

## Social impact bond (SIB) – Propensity score matching (PSM)

### Peterborough Social Impact Bond

This case study focuses on the first social impact bond (SIB) implemented in a prison located in Peterborough in eastern England. It seeks to shed light on the way social outcomes were measured in this particular prison.

This SIB was used to fund the experimental One Service programme. Impact measurement, which is a crucial part of the SIB, relied on the propensity score matching (PSM) approach.

A qualitative assessment, conducted by Rand Europe and focusing on the modus operandi of the programme, was also carried out. This assessment will not be reviewed under this publication, which relies exclusively on the sources stated on page 9.

The Social Impact Bond (SIB) is a financial instrument underpinned by social impact measurement that leverages private investment to support socially-innovative programmes. SIB is characterized by the fact that the private investor assumes a financial risk in the hope of financial return should the funded programme meet the “impact objectives”. In this case, public authorities agree to share the resulting savings made possible through the programme by compensating investors. Should the programme fail, the investors are not paid and public authorities have not incurred any expenditure. Therefore, it is crucial to measure the achievement of objectives.

The French government launched the French version of SIB, the “contract à impact social”, in 2016. It was introduced as a new financial instrument for innovative activities of the Social and Solidarity Economy (“Économie sociale et solidaire” or ESS).

In order to illustrate various assessment approaches of projects funded under an SIB, Avise, KPMG and Impact Invest Lab have published several case studies.

### Assessment of a programme to reduce reoffending among prison leavers

#### OBSERVATION

According to Social Finance, around 40,000 sentenced adults serve sentences of less than 12 months in the United Kingdom. Reoffending rates among this group are very high: 60% of them are convicted of at least one offense in the year after release.

#### PROPOSED RESPONSE

The funded programme aims at reducing the reoffending rate of short-sentenced prisoners (those who are imprisoned for less than 12 months). It was implemented among prison leavers from Peterborough prison, as part of the first social impact bond in the UK.

#### DURATION

Initially planned for a 7-year period, the SIB finally extended from 2010 to 2015.

#### STAKEHOLDERS

- **Three cohorts of 1,000 people** sentenced to less than a year in Peterborough Prison;
- **One service:** a cluster comprising 7 associations offering personalized forms of support from the time of incarceration up to 12 months following their release;
- **17 investors**, mainly philanthropic organizations (foundations, endowment funds);
- Third-party payer: **the UK Ministry of Justice and Big lottery fund**;
- **Social finance**, the programme facilitator, raised funds from 17 investors, prepared the contract and was involved in the programme management;
- **Independent assessors:** QinetiQ, University of Leicester, University of Greenwich and Rand Europe.

#### PAYMENT MECHANISM AND SOCIAL IMPACT

The Ministry of Justice and Big lottery fund reimburse investors (capital repayment and eventual interest rates ranging from 2% to 13%) only if the reoffending rate of eligible people to the programme is reduced by at least 10% for one or several cohorts, or if, at the end of the programme, the observed relative decrease exceeds 7.5% on average. Therefore, the impact assessment of the programme is essential.

## PRESENTATION

### THE ISSUE OF REOFFENDING

According to an analysis conducted by Social Finance in the UK, about 60% of people serving short sentences reoffend in the year following their release. Many factors explain this phenomenon: lack of income, lack of access to housing, over-indebtedness, lack of employment, low access to rights, health problems, addiction, influence of people surrounding the ex-prisoner, etc.

### A MULTI-STAKEHOLDER RESPONSE

The One Service programme, funded by the SIB, was **a consortium of seven complementary associations brought together by Social Finance.** The latter provided individualized support from the time of imprisonment until one year after release.

Each expert organization acted on their specific issues, depending on the particular needs of beneficiaries such as access to housing, liaison with mental health professionals, assistance for drugs addicts, etc.

In practical terms, the multi-stakeholder approach was organized as follows:

- **St Giles Trust:** provided social workers who supported people in the prison and at the prison gates in preparation for their reintegration.
- **Sova:** supported the prisoners with the involvement of its volunteers and a social worker, particularly on housing issues (relationship with landlords, etc.).
- **MIND:** followed cohort members on their mental health records (attendance of specialized doctors)
- **Ormiston Families** (family relations specialist): provided support to both the prisoners and their families outside.
- **John Laing Training:** offered trainings on construction trades to cohort members that were interested.

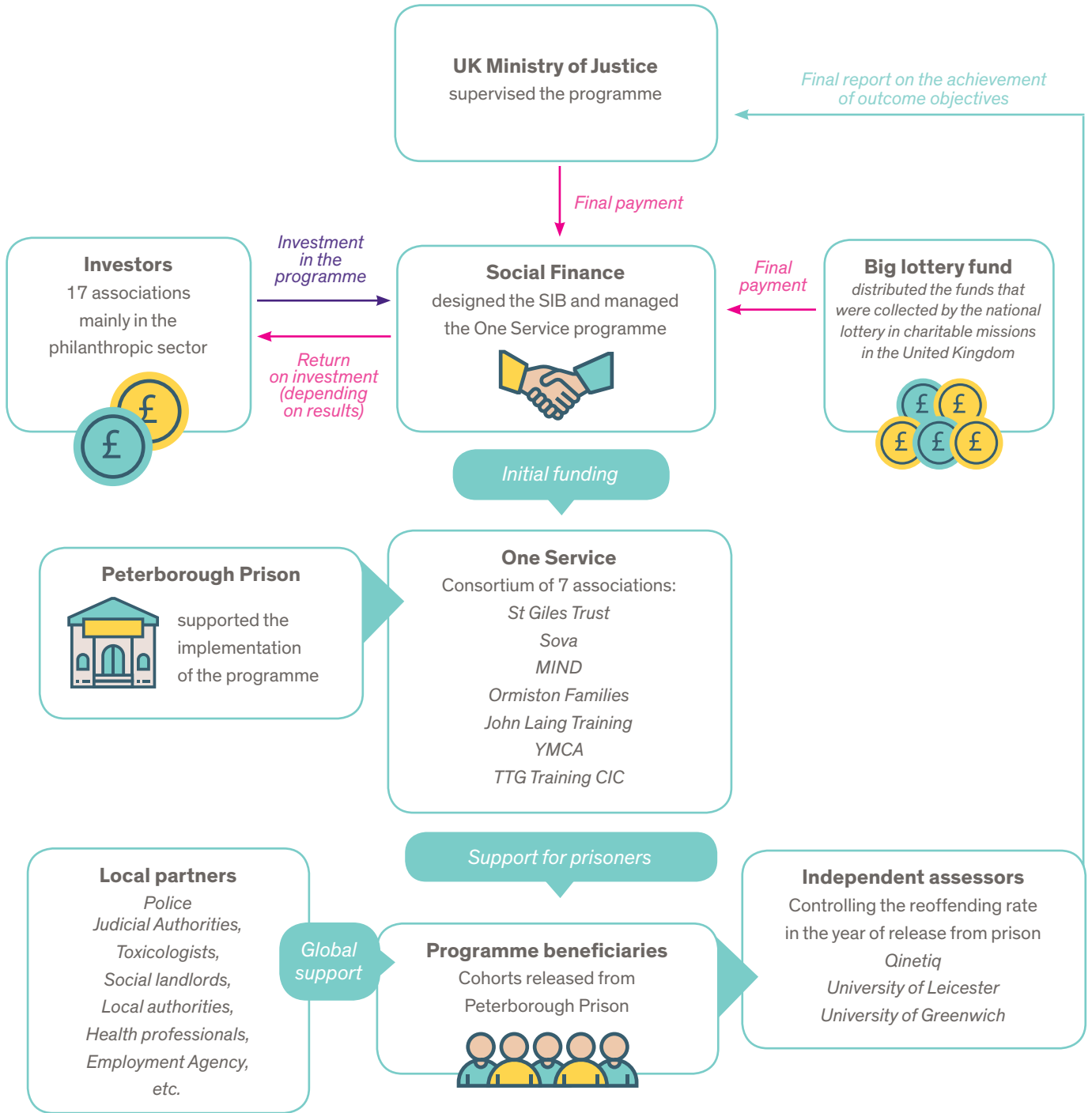
Other parties intervened on a case-by-case basis depending on the problems diagnosed for each beneficiary.

### THE BENEFICIARIES

The One Service programme targets male short-sentence offenders aged over 18 that have been released or are about to be released from Peterborough prison.

**Each eligible person chose freely to take part in the programme.**

**THE ONE SERVICE PROGRAMME WITHIN THE FRAMEWORK OF THE SOCIAL IMPACT BOND**



Source: E.Disley, C.Giacomantonio, K.Kruihof, M.Sim and Rand Europe. (2015). *The payment by results social impact bond pilot at HMP Peterborough: final process evaluation report*. United Kingdom: Ministry of Justice

# ASSESSMENT PROCESS

## BACKGROUND AND CHALLENGES

Putting together a relevant methodology and collecting reliable data were major issues for the programme, knowing that the measurement outcome would determine the payment of investors by the Ministry of Justice and the Big Lottery Fund.

As a reminder, the objective of the programme was as follows: **to reduce the reoffending rate of short-sentenced adult offenders** (less than 12 months) by at least 10% per cohort (payment for each cohort) or to obtain an average decrease observed on the three cohorts exceeding 7.5% (payment at the end of the 3 cohorts).

## MEASUREMENT METHODOLOGY

### The assessors

Independent assessors carried out the impact measurement of the One Service programme, related to the financial commitments of the stakeholders:

- Qinetiq, a British private company whose core business is defence, aerospace and security;
- University of Leicester;
- University of Greenwich.

### The method

The assessment principles had been specified in the contract between the parties, when the SIB was initiated.

The assessment results were obtained by comparing the Peterborough prisoners' cohort who were eligible for One Service, with a control group (or counterfactual) composed of prisoners from across the United Kingdom.

**Propensity Score Matching (PSM)** (see the box on the right) was used to create the control group. It was agreed that for each person in the Peterborough cohort, 10 comparable profiles from national police and prison databases would be included in the control group.

Assessors were responsible for the implementation of the PSM, which determines the remuneration due to investors.

Note: In this case study, we illustrate only the measurement of the first cohort's results. The method remained the same for subsequent cohorts.

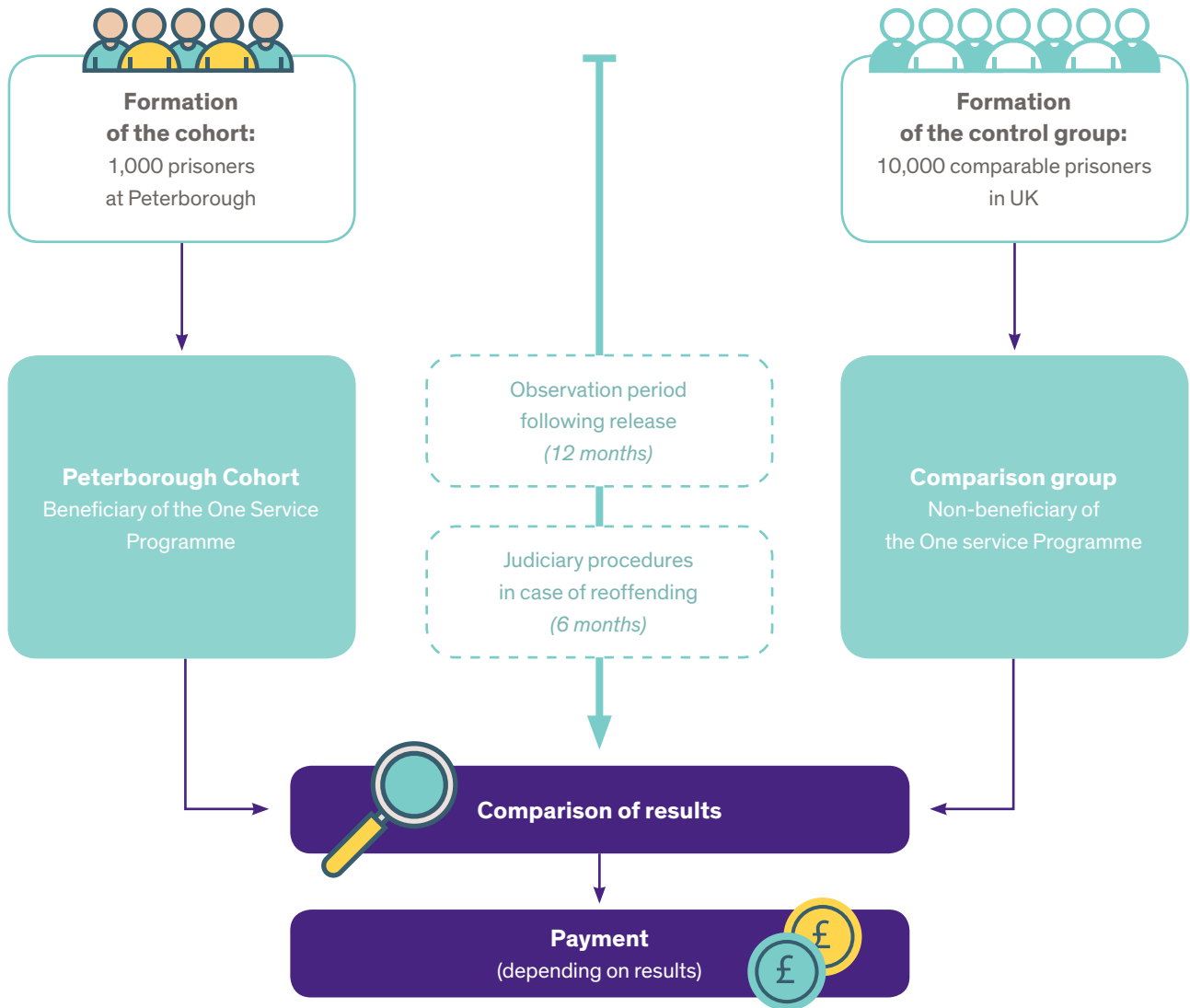
### Principles and interests of Propensity Score Matching (PSM)

Counterfactual impact measurement methods rely on the analysis principle that the comparison between a treatment group (recipient of an intervention) and a control group (non-beneficiary of the intervention) makes it possible to show a causal link between an action and its effects.

PSM is a so-called "quasi-experimental" data analysis technique. It aims to put together a control group comparable to the group benefiting from the intervention, from a database and verifying the comparability on several criteria considered as statistically significant. People in this control group are not aware of the process. The intervention does not affect them.

PSM differs from a randomized evaluation, which proposes to constitute at random two follow-up groups composed of volunteers (thus informed of the process), one benefiting from the intervention, the other not.

► How the evaluation process works



Source: A. Nicholls and E. Tomkinson. (2013). *The Peterborough Pilot Social Impact Bond*. United Kingdom: University of Oxford.

## ASSESSMENT PROCESS

### RESULT INDICATOR

The measurement is based on a single indicator, decided in advance by the stakeholders: the frequency of convictions (by a court) resulting from offenses committed in the 12 months following the release from Peterborough prison\*.

**The choice of this indicator was key insofar as it determines whether or not investors are paid by the Ministry of Justice and the Big Lottery Fund.**

This is an explicit indicator, for which data already exists. The fact of measuring only one result indicator facilitates the payment decision and may, a priori, leave room for the social operator to adjust the operating mode.

*\*In order to take into account judicial processing, the sentence must have taken place within 18 months of the release. This extends the measurement period to 18 months instead of 12 months (see diagram above).*

### COHORT CONSTITUTION

**The rule of constitution of the cohort had been agreed contractually.**

The cohort consists of prisoners who are eligible for the One Service programme and released from Peterborough Prison within two years, for a maximum of 1,000 individuals. Thus, the first cohort included all eligible persons released from Peterborough prison between September 9, 2010 and July 1, 2012 (the 1,000-person limit was reached in June 2012). Each individual in the cohort was free to participate or not in the One Service programme.

### DATA COLLECTION AND PROCESSING

#### Databases

The data was collected mainly in two public databases: the criminal records information provided by the National Police and the prisoner record system. They each contained different information on prison exists, such as demographic variables (age, nationality, ethnic data) or criminal record (length of imprisonment, type of offense, etc.).

*Note: the use of such data may sometimes require obtaining permissions in order to preserve anonymity. These legal aspects are not part of the spectrum of this study.*

#### Data extraction

The Ministry of Justice carried out data extraction. Independent assessors made sure of the conformity of the extraction: verification of the computing code used, inspection of any anomalies, etc. In order not to influence the assessor in the formation of the cohort and the counterfactual, the information concerning reoffending was excluded.

#### Data processing

At this stage, it was necessary to assess the relevance of certain information, and, if necessary, to clean up the data. Some profiles – whose data were not usable – were removed from the dataset.

**Several stages of processing were necessary to obtain a dataset of 31,114 inmates from all UK prisons. Among them, 936 were in the Peterborough cohort.**

## DATA MATCHING

Thirty-eight statistically significant variables were used for the purposes of matching. The comparability of the “Peterborough cohort 1” with the “other prisons” groups was tested using these variables.

A profile was considered “similar” to another when compatibility was observed for 36 variables out of 38.

For each individual in the Peterborough cohort, 10 “similar” individuals were then selected from the 31,114 inmates dataset.

**Thus, following the match, the control group consisted of 9,360 individuals from other UK prisons.**

After running several tests, no significant difference was found between the two groups on both the demographic variables and the judicial history of the individuals.

For example, the average age at the time of release from prison was 33.3 years for the control group and 33.4 years for the Peterborough group. Both groups were then considered comparable.

## RESULTS ANALYSIS

Once both groups were formed, the cohort and the control group, the assessors observed the reoffending rate for each group and compared the results.

In the Peterborough cohort, they recorded 1,330 new convictions for offenses committed within 12 months after the release, equating to 1.42 convictions per person.

In the control group, over the same period, there were 14,523 convictions for 9,360 individuals, equating to an average of 1.55 convictions per person.

**There is a difference of 8.39% in the reoffending rate between the cohort and the control group.**

The SIB had clearly specified that a minimum 10% drop in a cohort reoffending rate was needed to trigger a payment. It was not the case. However, investors could expect to be paid at the end of the contract, i.e. at the end of the three cohorts, since the reoffending rate obtained in the first cohort exceeded 7.5%.

As a reminder, the payment logic of the SIB was as follows: the payment of investors (capital reimbursement and possible interest ranging from 2% to 13%) by the Ministry of Justice and the Big Lottery Fund, is only carried out if the reoffending rate of persons eligible for the programme is reduced by at least 10% in one or more cohorts, or if, at the end of the programme, the relative decline observed in the three cohorts exceeds 7.5% on average.



## CRITICAL ANALYSIS OF THE ASSESSMENT METHOD

### PARTICIPATORY NATURE OF THE APPROACH

**The stakeholders of the SIB have all been involved in the process whether it was a social operator or the parties concerned financially by the results.**

They agreed on the choice of the indicator, on the choice of the measurement method and implemented the data processing operation (searching for information, considering data to exclude or include, etc.).

Social finance played a particularly important role throughout the SIB, organizing the contract while piloting the One Service programme. The beneficiaries, who were rather absent in the implementation of the quantitative assessment, were solicited in the qualitative measure that was conducted in parallel by Rand Europe.

### SETTING UP A COUNTERFACTUAL

Stakeholders decided to set up a counterfactual (control group) to measure the effects directly attributable to the programme.

**The PSM method used to build this counterfactual seems to have a limited number of biases, thanks to the selection of similar profiles to those of One Service recipients.** Choosing 10 individuals in the control group for each beneficiary cohort was a way for the stakeholders to make sure of it.

Tests have made it possible to check the similarity between the two groups and thus to attribute the results to the One service programme with a high degree of confidence.

The counterfactual and the cohort can thus be considered of equivalent quality since the same rigor was applied in the choice of the profiles. The data, which were hardly questionable, were based on observable facts and were updated regularly.

### DATA QUALITY AND RELIABILITY

The assessment key indicator – the frequency of new convictions – is a simple data from the National statistics, a public body responsible for collecting, analysing and disseminating statistics. The National Police contributes to this database.

Only data of this quality, giving the profile of each prisoner, made it possible to constitute a group of beneficiaries and a similar counterfactual using the PSM method. In order to obtain a reliable result, the assessors chose to exclude from the statistical model any person whose data did not seem relevant.

### CONTROL OF NEGATIVE INCENTIVES

**The assessment system that was put in place encouraged One Service to support its beneficiaries over time.**

Choosing the “frequency of new convictions” as a key indicator encouraged social operators to persevere. Indeed, this choice encouraged One Service to continue to support the beneficiaries even after a first reoffending and to be particularly interested in the people most likely to reoffend.

This would not have been the case with a binary indicator such as the “number of prison leavers having reoffended”. In fact, in this case, the social operator would have been encouraged to abandon the support of a beneficiary after his first reoffending.



## ASSESSMENT COST CONTROL

No information was published regarding the total cost of assessing One Service. **There were many indications that it was necessary to involve a great deal of expertise over a significant period of time:** the involvement of several analysts, a large amount of data to be collected, processed and cleaned, in order to develop the counterfactual.

## INDEPENDENCE OF THE ASSESSOR

The assessors were selected through a call for tender published by the UK Ministry of Justice. In agreement with their partner Social Finance, a group of assessors including Qinetiq, the University of Leicester and the University of Greenwich, was selected. The assessment methodology was set out in the contract beforehand by the stakeholders and could therefore no longer be interpreted or modified whilst the programme was underway.

**Given the information available, it appears that the assessors acted independently.**

At various stages of the assessment, the Ministry of Justice and Social Finance were able to solicit assessors regarding some disagreements such as the inclusion or removal of certain data. The assessors intervened only to provide their insights on methodological issues.

## PREPARATION FOR SPIN-OFF

The assessment system that is the subject of this study as made it possible to verify the capacity of One Service to tackle reoffending after release. Nevertheless, the assessment system was not intended to provide a precise understanding of the conditions that favour it (targeted profiles, key aspects of support, explanation of failure cases, etc.).

In fact, in order to consider scaling up the programme, the evaluation needs to answer the following questions:

**Under the conditions set, does the programme improve the situation of beneficiaries?** Based on the chosen indicator, the reoffending rate for the Peterborough cohort was reduced by 8.39%. The effectiveness of the programme in reducing reoffending would therefore be verified.

**Why and how did this programme reduce the reoffending rate of beneficiaries?** An impact assessment based on a single quantitative indicator does not provide sufficient information to answer this question. The qualitative assessment conducted by Rand Europe on the One Service programme was intended to provide additional information to answer this question. However, this issue is not discussed in this study.

## LESSONS LEARNED

The PSM method and its counterfactual allowed for a consensual and uncontested assessment by the stakeholders, which is essential when it comes to funding using a SIB.

After several tests, cohort 1 and the control group appeared to be comparable. This method allowed every eligible Peterborough inmate to benefit from the programme, if they so wished.

It would not have been possible, for example, to set up a randomized, ethically and legally limited trial: some Peterborough leavers would have had access to One Service, while others, at random, would not have been able to benefit from it.

On the other hand, this type of method requires access to a sizeable, reliable dataset that needs to be processed. These data must be able to be used in accordance with the law and ethics.

**The cost of this assessment has not been made public. The effort associated with it is certainly high and requires the involvement of experts.**

Finally, the choice of the variables used to form the control group has to be put in perspective. For example, it might have been interesting to include information on the proximity of the prison to the usual living area of prison inmates. This is undoubtedly a determining factor to facilitate the reintegration of prisoners. 63% of prisoners in Peterborough live near the prison (in the Peterborough area)\*, what about those in the comparison group?

\*Source: Nicholls, A., Tomkinson E. (2013). *The Peterborough Pilot social impact bond*. United Kingdom: University of Oxford.

**FURTHER READING**

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In a world where the performance of economic stakeholders is mainly measured by their financial performance, making social impact assessment systematic will help to assert the value of another economic model that promotes sustainable and positive social transformation in addition to improving the social performance of social utility structures.

To this end, Avise develops and runs a national resource centre on social impact assessment, which is dedicated to:

- providing information on knowledge and progress related to social impact assessment
- equipping social utility structures and their ecosystems with tools to improve their skills
- experimenting with new assessment practices
- coordinating stakeholders in their diversity in order to create convergences.

Avise also runs Social Value France, the leading network in France devoted to social impact assessment, bringing together assessment practitioners, ESS organisations and public and private funders.



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