service could be positive or negative depending on which existing programme is used as the basis of the estimation.

There are many shortcomings with this approach. While similar programmes appear to have substantial benefits relative to theirs costs, Newhaven's programmes need to be evaluated in their own right to be certain that they are realising the same benefits. We suggest some simple measures, which NCDA might like to take to improve the quality of the data they have and the use of it for analysis of their work.

A roadmap to the economic evaluation of the activities of the Newhaven Community Development Association

Introduction/Aim of project

In May 2012 the Newhaven Community Development Association (NCDA) approached Pro Bono Economics with a request for an economic evaluation of the impact created by their activities in the local area. Three of us (Pro Bono economists at Sussex University) agreed to undertake the project.

The terms of reference of the project were defined as follows:

> NCDA is seeking assistance from PBE to develop capacity in the economic evaluation of the impact of NCDA services. Expertise is sought to provide advice, guidance and mentoring to enable NCDA to develop and embed methods by which the organisation can sustain ongoing economic evaluation into the future.
>
> The proposal at this time is to focus this development on the Community Development and Learning section of NCDA (which includes the children's centre; a youth service; a variety of family learning courses, community gardening, use of green spaces and healthy living advice services) or a sub set thereof, from which NCDA can hone skills for effective economic evaluation to be used throughout NCDA.

Since that time we have been working with colleagues at NCDA to refine those terms of reference, to learn about NCDA's activities, collect data, consult relevant literature and finally to produce an analysis of a subset of NCDA's activities and draw up this report.

Development of the aims

Before visiting NCDA, we thought that we would perform a fairly conventional impact evaluation, with the hope that we would be able to establish some counterfactual case or some kind of quasi-experimental study with some form of control group. However, as we got to know about NCDA and its activities it became apparent that this was too ambitious; NCDA is a small scale organisation, its outputs (and even more so, the associated outcomes) are difficult to measure and records are not easily amenable to analysis. For example, a local youth might come along to a drop-in session run by the youth service. However, his 'journey' through the service might be very different, depending upon his needs, or he might drop out at any point. Hence it is extremely difficult to identify the 'unit of output' in many cases. Furthermore, establishing the counterfactual, what would happen if NCDA did not exist at all or if it did not run the services and activities we were evaluating, proved even more challenging than we had predicted.

However this does not mean that the activities are not valuable. The turning around of one or two lives of vulnerable youths, for example, could reap enormous financial and personal benefits. Being a small organisation, the difference between (say) two such successes and one in a given year could make all the difference to whether the activities are measured as valuable or not. In more technical

language, there is a likely high variance to the annual outputs and outcomes of NCDA's work, which renders it impossible highly resource intensive to make secure estimates of typical values. On top of this, many of the NCDA's interventions are aimed at making long-term differences to individuals and communities. Such long-term differences, that accrue over many years, are clearly beyond our scope.

These are very familiar, and formidable, problems with impact assessment and valuation of social interventions. In the experimental ideal, a random sample of subjects are either treated or not treated. Then the outcome of the treated is compared to that for the non-treated. There are typically a number of issues that make this comparison difficult when applied to social interventions. One issue is *selection*, that is, non-randomness in the selection of subjects, and how this is dealt with to make a useful comparison. Secondly, as in the examples later in the report, the 'treated' do not receive identical treatments. Thirdly, the outcomes of the treatment are costly to capture, for example, there could be a wide range of potential benefits, or the benefits could accrue over a period of many years. Either way, this creates a challenge to evaluation.

These issues all apply to the NCDA case. We have, for example, little solid information about the process of how NCDA participants, such as young people, or families with pre-school children, find their way to NCDA, and how they differ from people who do not use NCDA. Also, the extent to which participants use NCDA's services provided varies substantially but the available data, though very useful, do not fully capture this. Lastly, outcomes such as avoiding unwanted or teenage pregnancy, keeping out of trouble with the police or raising education aspirations are costly to observe or measure and their impacts over a person's life difficult to measure. As the reader will find in our case studies, the problems do not stop here. Even where an impact is identified, there are formidable uncertainties in putting a financial value on it, and discounting that to the present in order to compare to expenditures. One important message of this report is that there is not a simple and inexpensive evaluation toolkit for the activities of organisations like NCDA.

We focus on a subset of NCDA's services where there was at least some degree of quantitative measurement and assessment of the value of outputs, and for which some long-term studies of related services exist for us to draw upon. Having consulted extensively with key workers within NCDA, we have tried to make our work comprehensible to non-specialists, so that these NCDA workers could feel some degree of 'ownership' of the findings. The ideal outcome would be that the findings could be used within the organisation to enthuse it with a sense of purpose, to give the organisation at least some idea of what it was contributing to the locality.

We also developed the aim of embedding this process within the organisation, hoping that it could continue the work we had started, for example by repeating the analysis each year and hence getting a sense of progress. For this purpose we developed a simple spreadsheet to summarise our results, which could be updated simply by entering (e.g.) the number of clients to the youth service each year.

We also explored the possibility of a long-term collaboration between ourselves and NCDA, involving students from the university. There is an annual youth survey carried out in Newhaven under the auspices of NCDA. The questionnaire is sent out to schools and other organisations and the responses are collated and summarised. However, this is a time-consuming task for NCDA employees to do and is something which could well be done by students under the guidance of

NCDA and ourselves. This would have the benefits of (a) reducing the workload on NCDA and (b) give our students an opportunity to engage in some real research and learn about working with a partner organisation. Even if our assessment of NCDA (undertaken at a particular point in time) is not, and cannot be, comprehensive we feel that there will be a benefit of bringing our two organisations together to mutual benefit. Exploration of this collaboration is on-going.

The development of the project and its aims was agreed over a series of meetings between the university team and representatives of NCDA.

Description of NCDA activities and choice of services to study

The NCDA is a charity "dedicated to facilitating and supporting the regeneration of Newhaven and surrounding areas through integrated voluntary sector action". The Association offers services under three broad headings:

- Community development
- Employability and inclusion
- Well-being

The first of these covers activities such as a nursery, a children's centre, a youth service, a community centre and a range of family learning activities. 'Employment and inclusion' includes services to help people into work, support for ethnic minorities such as translation services and advice on matters such as housing, benefits and debt. Under the heading of well-being there is a variety of courses on the arts, healthy living, exercise, as well as mental health support programmes. The range of services is wide, from helping to incubate local social enterprises to gardening clubs. From this description it is apparent how difficult it is to come up with an overall evaluation of the totality of services offered by NCDA.

We therefore decided to focus on a small number of services which (a) had some quantitative and qualitative information to use and (b) were running during the period of our research. This led us choose three activities:

- The nursery
- The youth service
- The family learning activities

Even if this only covers a limited subset of NCDA's activities it gives us an opportunity to demonstrate how the organisation might extend our methods to think about the value of all of its services, even though outputs are hard to measure.

The scale and scope of NCDA's activities can also be gauged by examination of their accounts, shown in simplified terms below.

Table 1: income and expenditure (2011-12)

	Total
Income	£
Voluntary incoming resources - donations and legacies	18,613
Activities for generating funds	6,987
Investment income - interest received	832
Incoming resources from charitable activities	1,877,285
Total incoming resources	1,903,717
Expenditure	
Development of Newhaven and surrounding areas	1,876,454
Governance costs	13,893
Total resources expended	1,890,347
Net income/(expenditure) for the year/Net movement in funds	13,370
Fund balances at 1 April 2011	793,373
Fund balances at 31 March 2012	806,743

Source: NCDA Annual Report and Accounts 2011-12

The table shows that total expenditure and income of the charity were of the order of £2m per annum. Table 2 shows expenditure broken down by category, with the three services that we focused upon highlighted. It can be seen that these three services make up about 20% of the total expenditure of the organisation, though a much larger proportion if one ignores the large expenditure on the employment which, amongst other things, delivers part of the government's *Work Programme*. The largest amount of expenditure goes on staff costs, with approximately 60 people in total being employed in some way by the Association.

Table 2: Costs of different services provided

DIRECT COSTS	Well-being	**Youth work**	Advice hub	**Nursery**	Community centre	Employ-ment	**Family learning**	Healthy lifestyles	New projects	Transition fund	Cafe	Gover-nance	Total
Staff costs total	239,720	49,909	61,237	205,258	40,780	344,646	35,193	45,297	0	25,613	68,557	3,889	1,120,099
Beneficiary costs eg training	3,677	15,769	477	12,425	1,157	47,032	4,145	14,282	0	3,226	31,231	0	133,421
Grants, gifts and donations	0	0	0	-34	0	0	0	100	0	0	0	0	66
Rent and room hire	3,468	2,641	2,278	2,562	2,814	27,927	34	5,290	0	3,743	0	0	50,758
Loan Interest	0	0	0	1,299	1,299	0	0	0	0	0	0	0	2,598
Light, heat and cleaning	58	0	590	9,410	7,546	4,067	0	10	0	1,650	0	0	23,330
Telephone, postage, etc	11,152	633	3,193	3,106	5,795	16,905	437	4,091	0	1,661	970	0	47,943
Repairs and Maintenance	4,935	681	3,831	4,417	11,122	18,224	335	643	0	44,477	457	0	89,122
Publicity	200	0	0	230	0	80	0	13	0	7,012	1,072	0	8,607
Depreciation	0	540	0	0	9,673	0	0	0	0	0	0	0	10,213
Licences and Permits	0	0	0	0	689	375	0	0	0	0	0	0	1,064
Other costs	0	0	0	26	0	1,204	0	0	0	0	0	0	1,230
Consultancy legal and professional	5,169	1,113	3,575	4,491	146	59,836	16,729	4,484	42,486	38,310	2,000	0	178,338
Internal Costs	-44,270	22,371	2,198	-15,351	-52,890	34,540	-3,179	11,222	0	162,225	0	0	116,867
TOTAL Direct Costs	224,108	93,657	77,379	227,840	28,132	554,836	53,693	85,430	42,486	287,916	104,288	3,889	1,783,656
INDIRECT COSTS													
Admin, etc Staff	10,234	4,277	3,534	10,404	1,285	25,337	2,452	3,901	1,940	13,148	4,762	0	81,274
Insurance	1,654	801	845	1,256	155	6,279	296	471	234	1,587	575	470	14,625
Consultancy legal and professional	0	0	0	0	0	0	0	0	0	0	0	0	0
Accounting and Audit	0	0	0	0	0	0	0	0	0	0	0	9,474	9,474
Bank Charges and interest	158	66	55	161	20	392	38	60	30	203	74	60	1,318
TOTAL Indirect Costs	12,047	5,144	4,434	11,822	1,460	32,008	2,786	4,433	2,204	14,939	5,411	10,004	106,691
TOTAL OF ALL COSTS	**236,155**	**98,802**	**81,813**	**239,661**	**29,592**	**586,845**	**56,479**	**89,863**	**44,690**	**302,855**	**109,699**	**13,893**	**1,890,347**
% of total costs		5%		13%			3%						

Brief descriptions of the services evaluated

Nursery

The nursery has a capacity for nine babies, 16 2-3 year olds and 24 3-5 year old children. Approximately 60% of children have some kind of language or behaviour issues. Family issues which come to light can be referred on to other services offered by NCDA so there are synergies between some of the services offered.

Family Learning

This consists of a range of courses, such as 'Keeping up with your children's maths', aimed at parents who want to keep up with what their children are learning in school, or a children's club run over the summer months of the school holidays. A typical course might consist of two hours per week over a six week period. Approximately 15 courses are run each year (partly depending upon demand) with about 10 people on each.

Youth Service

This service has approximately 400 young people on its register at any one time. They can vary widely in age and in their needs, which for some can be described as 'chaotic lives'. The youth service runs a combination of one-to-one sessions with clients and workshops with larger groups, as well as a local youth forum. A typical workshop might be a visit and talk by the local police.

Newhaven

To give some context of where the NCDA operates, Newhaven is a town of 12,232 citizens[1] and is relatively poor by the standards of the south east of England. It ranks 8,502 out of 32,482 super output areas in terms of the Index of Multiple Deprivation 2010 and 21.1% of its children live in poverty[2]. It is therefore on the border of the first quartile of areas in England in terms of deprivation, and this is particularly true of the education, skills and training measure, where it ranks 2,457. There is clearly much for NCDA and others to do to address these disadvantages.

Data availability

Our main problem in carrying out this assessment is the quantity and quality of data that we could extract. With such a small organisation, there is not the scope for data collection and particularly analysis. Data are collected for the purpose of helping to carry out the tasks of the organisation rather than for looking back and evaluating what has been done. There are some valiant attempts to monitor progress in some areas (e.g. to record the 'destination' of those on a course) but these are neither systematic nor complete.

[1] 2011 Census
[2] East Sussex in Figures, 2010.

For example, the family learning service has an enrolment form for everyone who joins a course. This does record useful information such as ethnicity, educational qualifications, disability, etc but many of the fields are left blank, where participants have chosen not to reveal their qualifications, for example. A folder of information is kept for each course, including an attendance register and tracking sheet. The latter contains space for a 'destination', which might prove useful as an output of the course. It is useful if the course aims to help people into work, where success could be a simple 0-1 indicator, but it is less useful for the cookery course, whose output or value added is more ephemeral (though possibly no less important). There are evaluation forms for each course, filled in by the participants at the end of the course, which in some sense measure the success of the course (or at least the participants' happiness) but this is not necessarily the same as value added. The focus is on the course rather than on the outcome for participants.

The nursery also keeps data of each child's progress on a variety of tasks, held within a folder for each child. This helps the nursery staff keep up with each child's development and plan their future activities but it does not provide an overview of progress of the children as a whole and hence of the value added by the nursery service. This would require routine collation of the information to be carried out, taking time away from the primary role of the staff, that of taking care of the children. Any collation would not be entirely straightforward, as the individual files only show a tick mark when a child has achieved something but does not indicate how much progress there has been since the baseline, etc.

Although this is a disappointing state of affairs, it probably reflects the situation in many such small organisations, particularly in the charitable or voluntary sectors, where outputs are hard to define as well as measure and there are very limited resources available for systematically collecting information. As far as this project goes, the only reliable and consistent data we can get are numbers participating in the various activities. We have some further information regarding gender, benefit entitlement, etc but this is not systematic or complete, so we can only proceed on the basis of estimates such as *x*% of those undertaking an activity were claiming benefit.

Data collection was carried out at NCDA by a graduate student from the university, Olga Jbelli, who visited on three occasions to go through files and extract relevant numbers. The data were collected on an anonymised basis, with the approval of NCDA and in line with the Sussex University's ethical guidelines for this type of work.

Methods/Cost benefit analysis/Evaluation

The ideal methodology for carrying out such a study is to look at the outputs, outcomes and impact of a policy or of an organisation, compare this to some counterfactual scenario and set these against the costs. Rarely is such an ideal achieved, especially when the data are limited and the study is relatively small scale. Measurement becomes more difficult as one moves from outputs to outcomes and then onto the longer term impact.

In our case, as already explained, we have some crude measures of output for a subset of the organisation's activities. As we have outlined, outcomes are difficult to measure because it is difficult and costly to follow many of the people who have participated in NCDA's activities. Children from the nursery go on to school but there is no readily available evidence of how they perform at school. In such cases a cost-effectiveness study might be undertaken, simply comparing costs across organisations of achieving

outputs, without looking beyond this to outcomes and impacts. But this is beyond the scope of this study.

We opt to use evidence from elsewhere, where more systematic studies have been done, to make some speculative estimates on the value of outputs such as those of NCDA's services and to assume that NCDA is similar to the average organisation studied. For this purpose we have drawn extensively on the work of the Social Research Unit, based in Devon, in particular its work on *Investing in Children*[3]. This provides a summary of evidence on projects similar to the types of activity of NCDA and gives figures for average cost, benefit-cost ratio and rate of return. Their work draws upon that of the Washington State Institute for Public Policy[4], which is a leader in the field of impact evaluation and evidence-based policy. We have also made use of other relevant studies which are referenced below in the separate sub-sections.

It is important to note that the estimates we draw from the evidence of these other studies are only illustrative for our purposes. The interventions those studies investigate, of reasonably well matched activities, have many differences of implementation to NCDA's own activities. This means that what we calculate for NCDA only illustrative of the methods and requirements of a more rigorous study. An example of such differences would be the higher turnover of children in NCDA's nursery relative to the comparison study.

WSIPP itself recognises that its evaluations have shortcomings even for the projects they studied:

> "Many programs we review have achieved other outcomes than those we include in our benefit cost analysis. Some prevention programs, for example, have been able to improve outcomes such as "parent-child relationship" or "classroom conduct disorder." These may be worthy outcomes but, at present, we are unable to monetize their benefits using our current methods discussed in Appendix D. If these programs did not also include outcomes that we could monetize, then they were not included in this analysis. Future research may enable us to monetize and include some of these other outcomes"[5]

Case 1: The Nursery

Nursery education affords a potentially wide range of benefits. There are short-term benefits from improved wellbeing of child and parents/carers, which could be measured during attendance, or soon after, with standard survey designs, but important potential benefits are likely to accrue years later in the form of improvements in the child's ability to absorb the benefits of primary, secondary and tertiary education, and indeed, beyond that into adult life.

One very good study of these long term benefits is Heckman et. al. (2010)[6]. This study is a re-evaluation of the High/Scope Perry Preschool Program, which took the form of 'an intervention in the lives of

[3] Social Research Unit, *Investing in Children: Early Years and Education*, October 2012 and the related *Technical Report*, November 2012

[4] Particularly the *Benefits and Costs of Prevention and Early Intervention Programs for Youth*, available at http://www.wsipp.wa.gov/pub.asp?docid=04-07-3901.

[5] WSIPP (2004) *Benefits and Costs of Prevention and Early Intervention Programs for Youth, Technical Appendix*, p2.

[6] James J. Heckman, Seong Hyeok Moon, Rodrigo Pinto, Peter A Savelyev and Adam Yavitz, 'The rate of return to the High/Scope Perry Preschool Program', *NBER Working Paper* 15471, November 2009, published as Heckman, James J. & Moon, Seong Hyeok & Pinto, Rodrigo & Savelyev, Peter A. & Yavitz, Adam, 2010. "The rate of return to the HighScope Perry Preschool Program," *Journal of Public Economics*, Elsevier, vol. 94(1-2),

disadvantaged children' at Perry Elementary School in Ypsilanti, Michigan in the early 1960s. (Heckman et. al. , page 2) This programme gave preschool education of two and a half hours a day in the school year to a group of about 60 children, starting at their 3rd birthday and lasting two years. These children, and a control group, also of about 60 children, not given the preschool education, were followed up to the age of forty. This small experiment is the main evidence base for evaluating the economic impact of preschool education on disadvantaged children. Though not identical , the Program was broadly similar to the NCDA Nursery. For example, in both cases 3- and 4-year-olds were the main target group. We surmise from our discussion and observation of the NCDA nursery and the discussion in Heckman et. al, the basic composition of the nursery day was not very different between the Program and NCDA. However, a designed experiment is very different in implementation to a user-focused resource provision, such as the NCDA Nursery, where issues such and the desirability of similarity of treatment across clients, would not be addressed automatically. In an experiment, clients (the parent/carer) buys into a sustained intervention over a fixed period, while in a real situation, such as the NCDA nursery, the clients behaviour, and thus the child's experience, is dictated by the demands of everyday life.

The High/Scope Perry evaluation rests upon differences between the 'treated' and the 'control' children, in aspects of their later life. Some of these differences are easy to see, though. Looking at the histories of the two groups, it is clear, especially among males, that the children in the Program, the 'treated', tended to fare much better in later life than the group of children chosen as comparators , the 'control' group. Table 3 illustrates this. Note the two groups have quite similar backgrounds in terms of mother's age and parents education, on average. But more of the treated graduated from high school, rather than dropping out. Similarly, more of the treated were in work at age 27 and again at age 40. Of those in work, earnings were higher on average among the treated, both at age 27 and age 40. Not surprisingly given the income results and employment results, a smaller fraction of the treated group ever relied on welfare. Lastly the treated groups experienced fewer arrests. All this begs the question of whether these better life outcomes for the 'treated' can reliably be said to be due to the High/Scope Perry Program.

Table 3 Treatment and control groups in the High/Scope Perry Program

	At Age	Control	Treatment
Sample size		69	58
Mother's age	Birth	26	27
Parent's High School grade-level	3	9.5	9.5
Stanford–Binet IQ	3	79.7	79.5
High School graduation (%)	27	46%	64%
Currently employed (%)	27	56%	69%
Yearly earnings ($)	27	13,191	15,731
Currently employed (%)	40	64%	76%
Yearly earnings ($)	40	23,335	28,752
Ever on welfare (%)	18–27	48%	39%
Ever on welfare (%)	26–40	39%	33%
Arrests, all felonies	≤ 40	2.21	1.22

Notes: this is adapted from Heckman *et. al.* (2010), Table 2.

pages 114-128, February.

To examine whether these differences were due to the Program, Heckman and his co-authors adjust the data to ensure randomised selection into the Program, then they control as far as they can for other influences on these later life outcomes. The next stage is to estimate the benefits of the Program. The main concentration is on, as we've seen, wage and employment benefits, and crime reduction benefits. There are many tricky statistical problems to solve,[7] but with these solved, a comparison can be made between the benefits and the costs of the project. The calculations of Heckman et. al. give similar results in terms of benefit to cost ratios as the Early Childhood Education and High/Scope Perry (from an earlier study) quoted in *Investing in Children*, see Table 4.

Table 4 Estimated Benefit/cost ratios and Annualised rate of return for the High/Scope Perry Project.

	Benefit/Cost ratio	**Annualised rate of return to investment**
Heckman et. al., High/Scope Perry	2.20	7-10%
***Investing in Children,* High/Scope Perry**	1.84	6%
***Investing in Children,* Early Childhood Education**	1.92	6%

Sources: row 1: Heckman et. al. Table 1; rows 2 ad 3, *Investing in Children..*

In Table 4 two key sets of estimates are given. First we have the *benefit/cost ratio*, which is given by dividing the estimated monetised employment-enhancing and crime-reducing benefits of the Program divided by the cost. The second key number is the estimated *annualised rate of return to investment.* This is calculated once all costs and all current and future benefits have been estimated. It reflects the annual percentage return on an investment of identical cost that would be needed to match the current and future benefits.

With these results in hand we turn to NCDA's nursery and carefully make a similar set of calculations. Our calculations are going to be estimates of the impact on people's lives of NCDA nursery compared, implicitly, with those who do not experience any preschool. First we need to think about how long NCDA children stay in the nursery on average.

NCDA kindly allowed us to study the anonymous records of a group of 16 recent nursery attendees, all of whom left to start school at 4+ years of age. The range of time periods children spent at the nursery was large, from 2 to 41 months, with an average of 20 months. Thus, some had been with the nursery since they were babies, but others attended for only a few months. But this group does not fully reflect the typical experience, as it does not include any children leaving the Nursery for reasons other than completion of pre-school. This short-attending group of leavers reflects the fact, confirmed by the Nursery management, that there is, quite naturally, more turnover in the nursery than in the High/Scope Perry Project. How do we reflect the impact of this turnover on the long-run benefits? By making assumptions about the nursery spell durations of those who do not complete the nursery until they are ready for reception at primary school, we estimate that the average duration of a spell of attendance is about 12.9 months, and about 3 children per month start or leave the nursery.

The next question raised by the variety of attendance spell lengths is how the long-term benefits accrue over a spell. We know of no studies of this. There are a number of assumptions one could make:

[7] For instance, one tough problem is in putting values on crime prevention. After that there remains the issue of how to compare £1 today with £1 in the future, i.e. the choice of a discount factor.

1. There is no benefit unless children attend for two years, or some other specified length of time – as we said there are no studies providing evidence on what this period should be, and assuming a minimum of two years is likely to understate the benefits significantly.

2. The benefits have a linear relationship with the spell length i.e. an extra month in the nursery leads to 1/24th of the life-time benefit (based on the lifetime benefit from 24 months in the High/Scope Perry programme). This means that the benefit to cost ratio will be the same irrespective of the time spent in the nursery.

3. The majority of the benefit is gained from the first few months in the nursery – this means that the benefit to cost ratio would be higher for less time spent in the nursery.

4. A longer period of time in the nursery leads to relatively more lifetime benefits, so spending less than two years, as is the case on average in the NCDA nursery, will not yield the full benefits achieved by the High/Scope Perry programme.

We have used the last assumption, and developed a simple mathematical model of this, which generates a benefit to cost ratio for a spell of 12.9 months of just about 1.5. Chart 1 in the appendix illustrates the model. If the direct nursery costs in the NCDA accounts are similarly calculated to those given in Heckman et. al. for the High/Scope Parry experiment then we might apply a multiplier of 1.5 to those to evaluate the long term benefits in NCDA's case.

We have chosen to adjust the lifetime benefits by the number of months that children participate in the programme. An alternative option would have been to adjust the lifetime benefits by the intensity and effectiveness of the programme. For example, the High/Scope Perry programme appears to be very structured and intense and therefore might be more likely to produce effects and benefits that stay with participants for longer than in the case of the NCDA nursery. This is as a result of the way in which the programme is implemented, not just as a result of the length of time that participants engage with the programme. However, available data did not allow us to model this.

But what about the practical short-run benefits for the parents? We don't know what parents/carers do with the time that is freed up by using nursery care. One key reason to use the nursery is to free up parents' time. The simple way to value this time is to use a local wage rate. The current fee for Nursery care is age dependent, but ranges from £3.90 to £4.30 an hour. A very quick sweep of job market websites suggests a semi-skilled hourly wage in Newhaven of something like £9 or £10 per hour. Of course there are likely job shortages, especially job shortages for people whose work patterns must fit around small children. If we assume that means that, on average, only half of the hours of Nursery care can be used for paid work, then the benefit/cost ratio for the short-run time benefit reduces from 2.3 (i.e. 10/4.3) to 1.15. But the monetised value of all activities should in principle be added. What might these be? Only in the case where the carer disliked leaving a child in the Nursery and got no benefit from the time freed up, but did so for the long-term benefits, could this value be negative. It seems to us this would be untypical.

Our very speculative benefit to cost ratio, for a working carer with a child in the Nursery is 1.5 +1.15 =2.65. Put differently, if future wage, employment and crime reduction benefits are taken into account as well as the freeing up of carer's time, the benefits of the nursery might be more than doubled. A benefit/cost ratio close to three is very high. It is obvious, we hope, that the margin of error here is large. The real question is how low the BCR might be. Recall those striking differences in wages and

employment between the nursery and non-nursery children in High/Scope, for instance 20% higher wages by the age of 27 for two years of programme. If those results stand and a year of NCDA nursery costs between £4,000 and £5,000 depending on the number of weeks of the year attended, then it would take very few years of work to repay the cost of Nursery. Although we cannot estimate a lowest possible benefit to cost ratio, recalling those estimated wage differences and ruling out the possibility that freed-up carers time is of no positive value makes it hard to credit a ratio below 2. But the work of putting some kind on lower bound on the benefits is beyond this study.

Case 2: Family Learning

For the Family Learning part of NCDA's activities, we based our assessment on evidence from the Families and Schools Together (FAST) programme[8], an after-school programme aimed at 6-13 year olds, aimed at encouraging positive parenting and building bonds within the family. The programme runs in many countries, including the UK, and has the advantage that various randomised control trials of its activities have been carried out giving evidence of its effects on such outcomes as family cohesion, parent involvement in education and on academic competence[9]. As the name suggests, the programme works with the children's school, particularly in the form of 'extended school' activities. Typical events include the group cooking together, parent-child one to one discussion, and making toys where the parent follows the child's lead. A typical course lasts eight weeks.

Without being explicitly modelled on FAST, the Family Learning programme at NCDA is manifestly similar in its goals. Its aims are stated as:

> "To provide activities, learning and individual support to enhance and improve children's learning (especially addressing communication and social skills) and support parents and carers especially enhancing parenting skills; supporting parent and carer life skills and improving life chances."[10]

It is more difficult to compare practical aspects of the activities in detail, such as the precise age ranges or numbers of children involved on any particular activity. FAST in fact covers a wide range of activities for children of all ages and the evidence of its benefits (that we use below) comes via the Social Research Unit in the UK. Its report[11] states that it bases its evidence on children aged 6-13 (as stated above), though it is not clear what precise activities this evidence relates to. Hence we only have a broad concordance of FAST and NCDA activities to support our use of the evidence.

There is a mix of individual and group activities such as play groups and individual action plans. We managed to undertake a short survey of one of the NCDA family learning activities taking place during our period of research, a week long course for parents/carers and children based around Egyptian artefacts. Note that this appears shorter than the typical FAST course so, to the extent that the benefits build over time with the length of the course, we might be over-estimating the true benefits of NCDA's interventions. Although some parents and children might be in contact with NCDA over a longer period

[8] See http://www.familiesandschools.org/.
[9] Middlesex University, *Aggregate FASTUK Evaluation Report of 15 Schools in 15 Local Education Authorities (LEAs) across the UK*. October 2010
[10] Taken from *About Family Learning*, NCDA, April 2012.
[11] See Social Research Unit: *Investing in Children: Early Years and Education*, October 2012 and also the related *Technical Report*.

than one week via taking multiple courses, this is not systematically designed into the programme, unlike FAST. We hoped to obtain some kind of estimate of the benefits parents got from the course in the form of a willingness to pay, but on reflection we felt it better not to ask such a direct question as it can easily set up expectations that charges for courses will be introduced or increased and this might interfere with the work of NCDA. Hence we asked more innocuous questions regarding how much the participants enjoyed the experience, what other activities they would have done if not for the course, and how much they think they would have spent if they had done the alternative activities. The latter figure arguably provides a lower bound on how much the participants would have been willing to pay for the course, since they preferred the course to the alternatives.

There were 13 families on the course, although we only got data from nine adults accompanied by 14 children. The average age of the children was approximately 7.5 years, the oldest being 12, the youngest three. Five of the survey respondents reported having attended a previous course with NCDA. All respondents said the course was fun or great fun, all found it useful or very useful[12] and all of them said they would do similar activities again in future. From the perspective of the participants the course may be considered a success.

In terms of the alternative activities, we asked them to tick three from a choice of eight, with the results shown below.

Table 5: Alternative activities

Use a child-minder	Visit friends or family	Visit a theme park	Go to the park	Go swimming	Go to the cinema	Stay at home	Other
0	6	3	6	3	4	9	3

The most popular alternatives were the cheapest ones, not surprisingly, and perhaps reflect the economic situations of participants. Finally we asked how much the participants would have expected to spend on those alternative activities. We offered a four point scale once again (<£5, £5-10, £10-20, >£20) for ease of understanding and estimation, although there is a risk that we might be 'framing' the answer by so doing. The average expenditure reported was £16.40 (based on nine respondents) and the total being £147. Adjusting for a couple of non-respondents suggests a total figure of around £180. As we stated before, this provides a floor for the estimate of benefits and does not include the direct benefit of the course activity, which is revealed to be preferred to those alternatives and hence more highly valued. Several of the alternative activities, such as visiting friends or family, involve little or no cost (which is not to say they are not valued) so perhaps using this alternative expenditure as a comparator is not so useful after all.

Hence a more representative figure of benefits may be found using evidence from the FAST programme. That evidence[13] suggests a typical unit cost of around £230 (based on a throughput of 160 children and 80 adults per annum), yielding benefits valued at £756 and resulting in a benefit-cost ratio of 3.27. Usefully, this evidence is based on British activities so there is less of a problem of transference of evidence to our own case. Of the benefits, two-thirds accrue to the participants themselves and one-third to taxpayers.

[12] These were responses on a four point scale from 'Not fun' or 'Not useful' up to 'Great fun' and 'Very useful'.
[13] See Social Research Unit, *op. cit*.

Because of the time profile of costs and benefits, the estimated rate of return on investment is 8%. This is summarised for convenience in the following table:

Table 6 Estimates of Cost and Benefits of FAST activities (per participant)[a]

Intervention	Cost £	Total Benefits £	Benefit-Cost Ratio	Rate of return
FAST	230	756	3.27	8%

a Social Research Unit, Investing in Children: Early Years and Education, October 2012 and the related Technical Report, November 2012

Unfortunately we do not have any evidence of the variation in returns so we cannot provide any type of confidence interval around this figure.

NCDA's Family Learning programme typically deals with about 150 participants per annum and, according to the accounts shown earlier, costs a total of £56,000. This gives a cost per participant of £373, so a similar scale of resources compared to the FAST programme. If we apply the benefit-cost ratio of 3.27 to this expenditure we obtain £1219 per participant and grossing this up to all 150 participants yields gross benefits of £183,000 or £127,000 net of costs. Of these net benefits, two thirds might be attributed to the participants themselves, or about £570 per participant.

It must be emphasised again that we are making the somewhat heroic assumption of transferring evidence from FAST activities to NCDA's, with all the dangers that implies. However we are not able with the present evidence to make a direct assessment of NCDA's Family Learning programme of activities – it would require a much more substantial amount of primary research – and so some form of existing, comparative evidence must be used. Even the descriptions of FAST activities that we could easily access did not give a clear and detailed account of what those activities are, and it appears that it actually consists of a wide variety of different activities that might (or might not) occur in different instances of that programme. It is important to read our report and conclusions with these caveats in mind.

Case 3: the Youth Service

This is the service that is the most difficult to assess. It is, in part, a 'safety net' service, the use of which is voluntary. In youth work small, single-meeting interventions might make big differences which are never observed by the provider. This is confirmed by the very wide range of benefits estimated in previous studies. Estimates are drawn from the series of studies conducted by the Social Research Unit (SRU)"Investing in Children", October and November 2012. In the context of Youth Services, two interventions used by the SRU report are identified as being most useful in comparison to the services offered by NCDA. Neither of course is identical to NCDA's work but they do at least capture the types of activities offered. The interventions we have chosen for comparison with NCDA have potential impacts across a wide range of outcomes, from reduction in crime and anti-social behaviour, dealing with abuse, and raising educational and work aspirations, and this chimes well with the aspirations of the NCDA Youth Services programme.

The first is an intervention called Life Skills Training. This is "a school-based curriculum that teaches children aged 11-14 social and self-management skills to reduce the risks to them of alcohol, tobacco, drug abuse and violence" (SRU Technical Report, 2012, page 6). Bear in mind that the NCDA service is clearly not a school based programme, and is not restricted to this particular age group, and this, among

other aspects might be very important. However the activities are similar and therefore offer some point of comparison.

The second is a programme called Quantum Opportunities. This is "a four year programme in which disadvantaged young people aged 14-18 work with a caring adult on basic skills, personal development, cultural enrichment and volunteering" (SRU Technical Report, 2012, page 6). Here the focus on disadvantaged young people is useful, although again the age range is not quite as wide as that of the young people using NCDA.

For each intervention, SRU provides estimates of the costs, including training costs, intervention delivery costs and supervision costs. They do not include the costs of starting up the intervention such as pilot programmes, office rent etc. The table below reports costs per participant over the duration of the programme. For the Life Skills Training intervention, the cost of £27 is per child over the course of the three year duration of the programme, reflecting the savings of delivering a large scale programme in school. Quantum Opportunities is a more costly intervention to implement, with an average cost per young person of £20,663 over 5 years. The WSIPP estimates on which this cost is based vary by up to 30% because of differences in costs across sites.

The benefits of each intervention are estimated based on valuations of expected reductions in crime and victimisation, improvements in labour market earnings, and reductions in child abuse and neglect outcomes. The expected benefits are based on estimates of how crime, labour market and child abuse outcomes improve in response to improvements in a range of behaviours, from school attendance, to anti-social behaviour and drug and alcohol use. Data on the numbers of young people who go through the Youth Justice System in England and Wales, and their unit costs, the probabilities of different types of sentences being passed down, earnings data by age and education, and the percentage of students leaving school with A levels, are used to estimate the monetary value of cost savings and benefits that might be attributed to the interventions.

The Life Skills training intervention is estimated to provide benefits totalling £352 per child, and hence a benefit-cost ratio of 13.04: for every pound spent on the programme an estimated £13 are saved. Quantum opportunities is estimated to yield benefits of £25,517 per child, but with its higher costs of delivery, the benefit-cost ratio is only 1.23.

Table 7 Estimates of Cost and Benefits of Youth Interventions (£ per participant)[b]

Intervention	Cost	Total Benefits	Benefit-Cost Ratio
Life Skills Training	27	352	13.04
Quantum Opportunities	20,663	25,517	1.23

b Social Research Unit, Investing in Children: Early Years and Education, October 2012 and the related Technical Report, November 2012

One important note of caution. The services offered by NCDA are not the same as those of any of the interventions studied by SRU and hence we cannot state with any certainty that the benefit-cost-ratios estimated by SRU are in any way related to those that might be achieved by NCDA.

Activities

Our inspection of records kept by the youth service reveal that 153 young people, 91 male and 62 female, aged between 11 and 19, used the service at least once during the period 1st October 2012 to 29th March 2013.

Of these, 96 were given advice on sexual health, 70 on education, with smaller numbers seeking advice on other issues. 45 young people attended workshops on healthy cooking, 30 attended workshops of sexual behaviour. A small number (33) were referred to other services, although data on outcomes of these referrals is patchy.

NCDA attendance records only cover the 6 month period between October and March and show that 153 young people used the Youth Service at least once during this period. In the absence of data over a longer period we make a very simple assumption that 306 children use the Youth Service at least once over the year.

Of the 153 registered young people, 83 attended twice or more in a 6 month period. Again, a simple assumption that use is constant across the year gives 166 repeated uses in the year.

Costs

The direct cost of running the Youth Service in 2011/12 was £93,657, or £98,802 if indirect costs are taken into account.

Calculating Youth Service benefits

Given the massive range (one ten times larger than the other) of estimated benefits between the Life Skill and Quantum Opportunities, it would be misleading to try to estimate benefits and benefit-cost ratios in this case. This example offers a clear illustration of the difficulties of estimating benefits for inherently diverse activities like the Youth Service, with few existing studies.

Conclusion and road map to economic evaluation for NCDA

Using other studies is useful to the extent that NCDA can demonstrate comparability with both the intervention evaluated, and the characteristics of the evaluation population.

This University of Sussex review shows that this varies considerably between different programmes. It is possible to estimate potential benefits from the nursery programme, but there is less evidence of comparability for Family Learning, and we are forced by the diversity of the few pieces of evidence at hand, to be inconclusive for Youth Services. Of course this last result in no way reflects badly upon the Youth Services of NCDA, but given the studies at hand, the benefit to cost ratio could be positive or negative depending on which programme is used as a comparator.

We are, sadly, a long way from being able to add up our benefits or provide some sort of rate of return for the activities of NCDA as a whole. We have only sampled a subset of their work and we do not have evidence to judge other activities, some of which would probably be even more difficult to assess than for the areas we did look at. However, on the basis of what evidence we can find it is likely that the rates of return on expenditure to their activities compares favourably with other forms of investment. Careful readers will notice that we have not directly measured how well NCDA carries out its activities in comparison to other potential providers (or to other uses of the money). We have had to assume that the comparative evidence we have found from Perry and from SRU can be applied to NCDA.

We have also not taken account of the synergies possible by having a range of activities available from one organisation. Family problems that might become apparent from contact with one of NCDA's activities might be addressed by other parts of the organisation, providing some sort of positive externality between activities.

Getting better at evaluation is a journey, and some steps along the way are easier to take than others. NCDA are committed to doing better and you have suggested how they might do more, but the steps have increasing resource implications.

When one considers the demands of statistically sound economic evaluation, it is clear this is beyond the financial and time resources of NCDA. The costs data provided for us were fine, and adequate to our needs. The difficulties were more-or-less all presented by attempting to evaluate benefits. Here is a list of considerations:

1. *Getting more feedback.* Short of statistically sound measured benefits, evolving evaluative questionnaires, focussed on getting good examples, for each of the services makes sense.
2. *Ensuring documentation (handbooks etc.) is up to date and available* would be helpful in aiding comparisons with similar interventions which have been delivered and evaluated elsewhere.
3. *Collect more simple output indicators.* This is a generalisation of point 1. Where possible NCDA might want to consider trying to collect some indicators of outputs. Ideally one would want outcomes but this is likely beyond the resources of the organisation. However, there can be benefits from collecting, on a consistent basis over time, measures of output. The simplest outputs are the numbers of people who come into contact with NCDA. Although NCDA does have these recorded they are not collated in a manner which helps analysis. As we have noted, headcount alone is not enough – we wondered whether single interactions are as valuable as longer term contact and tried to find a reasonable answer. NCDA might like to consider this

further, and then collect data in a suitable way. For example, for the youth service to have a record of the number of contacts who only came once and the number who came more than once.

4. *Benchmarking cost effectiveness*. On a similar tack, it would be useful if NCDA knew how they stood on costs in comparison with alternative providers. Knowing NCDA's relative cost position would be an important part of economic evaluation.
5. *Covering more services* Estimates of potential benefit to cost ratios such as those we have provided here could be extended to other services of NCDA, subject to the same limitations and caveats. One aspect of building capacity that might emerge from this exercise is to establish a long-term relationship between Sussex Economics and NCDA where our more senior students, with faculty support, could perform the desk research required to build a fuller set of benefit-cost ratios. This would provide benefits to both parties
6. *Alternative providers*. We have assumed throughout that if NCDA were not providing their services, this capacity would be lost to the communities served. That is a contentious assumption, of course. Clearly, if the market were saturated with such services, then the benefits of NCDA's would be smaller. It is important for NCDA to confront this issue when arguing for support. As a challenge to evaluation, it requires a study of a comparator community, or in the jargon, a *control group.*

Appendix

Summary of meetings with NCDA	List of personnel involved
15th November 2012	*University of Sussex*
6th December 2012	Michael Barrow
7th February 2013	Olga Jbelli
14th February 2013	Julie Litchfield
19th February 2013	Andrew Newell
13th August 2013	

Estimating the benefits from a spell of nursery.

Our simple assumption is that the benefit/cost ratio, *BCR*, is a function of the duration in months, *d*, of a spell of attendance. We choose a log function as follows $BCR = \gamma * \ln(1 + d)$ and calibrate at 1.84 for *d* =24, i.e. the BCR for the UK model of the High/Scope Perry intervention for a treatment length of 24 months (see Table 4). This generates γ=0.57 and the *BCR* after 12.9 months is approximately 1.5.

We test the sensitivity of the result to the assumption that the accrual of benefits occurs only after a period of acclimatisation, say 2 months, in which case γ would be a litter higher, at 0.59 Under this assumption, 12.9 months of nursery generates a BCR of 1.45.

Chart 1