Evaluation of the Outcomes and Implementation of the Think Family Database and its Associated Products

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Contents

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1. Executive Summary

Introduction

This evaluation sets out to understand the effectiveness of the Think Family Database (TFD) and its associated products in Bristol City Council, as developed by the Insight Bristol Team. The TFD is an innovative digital product that brings together and visualises various disparate datasets to give a single digital view of children and families to support practitioners in Children's Services. Embedded within the TFD are also other products, such as different 'targeted risk models' which stratify data, providing additional insight to support identification of vulnerable children.

As part of this evaluation, we carried out quantitative and qualitative research to determine the outcomes that the TFD delivers for Children's Services practitioners and managers. We also evaluated the process by which the TFD was implemented to offer greater insight into how these outcomes have been achieved and how they might be enhanced going forward, within Bristol and beyond.

Methods

We made use of the theory of change as a framework to guide the evaluation across two stages. Firstly, interviews with those responsible for the development of the TFD took place to determine what the TFD is and how it was developed, which is outlined in *Section 3*. Through this process, implementation task areas were defined, which included project set-up, project implementation, training and support, and information governance. We also clarified key anticipated outcomes of the TFD for practitioners, managers and leaders, which we found were more effective support for frontline decision making, time-saving benefits, and improved service planning for managers and leaders. The theory of change is summarised in *Section 4*.

We then undertook a more expansive research process, involving interviews with a wider range of stakeholders, including TFD users, two surveys (around use of the TFD and TFE), a 2 day participant observation at Bristol City Council offices and data analysis to test outcomes noted above and the efficacy of how the TFD was implemented. Through doing so, we also surfaced a range of other positive and negative outcomes.

In total, we carried out 46 interviews, including current and some former staff at Bristol City Council and school staff in the Bristol area and we received a combined 127 responses to both our surveys.

Outcomes

In *Section 5*, we describe the range of outcomes that we found the TFD and its associated products deliver.

Specifically, we found that the TFD enables a comprehensive view of a child's vulnerability that can enable Children's Services practitioners to better assess risk and therefore offer better support. We also found that the TFD is an effective tool for identifying children that may be hard to find using other systems. Both of these benefits can lead to timelier responses to children's needs, regarded as valuable in often

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fast moving situations. Logically, we suspect such benefits increase the chances of positive outcomes for children and families, though this wasn't a focus of this evaluation.

By bringing different information together into one place, the TFD also saves practitioners time by reducing the retrieval burden of gathering such information and linking practitioners together faster who are working with the same family. In turn, the time practitioners save enables them to perform additional tasks, further enhancing the effectiveness of their support to children and families.

However, these benefits are not uniformly experienced by all teams, or by different practitioners in the same team. Different levels of awareness of the TFD, skills and knowledge of how to use it, and preferences for other source systems may be factors to explain why the impact of the TFD is not greater. We also found that whilst the TFD visualises a comprehensive range of data, in some instances this may go beyond the scope of some teams' requirements.

Whilst there were some standout examples of aggregated and anonymised TFD data driving more effective commissioning decisions, we found this an area of lesser impact. This is due partly to the nature of strategic decision making needing a far more detailed picture than a standalone self-service tool can provide. In this sense, the strategic use case is less easily satisfied by a digital product such as the TFD.

A similar range of positive outcomes were evident among users of the Think Family Education (TFE) product. By offering a more complete picture of a child, the TFE helps school staff offer more appropriate and timely support. As with the TFD, the TFE is effective in identifying children, often with limited initial information, and linking different professionals working with a family. Both of which enable school staff to save time that can be usefully invested elsewhere.

Users also described the TFE giving them a "whole school picture". and as such it was more likely to be used for planning and monitoring activities that have a strategic purpose, which wasn't as much in evidence with managers using the TFD.

We found the weakest element of the TFD was the targeted risk models. These included models for assessing risk of not being in education, employment or training (NEET); child criminal exploitation (CCE); and child sexual exploitation (CSE). Although these have been or are about to be decommissioned, they formed part of the TFD and (NEET model only) the TFE during our research. Overall, the CCE and CSE models were regarded as inaccurate in terms of identifying vulnerable young people and didn't provide clarity around what risk scoring means, although in the past this wasn't the case. As such, they were often not seen as meaningful or instructive, leading teams to stop using them.

Having said this, our research highlighted the challenge of providing certain types of information to professionals that have no other means of accessing this, for example, insight around victims of crime and exploitation. As such, we note the innovation and aspiration of models such as the CCE and CSE, whilst acknowledging more development may be needed going forward.

The NEET model was regarded as more accurate by practitioners, and we found evidence of it being used to identify at risk students who might otherwise "go under the radar". However, we found that lack of awareness of the model, time to implement its outputs and some concerns are barriers to usage for secondary school practitioners. Among primary and SEND school practitioners, low usage was mainly due to a perceived lack of relevance of the model, as well as constraints on time to embed the model in operational processes.

For all risk models, we were unable to understand which variables the models use or how they were built, and as such could not perform a statistical assessment of their accuracy, as was our initial intention. The need for detailed documentation of how risk models are developed, the variables they use, as well as other aspects of the TFD build, are acknowledged as key recommendations for Bristol and other projects in this work area.

Our assessment of outcomes also included a cost-benefit analysis, which incorporated all development and maintenance costs, weighed against a calculation of time-saved as a monetised figure. This was calculated on an annualised basis and adjusted for inflation to give an overall financial total of benefits since the TFD's inception. The contribution of the TFD to service users' positive outcomes wasn't included, due to the complexity of calculating this. Our analysis showed that for every £1 spent, the TFD has driven £1.30 of time-saved value. This should be seen as a proxy indicator of value rather than representative of bankable savings, and comes with a range of caveats, which are outlined in *Section 5.5*.

Implementation

In *Section 6,* we outline the findings from our process evaluation of how the TFD was developed and implemented, which offers valuable insight around many of the outcomes that were identified.

We found the Insight Bristol team adopted an innovative and ground-breaking approach, both in terms of how they supported teams with access to data, and the scope of their ambition. We found doing this was particularly challenging, given the potential risk aversion within Bristol City Council at the time, which may have stifled development. On the whole, user needs guided the development of both the TFD and TFE, which was also supported by a deep understanding of the nature of work within Children's Services and what information may be needed. This led to the bringing together of a wide range of data, which was visualised to give a clear and comprehensive picture of need at a family level. Importantly, external data was refreshed on a daily basis, enabling far more timely responses to evolving situations than was previously the case.

We found the approach to rolling the tool out was person-centred and well-received by staff teams. However, it lacked systematic planning in terms of strategic communications, addressing training needs, and tracking outcomes on an ongoing basis. These were key factors in accounting for differential usage of the TFD and the experience of benefits between different staff groups.

Our review of information governance (distinct from project governance, above) found that this was a particular focus for the Insight Bristol team, who invested considerable time and attention in this area. We found the approach to data sharing used legal bases and as such was trail-blazing given when it was conceived. Many other local authorities and statutory bodies have adopted a similar approach since. Given this level of innovation, we found that Bristol Children's Services may still have work to do to educate its own practitioners and make its approach to data sharing more transparent, particularly in respect of risk modelling. Also, as noted above in terms of access to datasets across different safeguarding roles, we found that there may be scope to develop more specific use cases on a team by team basis to provide greater assurance around the principle of minimisation.

We found that a necessity for innovation meant that formal project governance was not implemented for many years, which, while enabling agility, may have had a number of unforeseen consequences. For example, it was sometimes challenging for important decisions to be taken in a timely way, such as discontinuing the CCE / CSE risk models when it became apparent that they were not accurate. It also meant that the TFD was not integrated fully into the technological ecosystem of Bristol Council, leading to duplication of functionality across other systems. A lack of governance may have created a reliance on individuals to champion the TFD, leaving it vulnerable when these people leave.

Importantly, we found that many of the weaknesses described above can be attributed, at least in part, to budgetary constraints. Finite team resource within Insight Bristol necessitated decisions around where to invest time and focus, which often were made in service to developing functionality.

Since we worked closely with Bristol City Council through the course of this evaluation, much of the learning has been captured and incorporated as improvements that are already underway. For example,

developing a business case for increased investment, strengthening governance processes, documenting and capturing knowledge in relation to the TFD and risk model development, and implementing a process whereby benefits and impact can be tracked on an ongoing basis.

This evaluation has been written alongside the development of a 'How-to' guide for implementing a TFD approach. The process of writing the 'How to' guide has similarly crystallised a number of lessons that have been implemented by both Bristol and Somerset as part of their approach in this area.

Recommendations

In *Section 7*, we draw together key findings and conclusions in relation to outcomes and implementation.

In *Section 8* we lay out two sets of recommendations. Firstly, those that are relevant for Bristol City Council in terms of developing its approach and enhancing the impact of the TFD. These relate to findings around areas for improvement within Section 6.

A second set of recommendations is included for other local authorities looking to emulate Bristol's approach. Broadly, these centre around implementing more structured governance; making a business case for increased investment to support activities such as training and iterations to functionality; and how improvements may be realised in relation to risk modelling. All of which we envisage could enhance the impact of the TFD and its associated products. Since these recommendations align closely with what is included in the 'How-to' guide for implementing the TFD-like product (also developed by Social Finance), we have included references to the guide where appropriate.

Declaration of interests

Social Finance itself declares no conflict of interest in respect of this report.

We acknowledge that Gary Davies, who was head of the service tasked with developing the TFD in Bristol City Council, subsequently supported Somerset Council to develop the funding proposal to evaluate the TFD - of which this report is the principal output. Additionally, he was involved in overseeing the evaluation process on behalf of Somerset - as a member of the Governance Group, by attending the Technical Advisory Group, and by attending a fortnightly progress update to the Department for Education.

Social Finance took measures to manage any potential conflict of interest by ensuring that Gary was not involved in decisions around the design of the research process, the structure of the report, its findings or recommendations. Although he attended the above groups, he did not chair these or have a role in preparing, reporting on or providing specific advice for these meetings.

2. Introduction

2.1 Context for Evaluation

In May 2022, in response to the release of the independent review of children's social care and the national review into the murders of Arthur Labinjo-Hughes and Star Hobson, HM Government committed to take action to drive forward three data and digital priority areas:

- Improving Children's Social Care data collection, and how data is shared to inform decision-making,
- Improving case management systems (CMS) to reduce burdens on the frontline and support practice,
- Using technology to achieve frictionless sharing of information between safeguarding partners.

To support this, in October 2022, the Department for Education (DfE) launched the 'Data and Digital Solutions Fund' (DDSF), inviting Local Authorities (LAs) to bid to deliver a range of projects relating to the three priority areas set out above.

Project 1c of the DDSF asked for an independent evaluation of data analytics tools within LA settings. This evaluation would seek to understand how effectively data analytics tools can support both operational and strategic decision making within children's services, and how tools developed in one setting might be transferred and adopted by other LAs. Somerset Council were successful in a bid to evaluate the Think Family Database (TFD) and its associated risk models and to draw out key lessons for how such an approach may be operationalised. They partnered on this project with Bristol City Council and Social Finance.

This evaluation sits alongside a 'replication guide' for the TFD, which is principally aimed at audiences in other LAs who are considering embarking on this approach.

The idea for the TFD initially emerged around 2015 from the Troubled Families Programme in Bristol City Council (see Appendix 1 for more info), later known as the Supporting Families Programme. It was made possible, in part, using the grant received through this programme.

Complex cases like the one presented in the Data Ethics Report completed in 2022 as part of the DLUHC Data Accelerator Programme in Avon and Somerset, highlighted common challenges in supporting families and individuals with multiple disadvantages.

> *"Parent A was at risk of being evicted from her home as a result of her rent arrears. However... there were other problems recorded for the family that might be contributing to their housing situation. Parent A's husband had recently lost his job and their children were not going to school following reports of bullying". (Data Ethics Report 2022, p.8)*

Communication across agencies of these complex issues related to this case would have been difficult before the TFD. Support workers and other professionals assigned to the case might not have had

visibility of all the challenges or had access to information on who the other related case workers were, to be able to reach out.

The programme required Bristol City Council to collate data on families with multiple disadvantages and design new services to support them. Payments would be received after positive outcomes could be demonstrated, known as the Payment by Results (PBR) process. After the PBR process and the completion of each reporting cycle, the data was deleted in line with the requirements of the programme.

At the inception of Phase 2 of the Supporting Families programme, the local lead for the programme in Bristol City Council, who managed the emerging Early Intervention teams (known then, locally, as 'Early Help'), concluded that the data had most value in the hands of practitioners across children's services. It was felt that it had the potential to offer several benefits, particularly around enabling communication between different council stakeholders, thereby enabling multi-agency work.

2.2 Rationale for the creation of the TFD

The TFD was originally designed for use in conjunction with the Supporting Families programme (formerly Troubled Families), with the goal of supporting practitioners to embed a 'whole family approach', rather than responding to individual events.

The TFD was set up to support targeted early intervention and prevention, and in turn to improve outcomes for vulnerable children and families. The decision was taken to allocate some of the grant received through the Supporting Families programme to set up a partnership data analytics team, named Insight Bristol, including staff from Bristol City Council and Avon and Somerset Police. The vision was to add to, and better utilise, the data gathered through the first phase of the Supporting Families programme, giving a view of this to frontline practitioners. In doing so, identifying the families most at risk meant that targeting interventions could be done more effectively. Specifically, it was felt this would be achieved by:

- Showing a more 'complete' picture of the issues and risks facing a family, by displaying data to practitioners that they previously couldn't access,
- Saving practitioners time and effort in accessing a range of disparate systems to find the information they need to know about children and families,
- Linking practitioners with others who are currently working or have previously worked with a family to improve the coordination between practitioners.

3. What is the Think Family Database and its associated products?

3.1 Think Family Database

What is the Think Family Database (TFD)?

The TFD is a multiagency data warehouse comprising a range of datasets from across the public sector. It was in development until 2015 and has since had a progressive roll out, adding functionality and users in the years since.

At a headline level, the sum of the historical cost of developing the TFD and its associated tools has been £346,941 (£521,75 in 2023's value, if we adjust for inflation and time value of money). The cost per year of its maintenance and continuous development is approximately £95,550. For a detailed breakdown of costs, see Appendix 9.

The database contains data pertaining to around 54,000 families across the Bristol area and processes around 5,000 searches per month. The source of this data comes from a set of approximately 35 social issue datasets from across the council and its partners, services such as children and families, housing, education, revenues and benefits, and external partners, such as the police and the Department for Education. Data from these datasets is then matched to create a unified picture of individuals, that is then grouped into families and linked to addresses. The data is presented to practitioners in the form of both risk indicators and descriptive procedural text. According to practitioners involved in the creation of the TFD, the aim was to give as accurate a picture as possible of the situation of the individual the professional is looking at.

The TFD consists of two main databases, and a third that holds derived figures. These systems then enable three main processes to deliver data to front-end users: staging, warehousing, and analysis. For more detail on this and how data is transformed, see Appendix 4.

Practitioners access the data through an internally available website and apps. The site provides several 'views' which present information from the TFD in different ways, including focuses on individuals, families, and professionals involved in a case. A permissions system ensures only specified professionals who have attended training delivered by the Insight Bristol team can access the views required for their work.

Figure 1: Person level view of the TFD provided by the Insight Bristol team

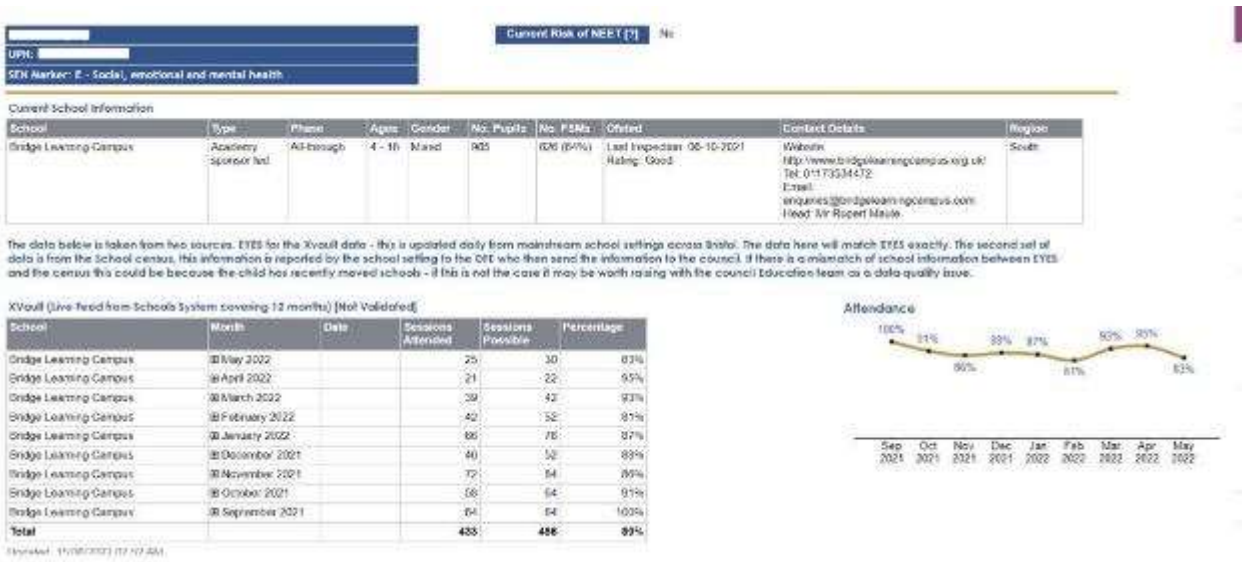
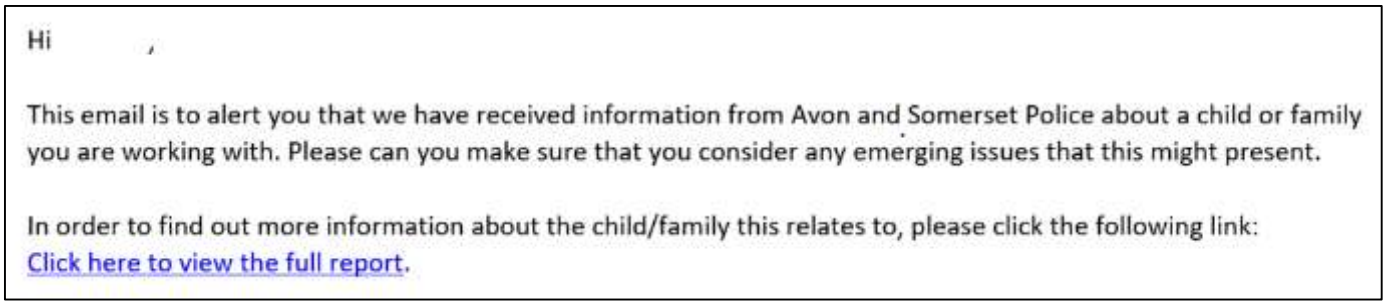


Figure 2: TFD School view (not TFE) 2022

Think Family Notification (TFN)

There are certain events that are cause for particular concern (school exclusion, committing crime, domestic violence, going missing) and therefore require the attention of the lead professional as soon as possible to support faster action. The TFN was made to address this need by reaching out to professionals when one of the trigger events is registered on the TFD.

The email sent out by the TFN does not contain any personal information outside of the name of the young person, along with a notification telling the lead professional to look at the TFD for further details.


Hi ,

This email is to alert you that we have received information from Avon and Somerset Police about a child or family you are working with. Please can you make sure that you consider any emerging issues that this might present.

In order to find out more information about the child/family this relates to, please click the following link:
Click here to view the full report.

Figure 3: Example of a TFN notification

Legal Basis for Work

The Insight Bristol team, with support from an information governance specialist, developed and tested the use of 'legislative gateways' as the basis for sharing information within the TFD. Using legislative gateways instead of consent for data sharing means that instead of asking for individual permission each time data is shared, specific laws or regulations allow certain types of data sharing to occur automatically or under predefined conditions. Broadly, legislation was selected to support purposes of safeguarding and promoting the wellbeing of vulnerable families. For a list of specific legal acts and additional detail, see Appendix 5.

Development and maintenance

The teams involved in developing and maintaining the TFD are as follows:

- Insight Bristol - Originally developed the TFD. They are based under the Bristol City Council Early Intervention umbrella, with strong collaboration connections to Avon and Somerset Police. The team maintains and continues to develop the TFD with funding from the Supporting Families Earned Autonomy grant.
- Avon and Somerset Police - Worked with Insight Bristol to develop the TFD. They continue to supply data to the Insight Bristol team on a daily basis. They also created two of the three targeted risk models (CCE, CSE).
- Bristol City Council Information Governance Team - Support the Insight Bristol team in ensuring a robust approach to information governance and ethics.

For more details on team structure and history of how the team developed the TFD, see Appendix 3.

Who uses the TFD?

Today, the TFD front-end is used by around 450 frontline workers from Bristol City Council in total, with around 150 daily users. Broadly, there are four main user groups, these are:

- Triage practitioners - frontline workers who process information in a rapid way to review referrals and triage them to the appropriate team.

- Early Intervention practitioners – frontline workers who work directly with children and families who have not yet reached the statutory threshold for intervention.
- Social Care practitioners - frontline workers who work directly with children and families where the child has reached the statutory threshold for intervention.
- Managers and Service Leads - leaders who access anonymised / aggregated data to inform strategic decisions, such as resource allocation and commissioning.

In our research, we also spoke to a small number of 'Other' practitioners and managers who don't sit within Childrens Services, for example Housing or Education professionals. Given the small number of this sample, whilst we do include their viewpoint where relevant, we haven't treated them as a main user group in this evaluation.

Over time, both the usage of the product and the variety of teams accessing it have increased. The userbase has expanded beyond Children's Services, with usage closely monitored and audited. The below charts show total usage of different teams, usage over time, and usage of different pages on the TFD.

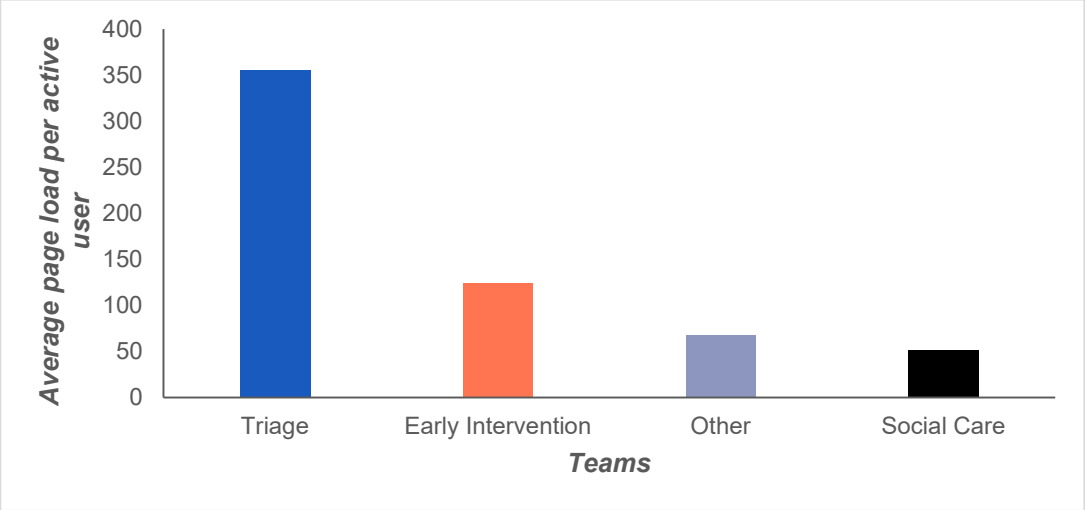


Figure 4: Average page loads per active user per team (2023)

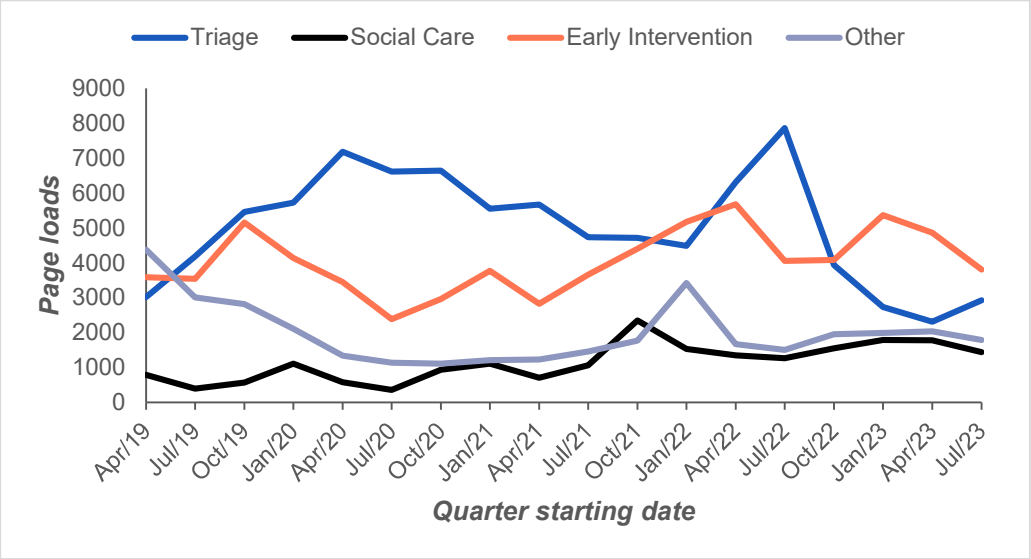


Figure 5: Quarterly average page loads per team over time between April' 2019 and Oct'2023

For more detailed information on chronology of the roll out to different teams and how different teams use the TFD, see Appendix 6.

3.2 Targeted Risk Models

What are the targeted risk models?

Different analytical techniques were used to create the targeted risk models, including index scoring and social network analysis, for example initially with the CSE and CCE models. However, over time the risk models used more predictive analytics, whereby common factors present in a target group of young people (see below) over a range of data points were used to create a data 'blueprint'. This model was then applied to the wider population to identify those who match this and assign a vulnerability score.

The models do not account for any 'insulating factors', such as community connections and social networks, and only match 'negative' data, or information that might increase risk, such as poor school attendance, records of crime, etc. There is, therefore, a need to rely on case workers to account for other information or more contextual data not captured in the model. In this way, the risk models are not designed to make decisions, but to supplement the worker's understanding of vulnerability by offering a risk score to support risk assessment.

Three targeted risk models have been created. These are:

- NEET model – to identify those at risk of not being in education, employment or training. This model is composed of three internal logistic regression 'sub-models' trained on a cohort of 1,000 individuals, which feed into the final NEET model risk score. They are: the attendance model, attainment model, and Supporting Families model.
- CSE model – to identify children at risk from sexual exploitation. This model was trained using the Barnados Against Sexual Exploitation (BASE) cohort of around 1,000 children known to have

been sexually exploited, alongside a set of children assumed not to be at risk, taken from the Police database.

- CCE model – was used to identify children at risk from criminal exploitation. This model used 27 predictor variables, all drawn from the Niche database (the Police's crime recording system). The variables are counts of occurrences within certain time periods where a child is reported as missing, or as the victim or offender in domestic abuse, violence, a public order offence, a sexual offence, or as the victim of a vehicle offence.

The CSE and CCE models, which have been recently decommissioned, were based on data across the jurisdiction of Avon and Somerset Police and don't use TFD data as the NEET model does. This is to allow the Police to profile children across the entire Avon and Somerset Police boundary, rather than in Bristol alone.

Why were the targeted risk models created?

The development of the targeted risk models arose from a need to provide information around complex issues that practitioners were largely unable to access and therefore unable to target interventions in a timely way prior to risks escalating. Moreover, it was felt that predictive analytics and providing more sophisticated information as an aggregate of many risk and vulnerability factors, could provide insight to guide interventions to enable them to be more effective.

The circumstances and history of the development of each individual model are detailed further in Appendix 7.

Who uses the targeted risk models?

The NEET model is embedded, and the CCE and CSE risk models were formerly embedded, within the TFD, with outputs visualised for all practitioners who have access to the TFD. The CCE and CSE risk models were principally designed for 'Safer Options', Bristol City Council's multiagency response to serious youth violence and child criminal and sexual exploitation. Members of Safer Options, drawn from various different teams, had access to bespoke model outputs via a Qlik app, alongside access to the standard TFD. In this evaluation, we incorporate Safer Options as part of 'Early Intervention' teams.

The NEET model was principally designed for the post-16 education team and staff in schools, including designated safeguarding leads, deputy head and head teachers. It is also embedded in the TFE.

Figure 6: TFE Display of individual risk profile and timeline provided by Insight Bristol

Figure 7: The Power Bi TFD Dashboard for the TFE containing the outputs of the Risk Models

Development and maintenance

In 2018, Insight Bristol team leadership saw the need to try to do more preventative work following the direction of Early Help practices. Following this lead, models emerged as a collaboration between the police and Bristol City Council, taking advantage of the IBM predictive analytical software the police had recently acquired.

The original models were all built by the same person, to the same level of complexity and were interconnected at the time using TFD data. Since then, the models have been split, with Avon and Somerset Police taking over the ownership, running, and management of the CCE and CSE models. The NEET model is still owned and maintained by dedicated staff in the Insight Bristol and Early Help teams This change of ownership has also involved changes to how the models have been built, which may have led to accuracy issues that impacted their usage among practitioners in the Council.

3.3 Think Family Education

What is Think Family Education (TFE)?

The TFE is an application designed to help designated safeguarding leads and pastoral teams in education settings to identify vulnerabilities. The TFE draws its information from the TFD and school systems, including data from the targeted risk models.

Figure 8: Home page of view TFE

Why was the TFE created?

Early in the development of the TFD, one of the goals had been to facilitate early intervention by giving access to practitioners who were involved with young people long before risk escalated to such a level that necessitated council involvement. Schools and other educational settings were identified as a logical area to target, stemming from the recognition that young people spend a large proportion of their time in educational settings. The ambition, then, was to support decision-making for schools around safeguarding and support.

The Bristol Insight team, who developed the TFD and TFE found that, as with other teams, accessing timely and complete information was an issue for schools. Doing so could involve contacting different teams across the council, which was often a lengthy process. The TFE aimed at quickly providing schools with key pieces of high-level information, such as lead case worker name and contact details, along with a list of children in need at their school, which can inform initial conversations and planning about children and young people (CYP).

In addition, the Bristol Insights team noted that the transition of students between schools, and the exchange of information required, could also be problematic. Since there are information sharing requirements before a child or young person moves from one school to another, the existing manual process meant there were often information gaps at this transition. Furthermore, information could be incomplete. The TFE tries to address these issues. It can show data from a broad range of pupils, and, drawing on information from the admissions process, can also show when placements have been accepted.

Development and maintenance

Insight Bristol led the development of the TFE, involving various stakeholder teams, including schools, police and other internal council partners. An “almost a consensus process” was adopted where

stakeholders developed the feel and functionality of the tool together and confirmed the types of data that would be needed and at what level of detail.

In 2021, the first prototype was tested at the Bridge Learning Campus, a school in south Bristol, as part of a testing phase involving four schools in total. In summer 2022, the TFE began to be offered to schools outside this cohort. Today, just over 100 schools in the Bristol area make use of the TFE, with over 350 enabled users.

The Insight Bristol team are responsible for the technical maintenance of the tool, with the LA's Safeguarding in Education team (SET) taking on the engagement with the schools.

Who uses the TFE?

In the main, the TFE is used to inform conversations around support and safeguarding, and to highlight children and young people who might have been under statutory thresholds and would have potentially gone unnoticed. It is therefore used by staff who have responsibility for this area. This can vary between educational settings, but is normally designated safeguarding leads or their equivalent, head and deputy headteachers, but positions such as pastoral staff and executive heads have also been granted access.

Given the need to adhere to data protection and minimisation statutes, access and sharing of data from the TFE is controlled and is an aspect of the implementation of the TFE within schools.

3.4 Strategic and Aggregated Views and Qlik Apps

What are the Strategic and Aggregated Views and Qlik Apps?

The strategic and aggregated views use existing anonymised TFD data, to give higher level context on a broad range of different issues. This is displayed in Qlik apps, a data visualisation platform, with filtering capabilities so that trends and patterns can be explored. This aggregated and depersonalised information is also used to create bespoke views and apps. There were a range of different apps using aggregated data, some of which served bespoke needs of certain service managers. For the purpose of our evaluation, we will focus on the Strategic Demand app and the School Demand app, since these were used by a sufficient number of practitioners to make a reliable assessment of their impact.

The Strategic Demand app was available to service managers and visualised a range of commonly requested TFD information at an aggregated level, which could be filtered according to the needs of each user. The School Demand app was designed for specific Early Intervention teams managers, it brought together different datasets to demonstrate complexity across different schools as a means to plan support.

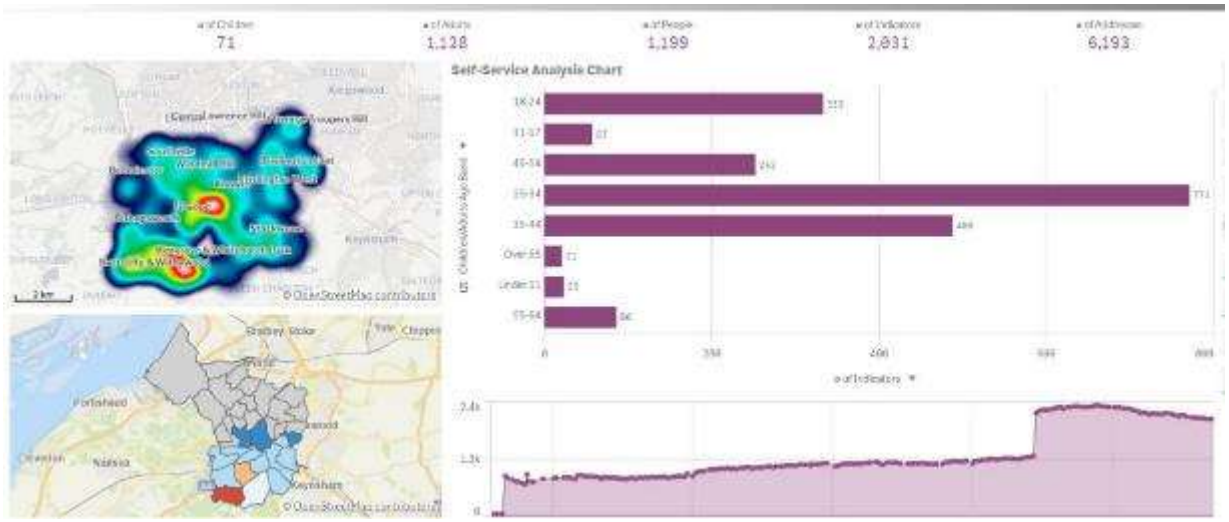


Figure 9: Qlik app view of Police App

Why were these views and apps created?

The goal of these products was to provide aggregated data on a range of areas, so that leaders could perform analysis to guide decision making, for example around provision of resource to support certain areas of schools. They were also developed to provide a tool for those making analytical requests to the Insight Bristol team to self-serve.

Who developed these views and apps?

The different views of TFD data have been developed by the Insight Bristol team in collaboration with the teams requesting and using the views and apps. Typically, in response to a request, exploratory work and prototyping is carried out prior to more substantive development work.

The Insight Bristol team also get requests from teams to build new views, apps, or provide access to new analysis. To submit this request, teams fill out a work request form, which is then received and reviewed by a centralised team and the work is then allocated to the Insight Bristol team. However, requests can also be made directly to the Insight Bristol team.

Who uses these views and apps?

The Strategic and Aggregated views are used by managers across Bristol City Council to access TFD information at a 'context level' and as part of particular use cases. Examples include:

- Early Intervention team managers (School Demand app)
- Teams that use Qlik apps for management and reporting purposes (various teams and service managers)

4. Methods

4.1 Introduction

To understand the overall effectiveness of the TFD as an approach, it isn't sufficient to understand the outcomes it delivers alone, since these outcomes are contingent on the local delivery approach taken.

Therefore, our research firstly focussed on evaluating the extent to which the TFD enables, or doesn't, anticipated outcomes for practitioners and managers, as listed in the clarified theory of change (see below). We also undertook a process evaluation of the extent to which necessary implementation activities took place and to what levels of quality. In doing so, we were able to arrive at a rounded understanding of the value and effectiveness of the TFD as an approach, as well as determining whether further benefits could be realised by improvements in implementation. Our research was therefore guided by two overarching questions:

1. What outcomes does the TFD enable for practitioners and managers at Bristol City Council?
2. How has the implementation of the TFD affected the delivery of these outcomes?

We used a two-stage process to answer these questions. The first stage involved us speaking to those involved in developing the TFD and its associated products, and senior leaders, to clarify their theory of change for the TFD and associated products. We then embarked on a longer multi-methodological research process to test the extent to which this theory of change, both outcomes and implementation activities, had been realised in practice.

4.2 Clarifying the Theory of Change

The theory of change model we adopted included problems, activities to address these problems (and how these should be carried out), and outcomes for practitioners, managers and senior leaders. We did not include an assessment of impact for service users, since extrapolating the contribution of the TFD alongside other significant factors, would be overly complex and potentially unreliable.

In February and March 2023, we conducted 10 interviews with current and former staff of Bristol City Council (Appendix 2) to firstly develop an understanding of the TFD. This yielded a decision to focus our research on the original TFD product developed for early intervention teams, aggregated views of TFD data for senior leaders, the Think Family Education (TFE) app developed for schools, as well as targeted risk models (CCE / CSE and NEET models) that are embedded in the TFD and (NEET model only) the TFE.

This process also yielded the following theory of change in simplified form, which Social Finance, as the evaluator, has iterated slightly since its original formulation, as more has been learned about the TFD and the services it supports.

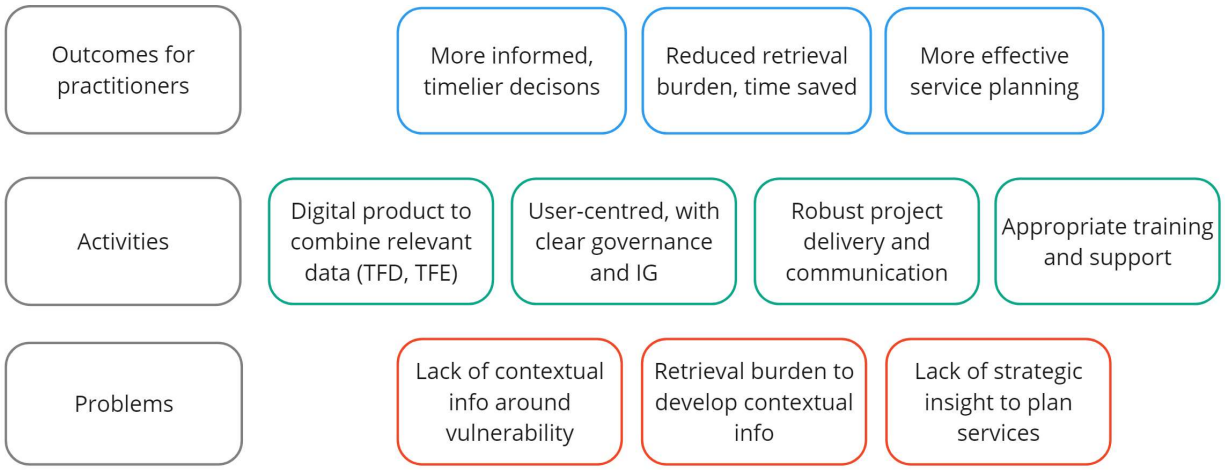


Figure 10: Clarified Theory of Change

4.3 Testing the Theory of Change

To test this model, we adopted a mixed methods research approach, combining primary qualitative and quantitative data collection methods. Doing so allowed us to understand the first-hand experiences of those who designed, built and implemented the TFD, those who use it and associated products, as well as making use of statistical information about actual TFD usage and other operational data.

For clarity, in respect of TFD users, we have segmented teams into four categories of practitioners in Childrens Services, rather than naming specific teams. These map broadly to the different use cases that were established through the TFD's development. The use cases are: Triage practitioners; Early Intervention practitioners; Social Care practitioners; and practitioners from other teams or directorates, e.g. housing or education.

Qualitative methods

Between April and November 2023, we conducted 36 in-depth interviews with practitioners, managers, developers, and information governance specialists in Bristol City Council.

We also carried out a 2-day participant observation session on-site at Bristol City Council offices. This consisted of multiple sessions shadowing team meetings, observing users engaging with the TFD. It supported our understanding of how the tool is used in practice, as well as the physical and cultural settings within which the tool operates. These interviews and observations focused on usage of the TFD, the targeted risk models and the Qlik app aggregated views.

We also undertook 6 in-depth interviews with school staff in the Bristol area, which focused on the use of the TFE.

Quantitative methods

We conducted a survey of all current TFD users, which received 66 responses, and similarly surveyed TFE users which received 61 responses. Our survey questions included perceptions of benefits, issues encountered with the products themselves, and experiences in relation to training and support.

In addition, we analysed operational usage data of the TFD (but not the TFE, as we weren't able to access this) from 2019 to the present day.

Using survey and usage data, and operational costing information supplied by Bristol City Council, we conducted a cost-benefit analysis in respect of practitioner time saved as a result of the TFD and TFE.

We also contracted academics from the Mathematics Department of the University of Edinburgh to conduct a statistical evaluation and accuracy assessment of the targeted risk models. However, source code and variables that detail how these models were created was unable to be found, which prevented us completing this element of the evaluation.

We analysed evidence from the various means of inquiry used, and then triangulated this as part of a process of bringing together different types of information to synthesise findings, conclusions and recommendations.

4.4 Limitations

There are several key limitations to the research that are worth highlighting.

Length of time since tool launch. This evaluation sought to evaluate the TFD and all its corresponding tools and applications. However, the tool was first launched in 2015 and has undergone many changes and improvements since this time. This created some challenges, since many participants were not employed at Bristol City Council at the time of its launch, and those that were, experienced understandable difficulty recalling details to do with its roll out. To mitigate this, we spoke to as many participants as possible over a range of years using the TFD.

Breadth of schools. Although the TFE has now been rolled out to over 100 schools across Bristol, due to limited availability of school staff and other unforeseen constraints, we were only able to engage with 6 schools as part of this research (2 secondary, 2 primary, 1 all through, and 1 SEND). Future research in this space should consider engaging more schools.

Survey numbers and representation. The relatively small survey size poses some limitations, and the sample is not considered to be representative. Although the survey reached a range of people from across teams, some teams (Triage and Early Intervention) are overrepresented in the survey sample and therefore are likely to have disproportionately impacted the survey results. We also suspect that regular users of the TFD were more likely to complete the survey, which may have impacted the feedback we gathered our assumptions of the benefits (particularly in relation to time saved as part of the Cost-Benefit Analysis, see *Section 5.5*) that we have made based on this.

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4.5 Evaluation Governance

To provide guidance and oversight our evaluation convened two governance groups:

Steering Group – which was comprised of senior and operational staff from Bristol City Council, Somerset Council, Social Finance and the Department for Education.

Technical Advisory Group – which was comprised of academics with specific research expertise (See Appendix 10) and was set up oversee the quality and robustness of the evaluation. It reviewed the scope of the evaluation, monitored progress and reviewed impacts and use of the findings.

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5. Evaluation of the outcomes of the TFD and its associated products

5.1 Introduction

As noted in the previous section, our evaluation of outcomes uses the 'outcomes' as defined in the theory of change as a basis to structure our analysis. To aid clarity, we have summarised each outcome using the following:

- Effectiveness – to indicate the ability of practitioners and managers to make informed, timelier and better decisions as a result of the TFD. We also capture any additional other aspects of 'effectiveness' that may be relevant.
- Time-saving – to indicate the outcome associated with reducing retrieval burden around information sharing.
- Service planning – to indicate the ability of managers and senior leaders to make more informed decisions in relation to planning and commissioning services.

We present our evidence in relation to these outcomes for the TFD, TFE and the targeted risk models in turn. We also describe other outcomes, positive and negative, that were surfaced during the course of our research. Where relevant we also present some contextual insight where some outcomes may have been impeded or prevented, but we stop short of a detailed assessment of how this has happened, since this is explored in Section 6.

5.2 Think Family Database (TFD)

According to survey data, among the 59 respondents who use the TFD, 68% agree that the TFD has a positive impact on their work, 25% neither agree or disagree, and 7% disagree. This section will explore the specific impacts that the TFD has on practitioners to account for this overall finding.

5.2.1 Effectiveness

The TFD provides a comprehensive view of a child's vulnerability that can support practitioners to better assess risk and offer better support.

According to survey findings, 66% of all TFD users said that it enhances their understanding of a child and their family. However, among those that the TFD was designed for, this figure rises to 71% for Triage practitioners and 74% for Early Intervention practitioners.

Interviews with practitioners provided many examples of how consolidated information in the TFD gives a greater understanding of the vulnerability of children they work with. One Triage practitioner described how the TFD helped them realise "that Mum and Daughter were linked to the Dad". This is representative of a wider benefit of the TFD, since Bristol's case management system doesn't link contacts together in a way that can be viewed easily or intuitively, as the same practitioner notes:

> *"The [TFD] is really useful. I was really struggling with our other system to understand the family set-up".*

As well as linking data that the local authority already holds, the TFD has enabled the brigading of wider information that has been "extremely helpful for having an overview of a child or family" (Early Intervention practitioner), including health and education data. In the words of two Early Intervention practitioners:

> *"On the health side, the TFD is very useful too as we don't have access to that otherwise (Early Intervention practitioner)*

Some workers also appreciate how this information has been transposed into a chronology of vulnerability events, allowing them to observe monthly trends:

> *"The monthly trend of attendance enables [me] to see trajectory and assess if things are improving or getting worse." (Early Intervention Practitioner)*

This holistic view of a child helps practitioners to engage in more meaningful conversations with families and offer more tailored support;

> *"The TFD enables social workers to have a better conversation with the family around the areas impacting on the children and ultimately make sure that plans address those areas effectively."* [Social Care Practitioner]
>
> *"I use the TFD to gather additional information that may not be on our recording systems or about families not already known to [Early Intervention Teams] - this can help with decision making"* [Early Intervention Practitioner]

In this sense, we found that the TFD can give information to practitioners to inform decisions that might not have been possible otherwise. For example, a Social Care worker described using the TFD to investigate whether an unaccompanied asylum seeking child they were working with was "actually supposed to be living at [an] address [and] try and unpick what was going on and if someone trying to exploit them was living there".

The TFD can be effective at identifying hard to find children that isn't possible using other systems

Triage practitioners emphasised the effectiveness of the TFD's search function in retrieving children with minimal identifiable information in referrals. A Triage practitioner shared an example where a referral lacked specific information, except for the child's school name visible on their jumper. Using the child's name, the name of the school and their location, the advisor successfully identified the child using the TFD. This type of task is deemed impossible using other databases, since they don't have access to the additional datasets to enable identification in this way.

Another practitioner highlighted that the TFD could help trace children where families may use multiple names or have changed address frequently. As one practitioner described;

> *"Sometimes it just gives you that added extra piece of information because it's drawing from other sources that we may not ordinarily use."* [Triage Practitioner]

Information and notifications provided by the TFD enable timelier responses

The holistic view of a child's vulnerability provided by the TFD enables workers to identify information that may prompt additional investigations they might not have pursued otherwise. This proactive approach allows for addressing issues at an earlier stage. For instance, a Triage practitioner highlighted that, when handling referrals related to domestic abuse, information from the TFD about the case history could prompt further investigation with other agencies:

> *"If we get a domestic abuse referral, it might be that on our system there's no other domestic abuse referrals, but looking at the TFD, we could potentially see that there have actually been three other incidents in six months. Then, we'll ask the police for that information and go through a MASH [Multi-agency Safeguarding Hub] process. So we use the TFD as an indicator of what information we might be missing and then gather information via alternate processes that we have."*

Functionality within the TFD allows workers to promptly receive police notifications, leading to earlier contact with the police to gather details about the crime that might otherwise remain unknown. As an Early Intervention practitioner describes:

> *"[Notifications] prompt me to [contact the police officer] sooner than if I hadn't heard about that notification from the police until several months later, which can happen."*

The TFD can support constructive working relationships across different agencies

Some workers find the holistic view of the TFD particularly useful for quickly retrieving context on a child when contacted by another agency. For example, a practitioner noted that:

> *"[The TFD] is really good for having a general overview. If you get a phone call from a school identifying a child with concerns, you can find them very quickly." (Social Care manager)*

The shared understanding that the TFD supports can prompt workers to collaborate in addressing concerns. For instance, a Social Care practitioner told us that, when concerned about substance use or parental neglect, they might examine school attendance in the TFD. If concerning patterns emerge, they might:

> *"arrange meetings between the school and the family to rebuild their relationship…the TFD serves as a useful baseline for understanding a child's school attendance and thinking about the appropriate intervention needed for the family."*

During our evaluation, we also shadowed cross agency meetings where, though not consistently used, the TFD could provide useful background information to support decision making. We observed the DIRM (Daily Incident Review Meeting), a multiagency meeting involving participants from the police and other agencies. This meeting, led by a Triage practitioner, reviews a list of children identified by the police to determine appropriate triaging decisions. The TFD was occasionally consulted for certain cases, and it proved helpful to access a range of information from different sources. However, case management systems were generally preferred in this type of situation, due to the familiarity of using them and the depth of information held within them compared to the TFD.

The TFD helps some practitioners to plan and monitor their work.

Some team managers and supervisors in Early Intervention described how the TFD could be a useful source of information for workers to develop action plans for the cases they hold, and for continuously monitoring progress on these plans. An Early Intervention manager told us that people in their team "would use the TFD to get background information to start developing their action plan. They'd go on the TFD, examine indicators, define an action plan, and then look at the TFD on an ongoing basis to update the outcome status".

5.2.2 Time-saving

The TFD helps some practitioners save time by bringing information about children and families together into one place

Initially, responses to our survey indicated a mixed picture in terms of whether or not the TFD saves users' time: 38% indicated that it helped them to save time. Within this, 44% of Triage practitioners noted it saved them time spent on tasks. However, we found that those who use it more often are more likely to report benefits in relation to efficiency, with 50% of all regular users (at least once a week) saying that the TFD saves them time. There are various different reasons why the remaining 50% of these practitioners don't use the TFD as often, as well as other reasons why usage doesn't translate into certain benefits such as time saving. These are explored in the 'Limiting Factors' section (Section 5.2.5).

Across different job roles, time savings are realised in various ways. Triage practitioners are the highest users of the TFD. These teams receive and process a large volume of referrals and make triaging decisions, some of which may be based on limited information. As such, they are more likely to use the TFD more frequently than practitioners in other teams. Practitioners told us that the TFD

enables faster information retrieval to confirm key details and prior service involvement as part of the triaging process. Of those who said the TFD does save them time, over half said that it saves them half a day per month or more. Other Triage practitioners report more substantial time savings and were clear about its significance in their day-to-day work:

> *"The TFD tool is essential for me to perform my role effectively. I use it many times a day and it saves me hours in terms of research."*

It is important to note that it is likely that a large majority of the practitioners surveyed were not working for the local authority before the TFD was implemented in 2015. It is, therefore, difficult to ascertain exactly how much time the TFD saves practitioners due to those who are newer to the council having less experience of the manual processes that were in place before the addition of the TFD.

Early Intervention practitioners described how the consolidation of different types of information is a key time saver when planning and developing approaches for different children based on each child's service history. For example, one practitioner told us they used the TFD for basic background checks in preparation for the court disposal panel, which decides on courses of action for children referred by the police. With approximately 10 children referred to the panel each week, they highlighted that using the TFD for gathering background information on these cases is "a lot quicker".

Others working with schools to develop plans for children with safeguarding concerns said they use the TFD "all the time, multiple times a day" to have an overview of a child's vulnerabilities. They described the TFD as "the first route to start digging into a young person's information". Since they oversee multiple cases, the TFD can drive significant time saving, as one practitioner notes; "we're talking minutes saved, but those minutes add up".

Different managers within the Early Intervention team described how it supports management processes, such as allocating cases in their team as referrals come in. As one manager told us:

> *"Mainly use the TFD for triaging cases [to their team] as they come in… I find the TFD quite helpful and useful to save time and have it as a one stop place to find the information"*

Similarly to Triage and Early Intervention teams, Social Care practitioners describe the TFD's usefulness in bringing together information when they are triaging new children or families, as one social worker we spoke with outlines:

> *"I'd use the TFD when receiving new cases or when on duty to get background on new cases."*

Different Social Care practitioners we spoke with recognise the time saving benefit of the TFD in specific instances. For example, being able to access education information that isn't on social care systems was seen as particularly useful, since it can "take ages" to obtain this manually. As one practitioner notes:

> *"I used it for basic information, like what school [the child] attends.. it's definitely a time saver if you can go to one place and find a few bits of information that you need".*

The TFD saves time by helping to identify who else is working with a child or family

In addition to information about children and families specifically, various practitioners describe how it facilitates a quick understanding of other agencies who are working with that family.

According to various practitioners, the TFD provides a "starting point" (Early Intervention practitioner) to understand the child's involvement and identify potential contacts. A Social Care practitioner noted that without the TFD; they "would have to do a lot of phoning around" and that it could be "really hard to even find out where a family's registered with the GP, or even getting in contact with housing".

By empowering workers to swiftly identify the right individuals, the TFD also avoids unnecessary contact on irrelevant cases. An Early Intervention practitioner emphasised this benefit:

> *"You don't go around the houses and therefore you're not asking from other professionals who might not have the information you need. You're not wasting their time either."*

In this sense, time-saving may be a systemic benefit, experienced as a faster flow of information and more efficient working with others. This was noted by many of those who answered our survey, with 47% reporting that the TFD enabled them to work more efficiently with other teams. This figure rises to 57% among those from Early Intervention teams, perhaps unsurprisingly since their work relies heavily on collaborative working with other teams.

By saving practitioners time, the TFD allows workers to enhance their effectiveness in other aspects of their work.

Some workers described how they can use the time they saved using the TFD to focus on other tasks. As a Social Care manager noted;

> *"[The TFD] frees up more time for the social workers to then be able to do important and meaningful aspects of their work that they are trained for."*

Additionally, spending less time retrieving information encourages individuals to explore data they might not have sourced otherwise. As an Early Intervention practitioner describes;

> *"To get the education data is really difficult […] So I'll be honest, probably I wouldn't bother if I did not have the TFD, I'd have less information."*

5.2.3 Service Planning

The Qlik App tool containing information from the TFD has supported leaders to make resourcing decisions

Through our interviews, various staff members have described the value of aggregated trend-level data that is displayed in the Qlik App that displays information from the TFD. On several occasions, the same example was cited whereby the Insight team used the Qlik app to demonstrate an increase in demand for services in South Bristol, associated with a higher number of looked-after children and school exclusions. Working with the Director of Children's Services, this subsequently influenced a re-allocation of funds into this area.

However, we found the limits of the Qlik app as a specific tool for these groups of staff. Since decisions of this nature have potentially far reaching consequences, they require more than may be accessible in a self-serve tool. Having said this, it does seem that TFD data is regularly used as the basis for analysis which supports this type of activity. In this sense, there is evidence to support service planning outcomes.

5.2.4 Other Outcomes

Autonomy and worker motivation

There were some indications that the TFD supported other outcomes among practitioners. For example, it was suggested that, by facilitating direct access to key information, the TFD can empower practitioners with a greater sense of autonomy. This was noted by a Social Care Practitioner who told us:

> *"I value the independence, the autonomy that it gives me that if I need something, I don't need to ask anybody, I can just go in and get it."*

We also found some, but limited, evidence that the TFD could potentially boost motivation by providing visibility of the outcomes of families: 16% of those surveyed felt that the TFD supports their motivation at work. Although this is a minority of users, given this wasn't an intended benefit, as well as the large size of the cohort using the product, it's an additional dimension of the TFD which can't be ignored.

Some suggest the TFD supports less intrusive practice

According to some Triage practitioners, obtaining health information through the TFD feels "less intrusive into somebody's medical data" than using their health system, Connecting Care, which contains more comprehensive information. They perceived this as a "huge benefit" of using the TFD.

Others point to potential risks of having such expansive data access

Some practitioners we interviewed use only a small subset of the information on the TFD that is visible to them, as they didn't feel they need the rest for their roles. They indicated that, although some of the data is likely to be useful in some cases, it may not be needed for all cases or for all members of their team:

> *"I think, not everyone should have access to everything as well... in terms of my team, they don't necessarily need all that information - the case managers do in the other areas.. the team shouldn't have access to someone's mental health data because it's confidential" (Early Intervention Manager)*
>
> *"We shouldn't be taking unnecessary information. It needs to be really specific to the referral... But with the Think Family, all that information's not necessarily required for every referral." (Triage Practitioner)*

5.2.5 Limiting Factors

Whilst it is clear that the TFD delivers significant value for some staff, a recurrent theme from our research was that usage and experience of benefits is a mixed picture. This is the case both across different teams and between individuals in the same team. We surfaced a number of factors which may account for this and that, in turn, limit the TFD's impact.

The TFD 'use case' is stronger for some teams

Usage of the TFD, and the extent to which teams feel it saves them time and has a positive impact on their work, is lower among Social Care and Other Teams compared to Triage and Early Intervention teams. 78% of those in Early Intervention teams we surveyed reported that it has a positive impact on their work, but only 50% of Social Care teams we surveyed felt this way.

Whilst it was noted (above) that Social Care staff may use the TFD when working with a new family for "basic information", such as school attendance, it lacks the type of information to enable a deep understanding of a family's situation which they require. As two practitioners note;

> *"I'd use the TFD when receiving new cases or when on duty to get background on new cases. I would not use it for the case I know, where I would get knowledge based on the relationship."* (Social Care Practitioner)
>
> *"I'll use the other databases rather than TFD because I want to go more in depth. If there's a social worker, I want to know why. I want to know what their last case records were, what discussions they're having."* (Early Intervention Practitioner)

Since the TFD was initially designed to brigade information for Triage and Early Intervention teams, differential usage between these teams and Social Care teams is perhaps to be expected. It should also be said that, to address the more specific needs of Social Care teams, a new product called '*Children and Families View'* has been under development, using data from the TFD.

In a similar way, in spite of the potential use case of the Qlik app for senior managers in terms of strategic and commissioning decisions, the Bristol Insight team acknowledge that these managers are not currently active users of this product. Whilst the information is relevant to their work area, due to the nature of the decisions that are made, more in-depth analysis and reporting is often required that goes beyond what a self-serve tool, such as the Qlik app, can provide. As with Social Care teams, whilst the TFD can support some of the tasks senior managers perform, their actual use of the app is limited.

Training and support is closely linked to usage

Of those who reported that the TFD saved them time, 82% felt they'd received adequate training. However, of those who said the TFD didn't save them time, this figure fell to 43%. An almost identical pattern was evident when we asked whether people felt TFD impacts their work positively, with only 28% of those who didn't feel the TFD impacts their work positively reporting that they had received adequate training.

This sentiment was supported by qualitative feedback we gathered, as one comment from a Triage practitioner shows:

> *"I've been told to use it, but have received no training. I'm frantically busy the whole time and cannot spare the time to work out how to use it."*

Our questions around training didn't explore what 'adequate' meant for each person, therefore training requirements may be different in each case. Since some we spoke to find the TFD "self-explanatory" to use, differing levels of skill, confidence and experience in relation to digital products may be an issue, which may contribute to differential usage. This point wasn't missed by an Early Intervention manager we spoke to;

> *"Some in the team would proactively use the vulnerability timeline intuitively, some would not know that. People can be excited by data, or terrified by it – we've got both."*

Awareness of the TFD varies between practitioners

During our visit to Bristol, we also found different levels of awareness of the TFD. 6 members of a Social Care team we spoke to were unaware of it, whilst one in this group had recently heard about it from a colleague in another team and recognised its potential usefulness. The Insight Bristol team acknowledge that significantly more time has been spent with Triage and Early Intervention teams to promote the TFD and embed it in their team processes. Indeed, there was a high level of awareness among the Early Intervention teams we met. However, one from this group reflected that they "should probably use it more". A practitioner from an 'Other Team that used the tool reflected similarly that "other teams don't use the database as well as what they could do".

Aside from actual skills development, we found that training served as an important means of communicating with teams about the TFD. As two different Early Intervention practitioners make clear:

> *"They used to use the TFD more and they used it less as it dropped off their radar, but have used more again since they received training one year ago."*
>
> *"I didn't even realise it was a thing. I didn't even realise it was something we had until like the training came up. "*

This also applies to usage of different functionality within the TFD, again we found a relationship to training:

> *"I found it very useful to have the training, [to] see how it can be used – there are some functionalities they would not have discovered otherwise."(Early Intervention)*

Knowing about certain functionality would have been particularly useful in some instances. For example, an Early Intervention practitioner we met said they would ideally like to see the names of professionals working with children, a feature already included in the TFD.

This point is also supported by usage data (Fig. 11, below), which shows far greater usage of pages that reference more basic person details, than pages containing more complex views, such as the vulnerability timeline.

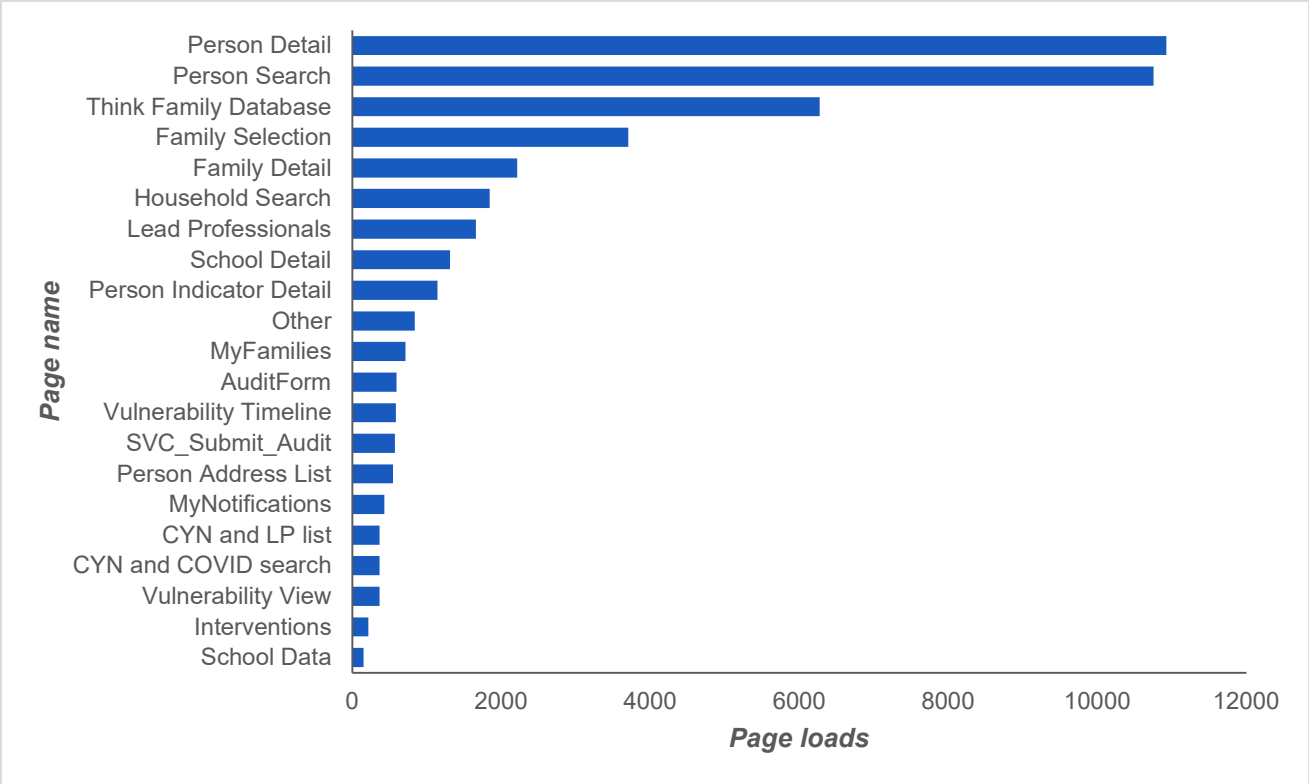

Figure 11: Total clicks on different pages within the TFD in 2023

Thus, whether awareness can be addressed by training or some other form of communication, there is an opportunity to increase engagement and in turn, the potential benefit of the tool.

Some practitioners use other systems instead of the TFD

While the TFD allows streamlined access to various data sources, some workers can access some of this information through their case management systems (CMS) and other individual source systems. With the availability of different options, practitioners described how usage of systems then becomes a question of personal preferences or habit, which, for some, will mean opting away from the TFD:

> *"I don't use TFD much, maybe a couple of times per year, I'm used to using LCS [Liquid Logic Children's System] and the Care and Eyes system" (Triage practitioner)*

> *"It's probably part of me not looking at it more, as it's not in the forefront of my mind. You get in the habit of looking at certain things." (Early Intervention practitioner)*

Some workers find navigating to the TFD, a separate system from their day-to-day CMS, cumbersome, especially when they still need to access other systems for additional data points. As an Early Intervention practitioner notes:

> *"The heart for me, why I don't use the TFD as much as I could, is the multiple systems thing"*

This is particularly a barrier in time sensitive situations, such as during multiagency meetings. In our observation of a Triage multiagency meeting, the chair sometimes used the TFD but relied mainly on their case management system:

> *"If I'm honest I don't use the TFD very much, maybe because we're more familiar with LCS, having to also look on TFD in the [team meeting] … is a bit overwhelming."*

In the context of the availability of different systems, one practitioner discussed how which tools are used becomes dependent on personal preference or habit. As one Triage practitioner describes:

> *"It's probably part of me not looking at it more, as it's not in the forefront of my mind. You get in the habit of looking at certain things."*

External events have 'spooked' some practitioners

A visit by staff from Ofsted took place in 2023, who repeatedly asked managers and practitioners whether consent had been sought for sharing information. Many of these staff were both unable to answer this question and unclear on Bristol City Council's position around using public task (using relevant legislation, see Appendix 5 for a full list) to justify data sharing. As such, these staff were concerned that by using the TFD they would be falling foul of UK GDPR legislation. As part of our research, we heard from Insight Bristol staff that practitioners from these teams now accept that this was an erroneous assumption. However at the time, this event damaged trust and motivation to use the TFD, which is still in the process of being rebuilt, as outlined by practitioners we spoke to, and demonstrated in Figure 12.

> *"That broke the trust level [of staff with the TFD] and created confusion so that people were unsure what they were allowed to do" (Triage practitioner)*

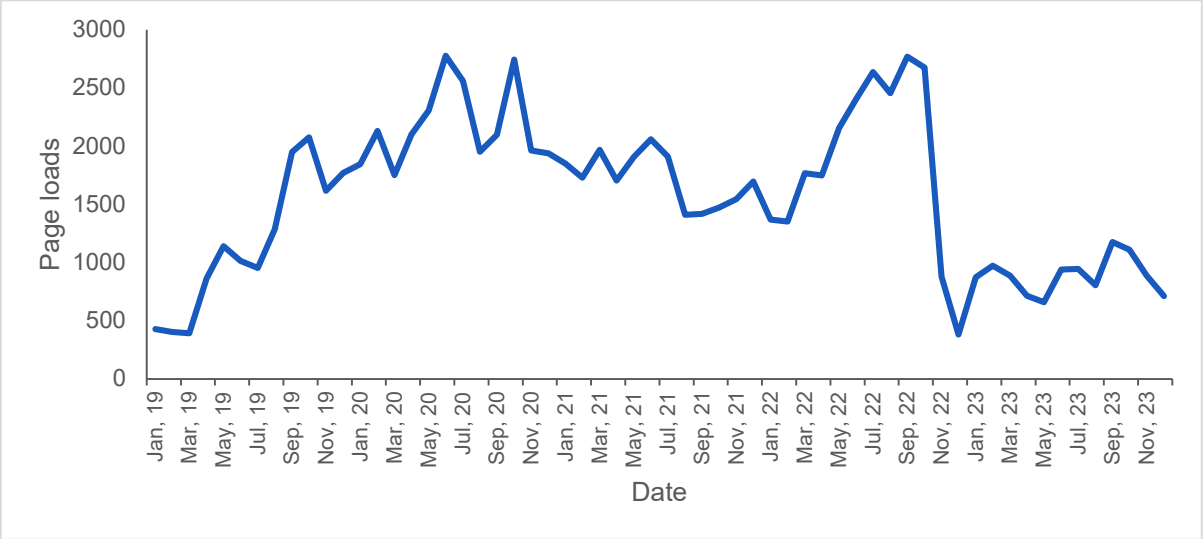

Figure 12: Monthly page loads of the triage team between Jan' 19 and Dec'23

Data quality is perceived as an issue for some

On the whole, data on the TFD is seen as accurate: 80% of survey respondents said that the TFD data is mostly or quite accurate. In the majority of cases where people do feel TFD is inaccurate, discrepancies in information pertaining to the contact details of practitioners in other organisations or teams are cited. In this instance, it should be said that it is the underlying data which is inaccurate, rather than a fault with the TFD itself. However, we still found some evidence of *perceptions* of the TFD containing inaccurate data, although for the large majority of those we spoke to, this wasn't their perception.

Others we spoke to point to instances where the TFD has given inaccurate information resulting from its matching processes, which in some cases has impacted outcomes with families. For example, a TFD matching error meant that an incorrect NHS number was supplied in relation to a child attending hospital, and subsequent treatment couldn't be given in hospital. However, examples of this type were not commonplace in the course of our research.

5.3 Think Family Education (TFE)

It was apparent from interviews and survey response data the extent to which school staff value the TFE. Indeed, some of those we interviewed and surveyed were concerned that the TFE may be decommissioned, and as result underlined the need to retain it. We found that school staff have felt 'out of the loop' in terms of information sharing and that they are often informed some time after significant events happen in the lives of their students. It's felt that the TFD has been key in addressing this. In the words of two different school practitioners:

> *"I felt that there was a massive disconnect between social care service and education. And this [has] bridged that gap a little bit."*

> *"I've always found that education has always been the poor relative of the team around the child. We've never been party to the information that's on Think Family. So when it came out, it's like, thank God!"*

Like the TFD, at a general level the large majority of those who we surveyed (85%) agreed or strongly agreed that the TFE impacts their work positively. Below, we explore some of the reasons why this is the case in more detail.

5.3.1 Effectiveness

The TFE helps school staff to identify and monitor children who need support

Many staff described how access to information in the TFE "helps identify social care cases and level of need" (Vice-principal, Primary), which is useful in various situations. Firstly, this information supports school staff to identify children with support needs when they start or move schools, when there is a limited understanding of their circumstances. Although communication processes between different schools and agencies exist, when these falter, the TFE can highlight instances of child vulnerability. As one Headteacher explains:

> *"It has enabled us to see children that we had not been made aware about through other communications." (Head, Primary)*

Additionally, the TFE also supports school staff with identifying changes in support needs of existing students, as one Designated Safeguarding Lead explains:

> *"It updates me on children's changing situations, and gives me a contact for a lead professional so I can follow up" (Designated Safeguarding Lead (DSL), Secondary)*

As well as identification, the TFE supports "effective monitoring of children and families" (Inclusion Lead / DSL, Primary) in terms of understanding risk. This is of particular benefit given the reported time delay of safeguarding notifications that are made to schools independently of the TFE. As one Pastoral Lead makes clear:

> *"Communication is often not very good and being able to access the app to confirm status of cases is invaluable." (Pastoral Lead, Primary)*

However, the TFE doesn't seem to replace existing measures and processes in this respect, but is more "another avenue of information to keep up to date with family needs" (DSL and Attendance Manager, Primary School). In this way, staff use it to cross-check and complement information that is already available to them.

By giving a more complete picture of a child, the TFE helps schools staff to offer more appropriate support

Many respondents across our research described how the TFE “helps with creating a contextual picture around… children and their families” that aids understanding of the circumstances and the specific needs of children. In the context of SEND schooling, this was seen by one respondent as particularly useful, since children can be taxied in from various parts of the city and teachers don’t get the ‘playground’ time to gather additional information. As one Headteacher outlines:

> *“I've been struggling for years to gain information on our students and services working with them and their families. The information on chronologies is invaluable in ensuring we have a much more comprehensive picture of our vulnerable children.” (Headteacher, SEND)*

The TFE enables staff to get "a more rounded perspective on support needed" (DSL, Primary), before children start at school. It was felt that this plays an important part in planning, so that children have appropriate support that is more likely to meet their needs:

> *“We've got much more informed, like it informs our practice with that child before they started with us.” (Head of School/DSL, SEND)*

Support that such information can prompt can range from a ‘universal offer’, where a family is open to the Early Intervention team, as well as an array of other interventions:

> *“It could be something simple like providing food, clothing, those sort of charity applications.. mental health.. domestic abuse.. Yeah, so a whole range, lots of parenting issues… it’s making sure those families are support[ed] and they’re accessing the services they need to”* (Safeguarding Lead, Secondary)

Having access to a range of information on children was seen by one Deputy Head as particularly relevant during the transition from primary to secondary schooling:

> *“[The TFE] provides info we are not always aware of - it has been critical in transition from primary, it includes a lot of info that has not been shared and gives us awareness of interventions implemented and advises key professionals involved” (Secondary)*

Since the TFE also provides responsive information, some school staff describe how it “can help decide actually what needs to happen next” (Family Support Lead and Safeguarding Lead, Primary), as children’s needs change or become known to the school, making responses “much more targeted”. As different school staff describe:

> *“Something new happens then the child gets… a marker so it can just check in and [they] might have just qualified for free school meals. So, we know that there's a financial implication for that household and then …signpost them to things like, oh did you know we have a food bank on a Monday?” (Pastoral Lead, Secondary)*

> *"It also alerts us to pupils that have been involved in incidents or at risk of homelessness etc. so we can provide support not by divulging any confidential information but by assessing current provision and adding suitable interventions." (Assistant Head, Secondary)*

Similarly, others describe how additional context can help with responding to behavioural issues as they arise;

> *"I can monitor the children that may have had a tricky time and support as necessary." (Family Support DDSL, Primary)*

The TFE enables schools to make faster decisions and provide more timely support

Having access to comprehensive information faster, in turn enables faster decisions to be made in schools, which may have important implications in terms of outcomes. As different school staff describe:

> *"We can provide a bit of support a bit earlier. Like…if we're not waiting three or four weeks for a phone call about something, then actually we can get in in that moment." (Family Support Lead and Safeguarding Lead, Primary)*
>
> *"The Think Family App has assisted us in providing timely interventions which will have an impact on child and family outcomes so we can proactively support families who are most in need at the time they need it and not 6 months to 1 year down the line which is when we have been finding out some of our children's changes." (Deputy DSL and Pastoral Support Worker, Primary)*
>
> *It has an impact in terms of response and our speed to be able to identify families… so it just means we can be more responsive in the moment. (Family support and Safeguarding lead, Primary)*

Various school staff highlight that the speeding up of safeguarding notifications from Police that the TFE has facilitated, has been particularly valuable. One described how this has fed through into their risk assessment processes:

> *"We can target our response much more like acutely… we basically RAG rate most our children.. So if he was absent, we'd do a home visit straight away. Cos he's one of our red rated students" (Pastoral Lead, SEND)*

5.3.2 Time-saving

The TFE saves some school staff time by enabling faster sharing of information.

As with the TFD, it's a somewhat mixed picture in terms of whether the TFE saves school staff time. Overall, 54% of all respondents to our TFE survey confirmed that the product does save them time.

However, those who use the TFE more often are more likely to report time savings: 69% of those who use it more than once a week report it helps them save time, which rises to 77% of daily users.

The amount of time saved is also mixed: across all users who report time savings, 19% estimate that it saves them half a day or more per month, whilst 59% saying it has saved them between 30mins and 2 hours per month.

For those that do experience this benefit, we found that it was realised in different ways. Firstly, the TFE consolidates information about a child in one place, thereby eliminating the need to chase information manually. Before the introduction of the TFE, schools had to depend on their connections with social workers to gather information about a child's engagement with social care. This process was time-consuming and involved a lot of "leg work of contact… and making a referral [and] not hearing back" (Head of School/DSL, SEND). Use of the TFE has meant school staff can directly access data about children in their school, which for some has made "information sharing much quicker" (Deputy Head, Primary). In the words of one staff member:

> *"We'd have a direct access to someone that… could check the database... It's meant that we don't have to do that. Now we've got access to the information. Which is good." (Head of School/DSL, SEND).*

In some cases, school staff need to liaise with other agencies and the TFE is also good at identifying lead workers so school staff can "go straight to the professionals involved" (Deputy DSL, Secondary). Again, this has made such liaison more efficient. As one DSL describes:

> *"It has…helped me track down a child's named professional very easily, which has saved me a huge amount of time." (Primary School)*

As well as helping to identify other professionals for information gathering, the TFE is useful in avoiding "time spent making referrals and chasing when the right agencies were already aware".

School staff also suggested the TFE would be able to help them to perform admin tasks, such as reporting and audits, which have been onerous in the past. As one Deputy Head (Primary) explains:

> *"Every year, the school is asked to do a safeguarding audit.. a massive document that asks you loads of questions [and] some of the questions are very specific… That used to be quite difficult just using our own online monitoring system. Now that's going to be much easier."*

It seems that time saving as a benefit differs significantly depending on the type of school: 47% of primary school users report that the TFE saves them time, however this increases to 79% for those working in secondary schools. Moreover, only 15% of staff in primary schools who save time using the TFE estimate this to be half a day or more per month, whereas this rises to 27% for the same group in secondary schools. Such evidence suggests that the TFE represents a stronger use case within a secondary school environment. This may be due to the greater number of students in secondary schools compared to primaries, making aggregated data more valuable.

The TFE saves council staff time who are connected to schools.

We found that by eliminating the need for schools to contact the council for basic information, some council teams who work with schools also save time. This was noted by an Early Intervention practitioner working with schools, who described how the TFE saves their team time by reducing the need to respond to school requests.

However, in one instance a challenge around cross-team communication arose when Early Intervention workers were unaware that their contact details were displayed in the TFE, which led to friction between them and schools. As an Education Intervention Manager describes:

> *"Schools might have details of an allocated [Early Intervention] worker almost immediately and that [Early Intervention] worker might be a little bit on the back foot when schools had lots of information"*

5.3.3 Service planning

The TFE is used to understand the "whole school picture"

On the whole, the feedback we received related to benefits for individual practitioners or teachers. This may well reflect our sample or the perceived focus of our research on the part of respondents. However, there was evidence that the TFE enables a broader understanding of needs across a school:

> *"I've been struggling for years to gain information on our students and services working with them and their families. The information on chronologies is invaluable in ensuring we have a much more comprehensive picture of our vulnerable children." (Head, SEND)*
>
> *"It allows me to access information quickly and see an overview of the whole school picture." (Head, Primary)*
>
> *"The TFE has been essential in ensuring we have a complete picture of our student cohort" (Head, Special School)*

We also found that such insight, aside from providing assurance, is instructive as part of measures to manage and "keep on top of" safeguarding issues. For example, the TFE was mentioned as a feature of weekly safeguarding round-up meetings, as well as other planning meetings. In this way, compared to the strategic Qlik app, we found more evidence that the TFE is used as a standalone tool to provide leaders with information for service planning decisions.

5.3.4. Limiting factors

Perception of data quality issues may be impeding benefits

When given the opportunity, many of those we surveyed mentioned at least one of a range of data quality issues which may detract from the benefits conferred by the TFE.

Of all those surveyed, 23% mentioned data accuracy as an issue, potentially compromising an ability to understand children's needs. Records being incomplete or containing incorrect information, for example, where students are missing on the TFE, were cited often.

Many of those we spoke to suggested that data quality issues lay more in TFE data being "often out of date and cases closed long before the app is updated" (DDSL, Primary). When prompted, 26% of all survey respondents mentioned data not being updated fast enough as an issue, which potentially contributes to the 39% of respondents who felt the TFE didn't save them time. In the words of one Headteacher/DSL;

> *"A lot of time has been spent trying to contact key people listed on the app e.g. social workers, who don't have any involvement with the children listed." (Primary)*

Some, such as a Deputy DSL & Pastoral Support Worker we surveyed, suggested that such problems relate to a number of different data points;

> *"In recent times we have not been updated swiftly enough to family changes of circumstances such as domestic incidents, allocation of new professionals, of changes in child protection status." (Primary)*

Having said this, responses to our survey also show that 75% of users feel that information is mostly or completely accurate. Also, some accept the inevitable nature of discrepancies around Child in Need (CIN) data, given the "the rapid nature of the changes to professionals working with the children" (Head, Primary) and qualify that these errors are "occasional" (DSL, Primary). Where they do occur, others explain they are "easily solved by a little communication". (Deputy DSL & Pastoral Support Worker, Primary). Similarly, a DDSL we contacted accepts that whilst data quality issues exist, the TFE still fulfills its intended purpose:

> *"The information shown on the TFE is sufficient enough to make sure children are safeguarded." (Secondary)*

A small number discussed platform and usability issues

A very small number of those we spoke to highlighted issues with the usability of the platform. One Headteacher surveyed criticised the usability of the platform:

> *"The application seems to be temperamental. For a while I lost access, now every time I click on something I have to sign back in, it takes a long time to navigate through the pages when needing to sign in each time" (Head, Primary)*

Another found the speed of the TFE app problematic:

> *"It's useful but can sometimes be slow to be updated and has been complicated to log in for some" (Behaviour and Pastoral Lead, Primary)*

As with the TFD, usage and experience of benefits is related to training

Whilst it is unclear how many people have such complaints and the extent to which this affects usage, 35% of those surveyed reported that they did not feel they had received adequate training to navigate the TFE, beyond the short online video that is mandatory. Furthermore, 94% of those who feel they have received adequate training report the TFE having a positive impact on their work. Whereas, this figure drops to 68% among those who don't feel as though they've received adequate training. This reflects a similar issue to that found with the TFD; whilst many find it easy to use, others who are less digitally capable may struggle. This suggests a training need to ensure more widespread and effective use of the tool.

This training need could be met, at least in part, by bringing school practitioners together as part of communities of practice to offer mutual support, which would be welcome based on the feedback from one headteacher we spoke to:

> *It would be great to hear from other schools… how they are using the data" (Primary)*

5.4 Targeted Risk Models

As mentioned earlier in this report, since we started this evaluation, the CCE / CSE models have been discontinued, owing to judgements around their accuracy. The Bristol Insight team have also received news of new funding to rebuild the existing NEET model. In this sense, our evaluation focuses on products that are either no longer live or will change significantly in the near future. In spite of this, our evaluation still has value in terms of surfacing lessons about how risk models can be developed in the outcome areas we have defined. This may be especially useful for Bristol, who have regarded these models as "experiments" to be learned from.

Our findings around the targeted risk models below, suggest they were perhaps the weakest element of the TFD in terms of enhancing services and driving outcomes for children and families. However, we think it is important to note that they were conceived and developed to address an information gap that continues to be a challenge. As a member of the data team in the Somerset and Avon Police notes:

> *[Criminal and sexual exploitation crime] does not present in high volume to the police and it remains a hugely hidden crime that continues to be difficult to identify , prevent and manage. There is a lack of intelligence and data generally.*

In this sense, although our research does show issues around their accuracy and potential to drive efficiencies they do represent an important innovation as part of an aspiration to make improvements in a complex area.

5.4.1 Effectiveness

A lack of accuracy of the CCE / CSE models has undermined their ability to enhance services

Many practitioners we were in contact with alluded to the inaccuracies of the CCE / CSE models mentioned above, in terms of identifying 'at risk' children. Examples were given where they felt children should have been identified as vulnerable but were not listed. As two different Early Intervention practitioners explain:

> *"The list of young people who are identified doesn't really line up with what we know when we speak about these children on a weekly basis."*
>
> *"I think we get lots of children where there aren't so much concern for, and sometimes we have children that we are really, really worried about that just don't come up on the Qlik app."*

In many instances, we found that practitioners had stopped using these models prior to them being discontinued recently. Such evidence is quite damning in terms of the ability of these models to support practitioners to better identify risk and target support accordingly:

> *"I don't feel it's fit for purpose until we've sorted out all those bits" (Early Intervention Manager)*

It was acknowledged that they were more accurate in the past. As a Senior Manager in Children Services explains, one of the benefits of the CCE and CSE models was that they provided a means by which to understand new or emerging problems, that weren't properly understood:

> *"They were helpful at the beginning when stepping into neglected areas or identifying a type of harm that hasn't been recognised. They can be used for a time-limited period to define and identify the initial cohort… I think it's super helpful cause it gives you a starting point to do that defensible analysis."*

However, it was made clear that subsequent changes to how these models were built, including their exclusive use of Police data and not data that relates to other risk factors, has led to inaccuracies. Prior to this point, there was recognition that the risk models were accurate and used meaningfully by Early Intervention teams. The Insight Bristol team acknowledge that changes to the CCE and CSE models have led to their outputs being unusable and discontinuing them was their only option:

> *"We just couldn't give our [Early Intervention teams] a list of people that they were confident in"*

In this sense, although much of the feedback we received alluded to how problematic these models had become, earlier success suggests that there may be an opportunity for models like CCE and CSE to support practice. However, this is highly dependent on accuracy of their outputs and the extent to which practitioners are sufficiently supported to understand how to use them (outlined below).

The NEET model supports identification of at risk young people but could be used more

We heard from practitioners that they regarded the NEET model as more accurate than the exploitation models, with different reasons cited for this:

> *"There seems to be more accuracy just because the lead in time is better and therefore the data that it's relying on to predict whether their need is more accurate." (Early Intervention practitioner)*
>
> *The NEET modelling is perhaps more effective because it's kind of a fixed experience for a child" (Senior Manager in Children Services)*

As such, more positivity was voiced in respect of the NEET model amongst the schools staff and council practitioners we spoke to and surveyed, than was heard from practitioners in the council around the exploitation models:

> *"Great to see which young people are presenting with risk of NEET factors" (Secondary School)*

While practitioners confirm that the NEET model is not "informative" in terms of giving a richness of information that other elements of the TFE give, its value lies in identifying at risk students that may not otherwise come to light:

> *"Really useful for those kids that are flying under the radar in terms of behaviours…they're not the kids that you're keeping an eye on to have that knowledge around" (Primary School practitioner)*

We also found that, for some, whilst not using the NEET model itself for identification purposes, it's used as an additional tool to support or substantiate other processes within schools for identifying vulnerability:

> *"It's incredibly useful to make sure that our model is matching the information that is held within the TFE" (Secondary School practitioner)*

In terms of use in practice, those we spoke to described how identification of students who are potentially at risk can then support further inquiry with a family. As a Social Care manager notes:

> *"The NEET indicator again is quite helpful… it kind of leads on to conversations with the families or discussions of their education."*

Having said this, of the 85% of respondents who noted that the TFE (which includes the NEET model) had a positive impact on their work, only one respondent mentioned the NEET model when prompted to qualify why it had a positive impact. This may be explained by its lack of use by school

staff, with 24% of survey respondents indicating they use the NEET model, 50% not using it, and 26% of respondent saying they haven't heard of it. As with the TFE more generally, many of those working in primary schools noted that it didn't feel relevant for them:

> *"I feel like potentially the [NEET model] would probably come in more to play like secondary education because there's a lot of school refusal*." (Primary School practitioner)

This was similarly the case for those working in SEND settings, who said that higher staff to student ratios enabled a better understanding of needs across the student population, which meant that such a tool was less needed. In the words of one Headteacher from a SEND school:

> *"They know if something's up the second the kids are in the building, so I'm really confident that they're all around it."*

Indeed, excluding primary and SEND schools, usage of the NEET model does increase to 55%. However, this still points to an issue of usage within schools. Some interview respondents conceded that poor usage was due to time and resource constraints, in terms of not having the capacity "to get them up and running". Survey responses also indicate some concern over the model's accuracy and that a lack of awareness and understanding of how the NEET model is used may account for low usage. Addressing this could well increase the impact of this model.

A lack of information about the models may also have affected their usage

Some practitioners said they lack an understanding of what risk scores mean across the different models. In some instances, they reported that, as they didn't know why a young person, for example, had been flagged as potentially vulnerable, it was difficult to think about what support would be needed. As two different practitioners make clear in reference to the CCE and CSE models:

> *We're getting young people that are being flagged and we are not really understanding why even with that little description, which often is not very helpful"* (Early Intervention Practitioner)
>
> *"Personally, I feel uncomfortable using it to guide our work because of the lack of transparency on where the numbers come from and how it was developed."* (Early Intervention Practitioner)

For some practitioners this lack of information was enough to discourage their use of the risk models entirely:

> *"'Does that mean it's quantified somehow, or is it just indicating that the risk is present? I don't know what I'm looking at; that's why I don't use it." (Social Care Practitioner)*

Such gaps in knowledge clearly present an issue in terms of the risk models enabling more effective practice. More broadly, it poses the potential issue of practitioners continuing to use the risk models to inform decision-making and still not being clear on what the outputs mean or how they are

derived. During our observation, however, it should be noted that the practitioners we spoke to described how the TFD and the risk models supported their decision making, rather than directing it. Indeed, many noted that, as it became clear the risk models were inaccurate, they decided to stop using them.

5.4.2 Time-saving

There is evidence of inaccuracies leading to time wastage

Staff members who were engaged in the process of crafting these models emphasized that their primary objective wasn't geared towards facilitating time-saving measures for practitioners. Nonetheless, it became apparent that the subsequent iterations of the CCE and CSE models, which created inaccuracies, inadvertently increased the amount of time needed to use them. Specifically, manually checking the model outputs that turned out to be false:

> *"We spend a lot of time because we don't want to assume there's an error and just dismiss talking about that young person." (Early Intervention Practitioner)*
>
> *"I used to spend a lot of time methodically going through the 30 names, emailing people, and checking all the details, but it took up so much of my time that I kind of stopped doing that." (Early Intervention Practitioner)*

We didn't find a similar pattern with use of the NEET model. However, whilst it would be logical to assume that stratified data on risk might lead to time-saving, we were unable to find examples of school staff teams using the NEET in a proactive way that might enable these efficiencies.

5.4.3 Service planning

There was some evidence of examples where risk models could be useful in supporting service planning, but this has become less prominent

Through our conversations with practitioners, we heard of some examples where risk models could be useful in supporting service planning. Cohorts who were identified at risk were routinely aggregated, allowing for analysis at a locality, ward or school level, which informed decision making around resource allocation and redistribution:

> *"Where I found it more helpful is to use it at that kind of commissioning and strategic level where we think about children at a population level to understand vulnerability and harm over a population and a group or a school or an area to target resources… that risk modelling is much more nuanced."* (Senior Manager within Children's Services)

We also heard of one example where an aggregation of the CCE model was used to support the Police's decisions about which schools to allocate officers to.

However, as with the wider use of the models, as there has been a reduced perception of their effectiveness, we heard few recent examples of them supporting service planning. Though this use case still remains a possibility for some.

5.4.4 Other Outcomes

How the CCE / CSE models were developed may have led to unintended practice

A Senior Manager in Children's Services highlighted that the forms of harm that the CCE and CSE models concern are often not clearly defined, meaning predicting them based on a child's vulnerabilities can lead to other issues being overlooked:

> *"Sexual exploitation is a form of sexual abuse and yet the model is not based around sexual abuse in the sense of, it's based around the behaviours that we think are linked to sexual abuse. But those behaviours are also linked to a whole wide range of other vulnerabilities as well. So there's a fundamental issue with trying to use this modelling for types of harm which are not clearly defined."*

They suggested a more appropriate approach could involve presenting general vulnerabilities or indicators, but without directly linking these to vulnerability to specific forms of harm; which might potentially enable a more comprehensive understanding of a child's circumstances:

> *"We're better [off] just talking about more general vulnerability scoring rather than actually having a kind of thematic lens…an overview of like all the vulnerability of a child, but not saying like, is that risk of like sexual exploitation or criminal exploitation."*

Other practitioners questioned the use of the NEET model from a similar position. In particular, concerns were raised around the lack of evidence and understanding about how predictive models should be used to create positive interventions for children. Therefore, accessing this data could potentially lead to unintended negative consequences for children's outcomes:

> *"I guess one of the concerns is…do people start responding to those children in a different way that makes them more vulnerable to exploitation? That's one of the kind of ethical questions, right? It's like if you say you are a child who's likely to be exploited, do they then have interventions which make it more, make them more vulnerable to exploitation?" (Senior Manager, Children's Services)*

In particular, some practitioners working with schools raised concerns about how schools might interpret risk scores:

> *"I worry about where it gets shared more widely. Are they able to see it for what it is or are they going to use that data to further their preconceptions? I think the feedback from schools is they find it helpful. But our practice framework is we're systemic – multiple hypotheses, exploring,*

> *questioning. My experience with schools is they're not really like that." (Early Intervention Practitioner)*

Concerns around sharing predictive data were also highlighted

Based on our interviews, we discovered that, although all council staff with access to the TFD also had access to the CCE and CSE predictive risk scores, these were not developed for, or actively used outside, certain Early Intervention teams. This suggests that this information might be shared with individuals who do not necessarily use or (as noted above) understand this information. As one Youth Justice practitioner ('Other' team outside of Childrens Services) outlines:

> *"I vaguely remember we talked about it in a team meeting a long, long, long time ago and about these models and how, it would work. I haven't used it myself and I think it was used for when we first had a [specific Early Intervention team] looking at exploitation. We're not a re-assist service that can work with anyone. So it's kind of less relevant in a way because our cohort is our cohort and we don't have any choice."*

Furthermore, some practitioners felt uncomfortable about this level of access to risk scoring information:

> *"The ethical questions need to be covered. I don't know how. It's lots of people – it's a big organisation – can just press a button and see all this information about people."* (Early Intervention Practitioner)

Similarly to the TFD, whilst we found no evidence of harm being caused, instances where practitioners have access to data that goes beyond the scope of their roles potentially represents an unmanaged risk.

It is worth noting at this point, that this evaluation contains an assessment Bristol's approach to Information Governance (p.68). In this, we make clear that we don't feel as though there is an data access control issue that mean principles of GDPR haven't been applied in a robust way, but that there may be scope to take a more specific approach to the application of these principles, for example, by understanding data requirements on a team-by-team basis.

Some practitioners also raised concerns about potential biases embedded in the CCE and CSE predictive models

Practitioners highlighted that since the exploitation models were reliant on existing Police data, biases embedded within this are expressed in the model outputs. For example, an Early Intervention practitioner pointed out that predictions from the CCE and CSE models tended to under-represent girls compared to boys:

> *"We know there's young girls that get criminally exploited, but they don't come up, we don't talk about them cause they don't fit. On Qlik it'd generate like 50 names of mostly boys"*

In this case, the model is unable to address issues within the underlying data containing certain biases. A Senior Manager in Children Services reflected:

> *"The fact that children from certain groups are more likely to be reported missing means they're more likely to have a higher vulnerability score bias around kind of policing activity and outcomes are hard coded in."*

Since the CCE and CSE models have been decommissioned, this represents an important lesson to bear in mind when developing their replacement. Such considerations may also be valuable when thinking about the next iteration of the NEET model. Although it was felt by practitioners and the Insight Bristol team that this model contains less embedded bias, since it makes use of a much wider range of datasets and sources.

5.5 Cost-benefit Analysis

To develop a better understanding of the value of the TFD and associated products in monetary terms, we carried out a cost-benefit analysis (CAB). The scope of this analysis concerns all costs and activity in relation to the development and maintenance of the TFD and TFE since the former's inception in 2015 to 2023. We also considered perceived benefits in relation to time-saved in this timeframe as a result of using these products within Bristol City Council and schools that use the TFE.

For benefits, the CBA exclusively considers time saved on tasks attributable to TFD or TFE. Effectiveness benefits, which based on qualitative research are the main benefits, could not be accounted for due to challenges in obtaining outcome data and the unreliability of attributing such benefits to the TFD / TFE. We opted to concentrate on efficiency for a more robust calculation, acknowledging it represents only a portion of the overall benefits.

Valuation method

The TFD and TFE surveys, and interviews with practitioners in Bristol, asked about time saved as a result of using these tools. We calculated an average time saved per user based on the answers received. This was then multiplied by the number of active users to determine the total hours saved. We then derived a monetary value of this by approximating hourly costs of different users using Bristol City Council operational salary bandings and other public pay scales. In turn, we totalled costs since the TFD's development, including team support and maintenance costs. Cost and benefits in different years were adjusted to 2023 values using the Green Book social time preference rate (STPR) of 3.5%, and an inflation deflator.

To arrive at a final cost-benefit figure, we modelled various scenarios to address uncertainty in our estimation of time saved. We present the base scenario here and include additional scenarios in Appendix 9.

Caveats

There are a number of constraints on our analysis, which we advise are kept in mind when considering our findings. Firstly, how we derived our understanding of hours saved is limited by the current staff members' understanding of what work life was like prior to the TFD being implemented. As was intimated by the Insight Bristol team, developing any external data about a child or family was an almost completely manual process. Current perceptions, therefore, may have significantly underestimated actual time spent. In addition, we applied time saved figures based on perceptions in 2023 to historical usage data, which may be unreliable since perceptions in the past of time saved may well differ to the current day. However, in the absence of baseline information, it was the most robust dataset we were able to develop to inform our analysis.

Also, our approach only focusses on value in terms of the time that the TFD saves practitioners and managers, and the TFE saves school staff. As noted earlier, we chose not to focus on potentially valuable benefits resulting from data provided by the TFD enabling positive outcomes for children and families. However, we did hear evidence of this. For example, an Insight Bristol member described how the TFD could evidence reduced police involvement with children in care, due to the matching of Police and Social Care data. The result of this insight meant the Reunification team (as part of Social Care) could move children back to the familial home from care placements earlier than they would have been able to without this information. We assume there are other instances of similar longer term outcomes occurring, but practitioners found such examples difficult to identify, and processes to capture these on an ongoing basis were not in place. As such, we were unable to include estimations of value of this type as part of our cost-benefit analysis.

Much of the value of the TFD may always remain hidden, in terms of avoiding child risk and vulnerability that is difficult to discern even on a qualitative level. This range of different benefits is therefore not included in our calculations.

Finally, our calculations focus on cost of an hour of work as a proxy for financial value. However, in reality, the hours saved do not necessarily translate to fewer full-time equivalents (FTE) or direct bankable cost savings.

Interpretation

Focusing solely on time saved, a proxy of the monetary benefit generated by the TFD/TFE is £1.9 million in benefits since its inception, covering 130% of the £1.5m costs. As only a portion of the benefits have been accounted for, this might suggest that the TFD / TFE may be enabling even greater efficiency benefits. However, given the above caveats, such a conclusion should be viewed with caution. To best assess the cost efficiency benefits of such a tool, further evaluation would benefit from baseline data and the inclusion of monetised service users outcomes, which would require ongoing measurement. For more details on the methodology underlying the CBA, please refer to Appendix 9.

Cost summary

Years	2015	2016	2017	2018	2019	2020	2021*	2022	2023	Total
Total initial development	£180,759	£0	£39,284	£20,074	£0	£26,326	£72,028	£8,470	£0	**£346,941**
Total maintenance	£24,135	£24,135	£24,135	£24,135	£24,135	£24,135	£34,390	£34,390	£34,390	**£247,979**
Total ongoing development	£48,405	£48,405	£48,405	£48,405	£53,405	£48,405	£63,660	£58,660	£63,660	**£481,406**
Total cost	£253,298	£72,539	£111,823	£92,613	£77,539	£98,865	£170,077	£101,519	£98,049	**£1,076,326**
Total costs – inflation and time adjusted	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**

*Development of the TFE in 2021 driving initial development cost that year

Figure 13: Cost Summary

Benefits summary (base scenario)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total hours saved TFD	547	2,029	3,852	5,357	11,165	11,207	10,828	12,972	10,372	**68,329**
Total £ saved TFD	£13,222	£49,030	£93,102	£129,461	£269,828	£270,846	£261,680	£313,503	£250,672	**£1,651,342**
Total hours saved TFE	0	0	0	0	0	0	0	0	4,497	**4,497**
Total £ saved TFE	£0	£0	£0	£0	£0	£0	£0	£0	£158,566	**£158,566**
Total FTE saved	0.3	1.1	2.2	3.0	6.3	6.3	6.1	7.3	8.3	**40.9**
Total £ saved TFD & TFE	£13,222	£49,030	£93,102	£129,461	£269,828	£270,846	£261,680	£313,503	£409,238	**£1,809,909**
Total £ saved - inflation and time adjusted	£16,535	£59,471	£109,411	£148,612	£303,484	£285,405	£280,959	£325,912	£409,238	**£1,939,027**

Figure 14: Benefits summary (base scenario)

Cost vs benefits summary (base scenario)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Cost per year	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**
Benefits per year	£16,535	£59,471	£109,411	£148,612	£303,484	£285,405	£280,959	£325,912	£409,238	**£1,939,027**
Benefits – Costs	-£409,963	-£56,268	-£59,829	£15,741	£198,227	£162,267	£75,635	£213,285	£311,189	**£450,284**
Benefit / cost	4%	51%	65%	112%	288%	232%	137%	289%	417%	**130%**

Figure 15: Cost vs benefits summary (base scenario)

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6. Evaluation of the implementation of the TFD and associated products

6.1 Introduction

Our process evaluation focuses on the implementation of the TFD and associated products. As such, our evidence is primarily, but not exclusively, taken from interviews with the Insight Bristol team who led this work. This includes former and current members of the team, who have been listed as simply team members to preserve anonymity where possible. However, we have named the 'Head of Service', which denotes the most senior person responsible for developing and taking decisions in respect of the TFD.

As with our outcomes evaluation, we use elements drawn from our initial theory of change as the basis to structure our analysis, this time focussing on different implementation activities. These include tasks in relation to project set-up, project implementation, training and support and information governance.

It is important to set this section in an appropriate context. As the section will outline, at the point of commencing implementation of the TFD, there was felt by the Head of Service to be a certain culture of risk aversion at Bristol City Council, as well as significant budgetary constraints. As such, the Insight Bristol team describe how choices around delivery were often made out of necessity rather than a consideration of various options. In the words of one of those involved; "there was no other way to get it done".

In this sense, the evaluation in this section is not intended as a critique but as a way of shining a light on aspects of delivery that should be considered when attempting to implement products such as the TFD. In doing so, it offers a means by which outcomes and impact can be enhanced in Bristol and beyond. Indeed, having worked closely with Bristol City Council as part of this evaluation, we know that various lessons have been learnt which form the basis for improvements already underway.

6.2 Project Set-up

TFD purpose

As noted in section 3, the creation of the Think Family Database (TFD) product by the Insight team originated after sensing an opportunity to use data developed from service delivery in a smarter way. Specifically, focussing on identification of early risk and vulnerability in children and families:

> *"We realised the flaw in our approach: we were only learning about families after they had been referred, rather than understanding them beforehand… It's about early intervention. It*

> *helps identify referrals, capturing all the information to work out which families might develop more complex issues."* (Head of Service)

In addition to enabling practitioners to access individual children and family information, the Insight Bristol team also saw the potential value of using the data held within the TFD to deliver aggregated service trend information to assist senior decision-makers and commissioners in their decision-making processes.

The fundamental purpose of the TFD was therefore clearly defined from the outset:

- To support frontline practitioners with decision making about children and families by giving them easier access to key risk and vulnerability information, some of which they would not have previously been able to access, and to do so in a timely way. It was felt this would lead to earlier intervention and reduce the risk of children and families needing to access more acute, targeted services.
- To support managers and strategic decision makers by supplying aggregated data on trends and patterns around related risk metrics.

These purposes were captured as part of information governance provisions, described in *Section 6.5*. However, despite this initial clear definition of the function and purpose of the TFD, specific performance indicators relating to reach, impact and how the TFD improved practice were never formally created. The creation of such metrics might have supported the Insight Bristol team to test, validate and refine this sense of purpose on an ongoing basis, which was acknowledged as part our research:

> *"Our aim wasn't just for it to be used a lot we wanted it to be used in the right way that was impactful. So whilst we relied on usage to measure success, just usage isn't the right metric... it's the value added, which is more difficult to refine and we didn't really land on a way of capturing this."* (Insight Bristol team)

Targeted risk model purpose

The TFD initially brought together factual information from a range of different sources and presented this information back to practitioners in a unified way. The development of the targeted risk models marked a shift in this approach, and came from an ambition to deliver more instructive insight based on the data held within the TFD. This related to one of the core purposes of the TFD: a desire to identify risk and vulnerability at an earlier stage to enable earlier intervention.

Due to both local and national patterns of demand at the time of development, three risk areas were identified as suitable topic areas to develop targeted risk models for. These were children at risk of sexual exploitation (CSE), children at risk of criminal exploitation (CCE), and children at risk of not being in employment, education or training when they left school aged 16 (NEET).

'Recall' and 'precision' performance metrics were used to test efficacy of the risk models when they were built. Recall reflects a model's ability to find all positives, for example all children given certain criteria. A higher recall means fewer false negatives (children not identified). Whereas, precision reflects how often the model correctly identifies positives; in this case, children within these criteria. A higher precision indicates fewer false positives (wrongly identified children).

However, as with the TFD, specific measurable objectives to ascertain whether these risk models were achieving the desired impact were not developed, as noted in respect of the NEET model by a member of the Insight Bristol Team:

> *"This piece of work was always much less clear in scope… who the customer [and] who the user would be. It was less clear in scope what the evaluation framework was for it and what role I would play in tweaking and testing it."*

TFE purpose

Subsequently, in the first few years after the launch of the TFD (2015-2018), it became clear that schools and education teams suffered similar issues to those within Early Intervention teams in Bristol Council; a lack of comprehensive and timely data pertaining to the vulnerability of children and families. Also, it was recognised that accessing this information via phone and email was often a protracted process, as was linking professionals working in different organisations. As such, this became the primary purpose for developing the TFE at the outset:

> *"Joining professionals up more quickly for the use of data to make decisions more quickly to safeguard vulnerable children was the exact aim."* (Insight Bristol team)

A secondary purpose of the TFE was for the Council to track school attendance and ensure good quality attendance data. Access to such data could enable school staff to understand trends in school attendance, understand the barriers to school attendace and trends in relation to illness. The TFE was also seen as a means of ensuring consistency of information betweenschools and the council:

> *"It helped us to ensure that we've got the correct information flowing both ways. So, our education stats team has the correct number of suspensions as according to the school."* (Insight Bristol team)

In this sense, there was a similar level of clarity regarding why the TFE was first developed as for the TFD. However, as with the TFD, thereafter, it seems that the TFE's specific objectives lacked sufficient clarity to effectively test the delivery of its purpose:

> *"Define your project terms and stakeholders and define what success looks like at the end of it. And I kind of felt like it was missing bits of that."* (Insight Bristol team)

TFD Governance

In terms of the development of the TFD, we found that it was conceived as a product to support the needs of certain teams within one department, rather than a cross-council project:

> *"I was in a slightly unique position that I had money, budget, authority and a workforce in a big organisation that couldn't really keep abreast of everything that was happening…the TFD was an internal department product, it wasn't a council product. It was me running my own department, creating a tool for my own staff."* (Head of Service)

There was also a perception that the council may not easily grasp the need for an agile development approach required to build the nascent TFD and a sense that their internal governance procedures could potentially impede its development. As such, work on the TFD was undertaken without promoting or showcasing it more widely to other departments on a regular basis. Members of the Insight Bristol team described the benefits of this approach in terms of the dynamism to test and learn at pace without the constraints of cross-department acceptance processes. It also allowed development and testing of an approach that could enable information sharing on the basis of public task, rather than though individual consent, a key underpinning element of the TFD:

> *"We had free reign to get on with it. We of course involved the experts that we needed to: we worked really closely with information governance colleagues, information security and members of the team also worked in performance and reporting."* Insight Bristol team)

Over time, consultation with other senior leaders did take place, but formal governance for the TFD was not established across the council and did not exist for many years:

> *"It is part of the unorthodox way in which it emerged. There wasn't any formal governance for probably six or seven years. The Insight team governed and maintained it."* (Insight Bristol team)

However, for all the advantages in terms of developing momentum, the absence of an independent governance forum involving senior stakeholders and staff using the TFD seems to have led to a number of other less positive consequences. When problems have arisen with aspects of the TFD, there hasn't always been a natural place for them to be addressed, which has meant problems have sometimes persisted longer than they should. For example, internal acknowledgement of inaccuracy of the CCE and CSE targeted risk models was lacking, as noted in *Section 5.4*.

There is also some duplication of functionality across different technological tools used by Bristol children's services, which was highlighted by practitioners we spoke to, as mentioned in *Section 5.2*. Without a clear decision by the service on what digital products should be used, by whom and in what instances, in many cases personal preference surfaced as the key determining factor, taking some staff away from using the TFD.

> *I don't use TFD as much as I could, because of the "multiple systems" thing – we've got our own case recording system where we put stuff in."* (Early Intervention Manager)

In addition, a consequence of not fully embedding the TFD as a mandatory element of the technological ecosystem has meant that it has been subject to the whims of different senior staff at different points. For example, one senior stakeholder was unclear on how data sharing on the basis

of public task worked and therefore paused the development of the TFE product, only for activity to continue after they left.

Others note that a lack of shared ownership has meant the TFD has become reliant on certain individuals to champion it. This presents challenges when these individuals leave, as their knowledge, connections and influence depart with them. Additionally, this leaves the TFD in a vulnerable position in terms of securing long-term funding to maintain the product as well as the technical and business liaison teams that support it:

> *"The management of the tool relies on key individuals within the team rather than shared council governance, which posed threats to its sustainability."* (Insight Bristol team)
>
> *"In terms of long scale sustainability of the tool, I think it is low because it was developed off on one side and it wasn't well accepted by the rest of the teams as much. And the IT structures, they didn't really know about it."* (Insight Bristol team)

TFE Governance

When the TFE was first launched, a governance group, with the Council's Safeguarding Education Team, was set up, who made decisions about the tool build and roll-out. According to the Insight Bristol team, the governance group was an essential part of launching the TFE, as it helped with decision making and transparency. However, alongside recent changes to the Insight Bristol team, this governance has fallen away, with the team reporting no current governance (as of December 2023). This has caused concern amongst some around how decisions around the TFE are made:

> *"It can't just be our team making the decisions on information that is shared with all school settings or within the TFD… the TFE needs to have a governance board in place which we did have up to about six months ago when the team changed so much. With all of our roles changing, we had to restructure."* (Insight Bristol team)

However, this situation may improve soon. A meeting of community leads, the safeguarding education team and the head of Early Help have met over the last few months to decide on the future of the TFE and discuss how decisions should be made. They are currently in the process of setting up a more formalised governance group that will meet regularly to discuss decisions about the TFE.

6.3 Project Implementation

User engagement and design

Engagement was at the heart of a user-centred approach to developing and implementing the TFD, with significant engagement early-on from the Early Intervention and Triage teams:

> *"We were reviewing the performance of that functional and end user experience by speaking to the Early Help Managers and getting their feedback."* (Insight Bristol)

Working closely with users and understanding their needs ensured that the datasets that the TFD brought together were relevant and would make a difference to their work. For example, the use of school attendance, which was noted by practitioners as a particularly useful piece of information. This included datasets that hadn't previously been accessible by practitioners in Children's Services, for example, Child and Adolescent Mental Health Services (CAMHS) data. Different practitioners spoke to the benefits of this approach:

> *"We were very much involved from the beginning of TFD. And it helped in terms of what we needed from the system. I use TFD pretty much on a daily basis."* (Early Intervention Manager)

This kind of intensive engagement work also ensured there was commitment and buy-in from end users when the tool was ready to be used:

> *"We've built the emotional buy-in of the staff that believe they've contributed and created a tool for their own use… We knew what we were going to create in the dashboard because we got years of experience of it. But it's that buy-in" (*Head of Service)

From a technical point of view how this data was brought together was equally important. In the past, members of the Insight Bristol Team describe that, whilst family members were linked on case management systems, data wasn't brigaded in a way where the needs of a whole family could be understood easily. Also, data from external sources was accessed via a large spreadsheet, making retrieving insight on individuals challenging. Spreadsheets were also sent on an ad hoc basis and therefore relied on manual request and send processes, meaning data would quickly become out of date, leading in some instances to wasted work.

The development of the TFD addressed these issues. It brought together a wide range of data that was visualised to give a comprehensive picture of family need, and, importantly, ensured data was very close to what was contained in source systems by securing data extracts from partners on a daily basis.

We can see that this technical achievement is directly related to the outcomes noted in Section 5.2; namely, better risk assessment by having rich contextual information around the whole family, and timelier responses in what can be fast moving situations by having near real time updates and notifications.

Members of the Insight Bristol team described how they adopted an iterative and opportunistic approach in the early stages of implementation, in terms of working with those who were most open and willing to test it as it was being created. This enabled a smoother design and acceptance process which was important in making early progress:

> *"We went with the least resistance and that we pretty well found the people who used the system the most and then went to them and said, why are you using the system and what else would you like to see?"* (Insight Bristol team)

However, it seems that an approach which focussed on those most willing to test and use the emerging product may not have surfaced with sufficient clarity the reasons why other practitioners didn't use it, which could have developed a product with wider appeal.

> *"It was meaningful engagement with fewer users rather than having tons of people with access who never logged on, but I'd say we didn't write that down ever as a philosophy or a plan…We didn't really ever go along to the 50% who didn't and say, why aren't you, you know, it was up to them if they used it, they used it, they didn't, they didn't."* (Insight Bristol team)

Also, this more organic approach to involvement meant that development activity wasn't always systematically planned. For example, those in the Insight Bristol team describe user requirement validation processes as being somewhat informal:

> *"We didn't look at any formal evaluation or anything like that. It was if we make a tool available and no one uses it, we know it doesn't work. If they use it, we know it works."* (Insight Bristol team)

Whilst intensive engagement took place in the development of tools, thereafter some of those we talked to describe how this fell away with some aspects of the TFD, for example the development and iteration of the targeted risk models and strategic apps. This may in part explain why these elements showed less uptake than other elements of the TFD.

> *"I had no involvement at all really with stakeholders after the [NEET] model was delivered. It was that phase that was missing."* (Insight Bristol team)
>
> *"Maybe we just didn't work hard enough with the commissioning team to meet their needs, So maybe that's the gap."* (Head of Service)
>
> *"The original Qlik app worked really well and actually it was really useful but then, there was changes done without my consultation."* (Early Intervention Manager)

In addition, we found that not having a planned approach to understanding user needs may have led to missed opportunities. Firstly, although most of the practitioners praised the user experience of the TFD, some spoke of issues in terms of the number of windows 'popping up' which can make navigation challenging. Although seen as a useful feature by some, we were unclear as to whether this, and other user experience issues, were documented and being considered as part of ongoing improvements to the product.

Practitioners also suggested other datasets that would further enhance the TFD's value. Such as contact numbers for GPs and health visitors, probation and housing data, and more information on the entire history of a family. Also, others pointed to the existence of use cases beyond those of

council teams that could have been capitalised upon and been mutually beneficial. For example, the Family Nurse Partnership:

> *"I think they would find it really useful to be able to access the data that's on TFD because they are quite often the key person involved."* (Early Intervention Practitioner)

We understand that the TFD front-end as it stands will be replaced by an updated product called the 'Children and Families View', which will be built in PowerBI. Given this, the lack of a future roadmap is understandable. Yet, we also found that the TFD has lacked this kind of strategic plan to guide its development since its inception. This caused us to wonder whether a more systematic approach to understanding user requirements and change requests may have supported a sense of clarity about its future direction.

We're also aware that this kind of engagement, planning and strategic thinking requires sufficient time and capacity from those in the team. From our conversations with those in the Insight Bristol team, we understand that finite team resource meant that decisions had to be made that prioritised certain delivery tasks over others. As such, there is an acknowledgment of the need to take a more systematic approach, but a lack of capacity seems to have been a key factor in why this was not possible in the earlier stages of development.

Roll-out

At the point of going live, those we spoke to described how there was a proactive push, a newsletter and more contact time spent supporting users, after this was identified as a need, all of which supported roll-out. A lot of internal communication occurred organically through word-of-mouth exchanges among users and through the Insight teams on-the-ground presence, which was well received by teams.

More broadly, the Insight Bristol team invested time in external communications too, which brought national recognition in the form of different awards. As the Head of Service makes clear, this kind of attention served to reassure internal audiences of the legality and robustness of the approach being taken:

> *"A lot of national communication went on, and then we've got the government funding from everyone. Winning awards was an enabler. To give people confidence with the approach." (Head of Service)*

In some places this approach was particularly effective - managers knew about the TFD and promoted it to their staff; however, in other areas this didn't happen. Such a strategy may account for some of the discrepancies in awareness of the TFD, as noted in *Section 5.2.* Furthermore, we found that among practitioners who were users of the TFD, knowledge gaps remained about how it functions and what some of its data represents.

Given the scope of the TFD in terms of the number of datasets and possible functionality, knowledge gaps may be inevitable, but it might suggest that a greater depth of information was needed as part of communicating with users.

The proposed approach for scaling usage with Social Care teams was described as primarily email engagement as well as via senior colleagues cascading to their teams, presenting the TFD and how it might be used most relevantly in their own service areas. However, it seems this approach didn't work as was expected and in many cases users did not understand the added value it might offer them.

> *"I'd engage regularly with the heads of Social Care but the cascading didn't work so well and to be fair, they just see it as another system".* (Insight Bristol team)

This offers some explanation for the different perceptions of benefit between Social Care teams and others, as outlined in *Section 5.2*. We also found that a lack of funding, in terms of being able to understand user needs and develop a specific product for Social Care teams, was the key driver in terms of the approach taken with these teams. Since this time, new funding has been agreed and a bespoke app for Social Workers is being developed which uses data from the TFD.

With regard to the TFE, the Insight Bristol team wanted to create a more restricted and purpose-built version of the TFD. To do this, a member of the team spent time within a pilot school gathering information on what kinds of levels of data would be required. The tool was then rolled out to the several more pilot schools, and then offered to all schools in Bristol. In managing the project rollout to schools, the Insight team assigned two dedicated resources to lead the rollout of the tool. Engagement with end users at the start was useful in being able to gauge the right level of detail and data sharing in the app.

Rolling out the TFE to schools, involved delivering training packages and having schools staff sign a charter, agreeing to proper use. However, in terms of future development, the Insight team manager noted that there is no roadmap, again due to the lack of funding, and though there are a few schools who use the tool very regularly and others who don't use it at all, there is no more resource available to develop and embed the TFE across educational settings in Bristol. There is, therefore, a risk that the TFE might encounter similar disengagement to that which we have witnessed with the TFD, where practitioners don't fully understand how to use the tool or what the information within it means.

This finding suggests that significant ongoing work, and therefore funding, is required to support, maintain and further develop the TFD, TFE and other similar products.

Measurement

Aside from talking directly to teams about their experience of using the TFD, the Insight Bristol team regularly monitored usage. This was consistent with the nature of the TFD being experimental at its inception, where developers were keen to understand what aspects of it were being used and what weren't.

> *"We have a TFD usage app that tracks usage. We can look to see what needs improving and what needs more development."* (Insight Bristol team)

However, as part of setting up the project, baseline measurements were not developed around existing data sharing practice, which would have been key to demonstrating the value of the TFD.

This is something we noted as a particular constraint when trying to perform a cost-benefit analysis as part of this evaluation, see *Section 5.5*.

Those we spoke to also described how usage of the TFD was used as a primary metric to demonstrate success. Yet, usage data alone may not give enough descriptive detail around *how* the product is being used or not. Without this insight, it may have been difficult to take informed decisions about elements of the product to improve or even decommission.

We noted this issue particularly in respect of the targeted risk models. Practitioners said that for some time the CCE and CSE risk models were regarded informally as inaccurate and unclear, however without regular mechanisms to monitor issues and sentiment, this was not picked up which potentially prevented corrective action being taken.

Some surveying of staff was done to understand benefits for frontline practitioners. However, surveys were conducted on an ad-hoc basis, reducing the ability to measure benefits over time.

> *"We could have been better about where the best value is, and how we measure that value. We looked at hits and were equating searches with value added; there's more to that than just that."* (Insight Bristol team)

In addition, as we note in Section 5.5, we assume that the TFD has driven value in areas that are less quantifiable. For example, through our conversations with practitioners we heard of examples where favourable outcomes for children or family have come directly from insight garnered from the TFD (see *Section 5.5*). Despite this, there was no clear means of recording the influence of the TFD in such instances. Having more of a planned approach to gathering data of this kind may have meant that these kinds of examples could have been captured and compiled over time as part of a growing evidence base to demonstrate the impact of the TFD.

We also noted a lack of rigour in terms of understanding and addressing issues around digital literacyamong staff groups. Again, a lack of this kind of data may make it difficult to understand and test Bristol's own theory of change and where improvements may need to be made.

The Head of Service conceded that a more thorough approach to monitoring and evaluation would have been desirable, but was difficult given the challenge of supporting rollout and the finite capacity of the team:

> *"Ideally, we would have had.. the ability to pause, take stock, evaluate, bring in, someone independent, to look at the approach to shift our approach and, and fine tune it, [but] we never had the capacity to really do a rigorous evaluation of what it was we were doing."* (Head of Service)

This is a well-documented challenge relating to the delivery of large projects which involve a large range of teams. However, a longer-term outcome of not performing evaluative work over the lifecycle of the TFD may be an inability to demonstrate its value and justify the ongoing business case for continued investment in it. Some we spoke to in the Insight Bristol team suggested that this has left the TFD somewhat vulnerable, especially as key individuals responsible for its development and ongoing success have left the organisation to pursue other opportunities.

Currently, the Insight Bristol team monitor TFE usage to measure impact, and Section 5.3 provides greater insight around the outcomes for practitioners and families with a particular focus on educational settings. However, since the launch of the TFE, processes to capture feedback from schools have not been regularly implemented, with performance information primarily limited to usage data. As such, we'd suggest that capturing more information about *how* the TFE is used and its benefits, represents an opportunity to develop an evidence base of its impact and how this could potentially be enhanced.

Documentation

In certain areas, we heard from the Bristol Insight team, and the information governance consultant, that Bristol have developed clear and robust documentation. For example, around information governance provisions to satisfy data protection legislation. In other areas, such as documenting the technical approach taken to building the TFD and its flows of data, this has been less considered:

> *"When I started there was no documentation at all. It was 'speak to [staff member] or [staff member[' because they had the knowledge."* (Insight Bristol team)

Since it was unclear whether or not the product would be a success, it is understandable that documentation was not initially created. The iterative way in which the TFD was developed also did not lend itself to the standard technical documentation processes within the Local Authority, involving detailed business cases and technical specifications. The Insight Bristol team therefore elected to invest time in product development instead of producing detailed technical documents.

> *"What we were doing was ground-breaking and innovative and that it meant that we didn't have existing documents that we could rely on because it was kind of all new"* (Insight Bristol team)

However, further into the project, project staff suggested that a lack of documentation in other key areas, such as how the product was built, meant there was a reliance on tacit knowledge held by individuals, which left the TFD vulnerable when these people left. This was particularly relevant to the risk models:

> *"Then [staff member] left and then [staff member] who was building the models also left and So, when he left, there were very little notes. Very few notes on it"* (Insight Bristol team)
>
> *"If there have been changes since it went to the police, I only know that anecdotally. The risk models were developed by a person who left, with various consequences… When people have moved on, we have struggled to navigate, to maintain the consistency of the model from the police end. Then we're using information that is potentially really vulnerable."* (Senior Manager within Children's Services)

We found that a lack of this type of documentation had a clear service impact, as outlined in *Section 5.4.1*: it was difficult to support practitioners to understand why certain children had been identified by the risk models to be able to inform subsequent interventions.

Indeed, the initial scope of this evaluation was to test the accuracy of the risk models, to be carried out by statisticians from the University of Edinburgh. However, after an extensive search for documentation on how the risk models were built, this could not be located. The difficulty establishing accuracy that this situation creates, leaves open a broader question around accountability. Additionally, it leaves Insight Bristol staff in a position where they may be unable to describe to practitioners in detail what the outputs of such models mean. We understand that establishing the lack of documentation in relation to the risk models was an important factor in the CCE and CSE models being decommissioned during the course of our research.

Over the course of this evaluation, we have highlighted where there are gaps in key technical documents that should have been in place to support the TFD, and have seen that this has created an impetus to produce these documents, which will support the TFD going forward.

6.4 Training and Support

We found that training has been offered flexibly, and was available on request for large teams, as well as on a one-to-one basis where required. Additional resources like a user guide (TFD and TFE), as well as recorded previous training, are also available. Training covers usability and "scene-setting" (Programme Manager) in terms of the context of the TFD as an approach, which is seen as an important element given practitioners joining from different local authorities may not have experienced a similar product in the past.

The large majority of practitioners we spoke to were aware of who the Insight team are and that they could ask for support. As with training, practitioners from a range of teams spoke positively about this provision. The role of the Business Relationship Manager has proven to be key for training and ongoing support, but also for engagement, feedback collection and communications, which were facilitated by the frequent interactions the Business Relationship Manager had with practitioners:

> *"Found very useful to have the training, to see how it can be used, there are some features I would not have discovered otherwise."* (Early Intervention Practitioner)
>
> *"They're very responsive. I've never been ignored when we've raised an issue with it and they've always been very sort of open feedback."* (Early Intervention Manager)

Whilst 74% of those we surveyed said they received training, only 60% felt this was adequate in terms of using the TFD. This is particularly important given our finding detailed in *Section 5.2* that perception of the TFD's impacts differs markedly across those who feel they've received adequate training and those who feel they haven't.

One explanation for differential usage may be that training isn't mandatory, although it is offered to all new starters. Therefore, the level at which it is promoted by different managers can differ and may be impacted by the extent to which managers are aware of the TFD. Furthermore, specific training isn't developed and offered as standard to support understanding of new features and functionality, which in turn may in part explain why some of the most complex functions are used significantly less than more basic search pages.

More broadly, we found that the approach to training, as with implementation in general, has been more organic and relational than systematic or insight-led. In practice, this means that training and support, in general, is normally offered in response to requests:

> *"If people have problems, they'd just wait until I was in, then they'd catch me and talk to me about it, if that makes sense."* (Insight Bristol Team)
>
> *"If we've had lots of requests to do training, I'll try and group them all together into one session. But then other times it's just like one or two people."* (Insight Bristol Team)

A less systematic approach to training may stem from a lack of rigour in terms of understanding training and data literacy needs across the workforce, which makes strategic decisions about training provision more challenging. Indeed, not having this type of insight may have made engagement with certain teams more challenging. For example, it was noted that data literacy and cultural issues around use of digital tools in general was a particular issue in Social Care teams, who saw their work as being more of a face-to-face relational practice.

> *"I would've probably spent more time working with social care on their engagement, whether it could be useful for them, because there was always a big gap."* (Insight Bristol Team)
>
> *"But when you realise how poor some of the digital maturity was, training was helpful."* (Insight Bristol team)

In terms of the TFE, a mandatory training video is a requirement prior to use, although most of the people we surveyed didn't consider this training. 36% of those we surveyed said they hadn't received sufficient training to navigate the TFE. In this sense, although the TFD and TFE were designed specifically to be easy to use, it seems this isn't the case for everyone. However, since processes to capture detailed information about the types of challenges people experience don't currently exist, training provision may not be targeting where it is needed most.

Above all, an inability to address training and support needs may be a resource issue. When speaking with the Insight Bristol team, they were aware of the patterns alluded to above but felt somewhat powerless in terms of the lack of budget to employ staff to address knowledge and confidence gaps and coordinate training accordingly:

> *"We've been kind of stripped back to pretty much one person supporting the whole program now. So actually the development going forward is going to be really limited. And that's, yeah, a concern,"* (Insight Bristol team)

As such, it seems that increased investment in this area would be a key way of driving value and efficiencies in services more broadly.

6.5 Information Governance

We found that the Insight Bristol team recognised the importance of information governance and ethics in delivering the TFD and, as such, considerable time, attention and expertise was focussed in this area. This involved employing an independent specialist in information governance and working with the Centre for Data Ethics and Innovation to develop six best practice principles for work in this area. These were as follows:

1. Public benefit and Value
2. Responsible and Accountable
3. Secure and Private
4. Being Transparent
5. Accurate and Reliable
6. Fair

The Head of Service notes that the development of this work took place because they weren't aware of other work done to consider ethics in the domain of data sharing in Children's Services that could be drawn upon. In this respect, as with the development of technical elements of the TFD, ethical considerations were pioneering:

> *"There wasn't anybody doing any work on the ethical use of data in this context. So there wasn't anyone you could talk to."*

As with other elements of this section, our review principally concerns how information governance has been implemented in practice. Since this evaluation doesn't have a specific information governance focus, it will therefore not be an authoritative assessment of the data protection practice in respect of the TFD. Instead, it offers insight and points of consideration by reporting the views of staff regarding the approach taken and how this could potentially be adjusted moving forward. For clarity, we will use the different principles contained in the UK GDPR as a basis for review, which broadly align with the 6 ethics principles developed by Bristol.

Lawfulness, Fairness and Transparency

Bristol cites a range of legislative gateways to justify the use of the TFD, this is in line with precedents set before and after its development. Our conversations with the Data Protection Officer and Information Governance professionals in Bristol City Council indicate they were all confident of the lawful underpinning of the TFD and accepted the lawfulness of the approach taken.

> *"We've had enough very qualified Information Governance professionals working on this to be able to provide a robust argument to any conflicts or anybody saying … we don't have a legal gateway."* (Head of Service)

However, using legislative gateways instead of consent for data sharing did represent a change. As noted by the Head of Service:

> *"Our approach to the information governance was very, very new, probably the first in the country to do what we did around public task and relying on legislation pretty much no one had ever done th*at before." (Head of Service)

The issue of consent was raised with us on a number of occasions by practitioners, which suggests a wider lack of understanding around information governance in respect of the TFD at a practitioner level. Practitioners also reported that they struggle with feeling confident about speaking to other professionals when a family has not been asked for consent, in turn suggesting that more support is needed beyond communication of a change in policy. This lack of clarity among staff may, in part, explain the significance of the impact on TFD usage rates following Ofsted's line of questioning around having consent for information sharing (discussed in *Section 5.2.5*).

Information Governance for the TFE was developed as an extension of that developed for the TFD. Our conversations with some school staff reflected a similar uncertainty about the basis for sharing data. For example, two teachers expressed confusion about whether or not families had to consent to information being shared on the TFE. As with the TFD, such confusion points to a potential gap in understanding among staff in this area.

In terms of transparency, the Insight Bristol team consulted and engaged with different groups from the general public to hone its messaging:

> *"They did lots of consultation, which often doesn't happen because it's time consuming and expensive."* (IG consultant)

A privacy notice and other information is accessible on Bristol City Council's externally facing website. Bristol residents were also notified that their information may be included in the TFD in Council tax letters and were given an option to opt out. However, it is unclear how clear and meaningful this content is for people without specialist knowledge of data protection, especially given the complexity of some aspects of the TFD, such as the risk models. Some practitioners we spoke to had some continuing reservations in relation to this:

> *"Something that's always on my mind – do the people we're talking about know we have this data? Particularly the risk scores." (Early Intervention practitioner)*

Such a concern is brought into greater relief in light of the fact that Insight Bristol aren't clear themselves about how the risk models were built and developed. Although the risk models considered in this evaluation have either been withdrawn or shortly will be, demonstrating clearly what data these use and how they work for practitioners and the public would need to be a consideration for their next iteration.

Instances of risk models giving inaccurate outputs to practitioners also represented a concern in relation to 'fairness'. Namely, that potentially some families are being erroneously identified, or not-

identified, as being vulnerable. However, we also found that processes were in place within frontline teams to check and correct any inaccuracies, though this perhaps shouldn't be relied upon in future.

Beyond this, we received no feedback in relation to fairness issues. Many of the people we spoke to discussed how the TFD simply unifies data that professionals would have access to anyway, but does so in a far more timely and intuitive way. As Section 5 outlines, the outcome of this serves to enhance the effectiveness and efficiency of practitioners in Children's Services. In this sense, it can be argued that a key strength of the approach has been its innovative interpretation of legislation in order to provide better or fairer services for vulnerable children and families.

Accuracy

Since the TFD principally visualises factual information taken directly from source, rather than processed data, the scope of our review didn't extend to understanding the accuracy of underlying data sources in detail. However, we did review practitioner *perceptions* of data accuracy (noted in *Section 5.2.5*), since this may impact usage and attendant benefits.

In the main, users felt that the factual data that the TFD and TFE contains was accurate. This is the case for the TFD as well as the TFE. 80% felt that data contained in the TFD was accurate and 75% said data in the TFE was 'mostly accurate' or 'quite accurate.'. Whilst only 3% of those said that perceived inaccuracies are enough to stop them using the TFD altogether, 34% said they were enough to treat data from the TFD with caution. However, we suspect that this may also be the case in terms of perception of data quality from source systems.

We did surface some concerns around the accuracy of data that is processed that can be considered part of the TFD approach, specifically around the quality of outputs displayed via the targeted risk models. Many of those we spoke to highlighted accuracy issues in respect of the outputs of the CCE and CSE models, which in turn impacts usage:

> *"There are times where it's not accurate, it can be a bit misleading. I wouldn't go into a meeting saying I've seen this on TFD because I wouldn't be confident that that is accurate enough."* (Early Intervention Practitioner)

As noted above, these models have been discontinued, but they do offer cautionary lessons in terms of how these types of risk models are developed to ensure an accurate output. A former staff member who was closely involved in the development of these models noted that they don't use enough datasets that are of sufficient quality to guarantee accurate risk scoring:

> *"I never thought we had enough data. I never thought the quality was good enough,"* (Insight Bristol team)

Purpose Limitation and Data Minimisation

There was consideration of the exact purpose for which data was being used, which an IG specialist told us correlates to the tasks carried out by the staff teams that the TFD was designed for. The Insight Bristol team feel that this approach has been honed over time. They clarified that access to the TFD was granted on the basis of performing a safeguarding role, with a need to view data about a constrained group of individuals with defined support needs or possible safeguarding concerns.

As noted above, our research suggests that teams use the TFD in different ways. In most cases this is explained by personal preferences, with practitioners able to access some of the datasets that the TFD visualises via other source systems, which can be accessed independently. Where users are unable to access datasets independently, such as with TFE users, many of those we spoke to described data as being minimised to the point of providing only broad contextual information:

> *"There is minimal information on there, but it's probably enough to just give you a bit of an overview which can then potentially lead to some support conversations or helpful conversations with families." (Family Support and Safeguarding Lead, Primary)*

However, in some cases some teams felt as though they had access to some data that went beyond the scope of their roles, for example, data from risk models which was developed only for certain Early Intervention teams, or other more sensitive data (see section 5.2.4.). However, it should be noted that this issue is not unique to the TFD and is an issue across different case management systems.

The Insight Bristol Team outlined how their process for agreeing and granting access to different datasets involves seeking approval from data owners, as well as from team managers, to ensure operational relevance. However, we felt there may be scope to be more specific around the purposes of use cases on a team by team basis, which may represent a more prudent interpretation and application of purpose limitation and data minimisation principles. For clarity, we are not suggesting that Bristol Council is failing to apply these principles or that non-application is leading to negative consequences. Nevertheless, more specificity around team use cases may provide a greater level of assurance that practitioners are only accessing data that is relevant for tasks they need to perform as part of their roles.

Storage Limitation

The TFD mostly shows data from the last 12 months, which, compared to approaches adopted by other local authorities, is eminently prudent in terms of storage limitation. Social Care practitioners made it clear that data covering a wider timescale, for example 3 years, would be more useful in developing a more nuanced understanding of vulnerability. It is unclear whether this forms part of the new Children and Families View product developed in Bristol, but may be worth considering if it is not, as well as possibly revisiting the use cases of Triage and Early Intervention teams with this in mind.

Integrity and Confidentiality

We understand that controls are in place limiting access to the TFD to named practitioners whose roles dictate that they require access and who have been trained by the Insight team. We heard that policies are in place which mean users who have not used the system in 6 months have their access revoked. These are designed to protect the confidentiality of individuals whose data is held within the database. TFD usage is monitored and audited, and any potential misuse identified is reported to managers, with remedial action subsequently taken. Furthermore, we heard how this process functions well and addresses concerns as and when they arise.

The TFD is hosted on a secure data lake, with access to raw data limited to a small number of analysts.

7 Conclusion

7.1 Outcomes

This evaluation firstly set out to evaluate whether the TFD and its associated products enables a range of outcomes for practitioners and managers in Bristol City Council. Our research shows that, on the whole, anticipated outcomes as described in the theory of change are in evidence.

It is clear that, by bringing together disparate datasets into one place that can be easily accessed, there is better assessment of risk and more informed, timelier decisions are made by a range of practitioners and managers. Furthermore, it is clear that the TFD reduces the retrieval burden for these staff, saving them time engaging in onerous manual processes to collate this information. A range of other benefits were also noted, in terms of better preparing practitioners to go into sensitive situations or identifying children with only a very limited amount of existing information, for example, using only a name on a school jumper. It wasn't surprising, therefore, that 72% of staff who the TFD was originally designed for (Triage and Early Intervention teams) agree that it has a positive impact on their work.

It is also clear that the TFE confers similar benefits for those that use it. This product enables staff to be more proactive in planning support for children in school, be more responsive to situations when they change, and offer more timely interventions as a result. Likewise, the TFE also saves school staff time in terms of retrieving information, as well as linking them with other professionals faster than would otherwise have been the case. Again, it feels as though there is a clear basis for understanding why 85% of people surveyed report that the TFE has a positive impact on their work,

However, we also found something of a mixed picture in terms of benefits experienced by practitioners in the Council and schools, which points to areas in which the outcomes that the TFD and TFE enables could be improved.

Firstly, our theory of change noted that, by enabling more informed service planning decisions, the TFD might address an issue around lack of strategic insight. While there are some examples of where this has happened with good effect, on the whole, it seems that the Qlik aggregated view app doesn't support such outcomes in a meaningful way. However, this may be due to the strategic use case of a self-service product being less clear. As such, it seems that more in-depth analysis of TFD data via support from the Insight Bristol team has been a more appropriate solution. In turn, it remains to be seen whether or not a self-serve product, can independently meet the needs of leaders tasked with making commissioning or strategic decisions.

We found aspects of the risk models more problematic. Although the CCE and CSE models were regarded as useful initially in supporting operational decision-making, following a change of ownership and, in turn, how these models were built – using only Police data, practitioners found them inaccurate to the point of being unusable. So much so, that these models have since been decommissioned. However, we also note the aspiration of this work and the innovation it represents in terms of driving change in a complex work area where practitioners lack insight to be able to be make timely and targeted interventions.

The NEET model is regarded as more accurate and seen as "useful" by some in terms of identifying at risk students who may otherwise go "under the radar."

In terms of use of the TFD and TFE, whilst many practitioners regularly use these and enjoy the above benefits, a significant number of others still do not. This seems to be driven by a lack of awareness, access to training, and preference for other options for sourcing data; as well as the perception of both products being relevant for certain types of tasks and roles more than others. This pattern of differential usage occurs across different teams as well as among colleagues within the same team.

We also found that enabling access to the TFD for Social Care teams has had mixed results in terms of driving benefits. For some of these practitioners, there is definite value. However, this relates to specific types of work that their role requires, for example, triage type tasks that may be necessary when 'on-duty'. For others, the use case is less clear. Although, the new '*Children and Families View*' product that will launch soon, seeks to remedy this.

7.2 Implementation

We recognise the challenge that implementing TFD represented, which the Head of Service summarised as "developing and embedding a new IT system across the department" (Head of Service). Largely, this challenge was met well, which can explain why the anticipated outcomes, as noted in the theory of change, were experienced.

The Insight Bristol team conducted intensive engagement with prospective front-end users, which yielded what most regard as products that are easy to navigate and intuitive to use. Indeed, the large array of data updated in near to real time, which visualises need at family level, can be regarded as a significant achievement, which took place in an environment that (at the time) was not particularly welcoming to innovation. at its inception, the TFD was at the forefront of data sharing practice in Children's Services.

Roll-out processes, that included provision of training and different types of communication, enabled a large range of teams to access, use and get value from the TFD, and, later, the TFE. Given the potential risks and ethical questions surrounding such a new way of working, it is clear the information governance was given considerable focus. While legal bases were used in a way that represented a change in how data sharing can be used to meaningfully support service delivery, we found that there may be further work to do in terms of making this more apparent and transparent to different stakeholders. We also found that, in some cases, practitioners raised the issue of having access to more information than they needed to fulfil their job role. As such, a more specific validation of use cases for individual teams for accessing different elements of the TFD may be a prudent consideration going forward.

As with our evaluation of outcomes, there were a range of areas that could be considered in terms of improvements around the approach to implementation. Firstly, these relate to a need at certain points for a more structured and systematic approach to delivery, which, in our view, could further enhance the outcomes already described. For example, whilst user engagement at the outset was intensive, this perhaps lacked a formality which may have driven increased usage by enabling a wider range of staff to input. Similarly, we found that a lack of detailed processes to understand how the TFD was used, may have contributed to the TFD not being iterated as it could have been in response to user experiences.

In addition, whilst a more relational approach to training was well received by teams on the ground, a detailed understanding of the nature of capability issues, and where these lie in the workforce, was not developed. Likewise, a range of communications were used, but perhaps lacked the level of planning to address specific gaps in awareness and understanding in different teams.

We also found there were gaps in terms of tracking and evaluating the TFD and its products on an ongoing basis. As well as documenting processes regarding how certain elements of the TFD were created. Aside from presenting contingency issues, this also presents a concern if there isn't clear understanding around what outputs mean, as we found for practitioners with the risk models.

We found that improvement to implementation also relates to a need to take a more holistic or systemic approach to create the conditions for the TFD to thrive on an ongoing basis.

We acknowledge the need for the Insight Bristol team to initially adopt an agile approach so that momentum could be developed. However, we found that a lack of governance after an initial development period has constrained the TFD and its ability to enable outcomes in different ways. For example, we heard that some practitioners preferred to navigate through source systems to find information, instead of using the TFD, which perhaps a more nuanced approach to engaging senior stakeholders earlier on may have been able to address. Also, since this type of engagement did not happen, to some extent the TFD has become reliant on individual staff to make the case for its continued investment, which potentially leaves the TFD in a vulnerable position going forward.

A feature of a systemic approach to delivery is understanding how different tasks and processes interact. For example, we noted that a long-term consequence of a lack of regular tracking of outcomes means it is harder to justify the business case, whether or not governance is in place. Also, not documenting processes may well have eroded the effectiveness of the targeted risk models, how these can be applied in practice, and the ability to improve them on an ongoing basis.

This being said, again we think it is important to conclude by referencing the context in which development of the TFD took place, as will be a consideration for all projects of this kind. We found that the conditions in which the Insight Bristol team were operating were such that their approach to implementation was less a considered choice, but the only way they felt that progress could be feasibly made. In this way, our findings represent a means by which Bristol and others can reflect and consider how their approach may be improved, in order to extend positive outcomes for practitioners and ultimately service users. Whilst the culture around innovation was noted as a constraint, the availability of budget and resource to adopt a more systematic and systemic approach to delivery was also a theme raised frequently in our evaluation. To recognise this point it has been included as the first recommendation in the final section of this report.

8 Recommendations

The 'Potential next steps for Bristol City Council' listed below, relate directly to potential areas of improvement in Bristol City Council's approach that we found as part of this evaluation. These are themed in respect of different implementation areas that we established in our theory of change and used to structure *Section 6.* The 'potential next steps' are designed to support Bristol City Council's thinking in terms of how the TFD and other products could be improved to enhance the benefits that users experience. We accept that, given budgetary constraints, it may not be possible to implement all of these, or all in full. We also accept that these potential next steps may be in the process of being considered or implemented.

As noted in *Sections 1* and *2*, this evaluation sits alongside a 'How to Create a Digital Single View of a Child' guide, which contains a full range of recommended tasks to enable a successful implementation of a TFD-type product. The synthesis of these tasks builds on Bristol City Council's learning as part of this evaluation, both in terms of reflections on what was particularly strong and areas for improvement, as well as additional interviews that were held. To broaden the relevance of this evaluation to other LAs seeking to emulate Bristol's approach, the sub-section below titled 'Lessons to be learned from the Bristol experience by LAs looking to deliver a similar product', summarises the stand-out lessons that can be learned from Bristol's experience. We have also given a reference to the relevant section within the 'How-to' guide that each relates to.

Potential next steps for Bristol City Council

Project set-up

1. Make a case for increased investment to ensure set-up, implementation, training and support, and information governance recommendations can be implemented, to enhance outcomes for practitioners and ensure the sustainability of the TFD.
2. Convene senior stakeholders to form a regular governance group for the TFD, and, where appropriate, convene separate groups for associated products (e.g., TFE), or include these as sub-groups.
3. Develop a strategic roadmap for the future development and iteration of the TFD and its products, developed in collaboration with stakeholders, both users of the products and at a requisite level of seniority to ensure that this roadmap fits with other strategic planning.

Project implementation

4. Ensure user involvement around future design and iteration of the TFD and future risk models to capture a diverse range of feedback.
5. Develop a clear understanding of the specific use case for future targeted risk model developments, to maximise usage and benefits.

6. Ensure all development and maintenance processes and procedures are clearly documented and organised for easy access. Including documentation of risk model processes to ensure adequate maintenance, re-training, and performance quantification
7. Implement regular tracking and evaluation of benefits as experienced by those using the TFD and risk models in practice, and, where possible, of evidence on wider service user benefits.
8. Develop processes whereby tracking and measurement information is fed into future planning and is available to a governance group.

Training and Support

9. Gather insight around awareness and knowledge gaps in relation to the TFD among users and non-users, as a basis for developing a strategic communications plan.
10. Gather insights around digital literacy and training needs across user groups, as a basis for developing a strategic training plan.
11. Ensure there is sufficient dedicated resource to support training and engagement that matches need, as a key factor for driving practitioner benefits and wider value across the service.

Information Governance

12. Consider specific communications for Bristol City Council staff around the legal basis for data sharing as part of the TFD approach.
13. Consider a process whereby, on a team by team basis, use cases can be assessed and access to datasets is specifically validated in respect of the scope of team activity. Thereafter, if necessary, limit access to certain teams based on scope of activity or usage patterns.
14. Review transparency around the TFD and its tools in terms of what information about them is publicly available, weighed in respect of what will be reasonably understood by a non-specialist audience.

Lessons to be learned from the Bristol experience by LAs looking to delivering a similar product

References relate to the sections within the 'How to Create a Digital Single View of a Child' (Project Manager) guide.

Setting Conditions

1. A robust evidence base that can inform a compelling story and clear business case for investing in a TFD-type solution should be developed. Doing so, is an important part of establishing and maintaining buy-in across different stakeholder groups. Importantly, this should contain baseline representative data on any issues the Single View would be seeking to address, prior to any development work taking place. (See Part 2.3)

2. There should be commitment at a senior level to understanding the nuances of the work area and making the necessary investment in terms of technical infrastructure and staff teams. This should include dedicated resource to support: project management, technical development and maintenance, workforce training and skills, and information governance. (See Part 2.3)

3. Robust and appropriate governance should be put in place to guide, advise and make decisions in respect of key developments, in order to maximise impact for practitioner users, and ensure long-term investment and coherence across all digital products in a local authority environment. (See Part 3.1.2)

Design and implementation

4. The development and roll-out of products should be done in a structured, systematic and transparent way, to enable the project to be governed effectively. This should include clear project plans and comprehensive stakeholder engagement and communication plans for internal and external audiences. (See Part 3.1)

5. The development of products should adopt agile user-focussed principles to ensure that user requirements are clearly understood and products are tested and refined in an ongoing iterative way. (See Part 3.2)

6. Mechanisms to track delivery of implementation tasks, outcomes for users and overall impact should be thoughtfully designed and implemented on a regular and ongoing basis. Doing so, can contribute to an evidence base to support sustained investment and potential expansion of this approach into other areas of council business. (See Part 3.1.3)

7. Development of information governance provisions, in the form of data sharing and processing agreements, should form a central element of any approach, including a deep consideration of potential ethical impacts that involves practitioner users and beneficiaries in a meaningful way. (See Part 3.5)

8. Documentation of operational and technical processes should be comprehensive, clear and well organised, to mitigate contingency issues should staff leave, and enable robust evaluation, testing, updates and improvement of products where relevant, for example, risk models and algorithms. The documentation of risk models would then enable adequate maintenance, re-training, and performance quantification; an essential element of deploying predictive analytics. (See Part 3.1.4)

Embedding of products

9. Appropriate training plans, provision and resources should be developed in response to specific training needs to deliver and maximise benefits for all users. This should be informed by data that demonstrates where and how improvements to user knowledge, skills and confidence are being made on an ongoing basis, and where there are continuing gaps. (See Part 4.1)

10. A roadmap of the future direction of products should be developed, kept updated, and shared regularly with users of the TFD-type product. This should be informed by user requirements in

order to progressively meet user needs, and enhance service benefits for beneficiaries more widely. (See Part 4.2)

9 Appendices

- Appendix 1 - History of the Supporting Families Programme
- Appendix 2 - List of Documents and Interviews
- Appendix 3 - Who created the TFD?
- Appendix 4 - Data Processing and Technical Infrastructure of the TFD
- Appendix 5 - Information governance
- Appendix 6 - Users of the TFD
- Appendix 7 – Targeted Risk Models: Technical detail and reason for creation
- Appendix 8 - Summarised Elements of the TFD: Description, Users, and Reason for Creation
- Appendix 9 - Detailed CBA methodology
- Appendix 10 – Technical Advisory Group membership

Appendix 1 – History of the Supporting Families Programme

- The origins of the database are rooted in the Troubled Families Programme (later renamed the Supporting Families Programme) which began in 2012. The original phase of the Supporting Families programme aimed to "'turn around' the lives of 120,000 families with multiple problems across England by May 2015". Local Authorities were asked to design and deliver a service offer that supported families facing multiple disadvantages, and upon families achieving positive outcomes linked to these disadvantages, the Local Authority could 'claim' through a Payment by Results (PBR) process up to £4,000 per family worked with through the scheme. To evidence these outcomes, Bristol began to collate data on the families that were being worked with throughout Phase 1 of the programme, which ran between 2012 and 2015.

Appendix 2 - List of documents, interviews and survey answers

2a. Documents Supplied by the Insight Bristol and Reviewed by Social Finance

- Information sharing agreement between Avon and Somerset Police and Bristol City Council.
- Avon and Somerset Police. 2022. *Multi-Agency Overarching Information Sharing Agreement Tier 1 & 2*
- Bristol City Council. 2016 / 2017. *Service transformation maturity model – Summary of Evidence*
- Bristol City Council self-assessment of progress against Digital Transformation strands.
- Bristol City Council and Children & Families Partnership. 2016-2018. *Memorandum of Understanding for Earned Autonomy: Family Outcome Plan*
- The plan for achieving better outcomes for families in the city, developed with partner agencies, including the Think Family team.
- Bristol City Council & Think Family Challenge Group (TFCG). 2017. *Service Transformation Maturity Model – Action Plan*
- Action plan for the continued development of practice in the Think Family team, including work on the TFD.
- Bristol City Council. 2018. *Troubled Families Programme: Memorandum of Understanding for Earned Autonomy*
- Application by Bristol for the Earned Autonomy funding, with high levels of detail on plans post 2018 if the funding is delivered, assessments of risk, expected outcomes, and key milestones.
- Bristol City Council. 2018. *Memorandum of Understanding: Staff Structure Charts*
- Visualised team structures at the time of creation, and proposed changes based on attainment of Earned Autonomy.
- Bristol City Council. 2018. *Memorandum of Understanding for Earned Autonomy: Earned Autonomy Targeted Support 2018/2019 budgets*
- Excel document with a breakdown of costs, income, and other financial details for 2022/2023.
- Bristol City Council. 2018. *Memorandum of Understanding for Earned Autonomy: Data Maturity Model*
- Framework detailing the stages of data maturity in Bristol at the time of creation, along with a list of priority actions.
- Bristol City Council. 2018. *Memorandum of Understanding for Earned Autonomy: Needs Analysis Supporting Data*
- Breakdown of financial and resource needs for children in care services.
- Bristol City Council. ~2018. *Lightweight Business Case: Think Family Database Access for External Organisations*
- Summarised business case for expanding TFD access to external partners, with 4 options explored, along with costs, implications of choice, and reasoning.
- Bristol City Council and Insight Bristol Team. 2020. *Child Sexual Exploitation City Profile*
- Report on the state of CSE and the results provided by the CSE model.
- Bristol City Council External Data Sharing Protocol Controller to Controller. 2022. *Sharing Data for 'Family Hubs' Bristol City Council External Information Sharing Agreement*
- Information sharing agreement between Bristol City Council and Sirona, to agree the sharing of health visitor information.
- Clarissa White Research. 2022. *Bristol Data Ethics Project*

- Ethics report completed for the data accelerator programme, contains headline information on how and why the database was built and what efforts have been to reduce the ethical impact.
- Insight Bristol Team. 2018. *Data Protection Impact Assessment - Supporting Families Programme*
- Data Protection Impact Assessment for the programme of work relating to the Supporting Families Programme being delivered by the Insight Team.
- Insight Bristol Team. 2018. *Memorandum of Understanding Strategic Profile of Bristol TFD use: Bristol Troubled Families – Think Family Database Analysis*
- A summary and review of the TFD, its criteria, and its analysis.
- Insight Bristol Team. 2018. *Tilley Awards 2018 Application Form*
- Application to the Tilley Awards by the Insight Bristol team on the basis of the work done on the CSE.
- Insight Bristol Team. ~2018. *Narrative Case Study: Bristol Integrated Analytical Hub*
- A summary of the TFD work this far and a reflection on the implementation and challenges of the targeted risk models.
- Insight Bristol Team. ~2018. *Narrative Case Study Version 2: Think Family Database*
- A summary of what the TFD is, its data sources and basic functions, user views and uses, and low detail impact.
- Insight Bristol Team. 2020. *Child Sexual Exploitation City Profile*
- A report that details the findings from the CSE model built by Insight Bristol and Avon and Somerset Police as part of the integrated analytic hub.
- Insight Bristol Team. Pre 2020. *Think Family Reporting for External Organisations*
- Summary of proposed structures for information sharing between the TFD and external partners.
- Insight Bristol Team and Bristol City Council. 2022. *Introduction to Insight Bristol and the Avon and Somerset Data Accelerator Programme*
- Summary of TFD and TFE functions, usage history, and analysis methodology.
- Insight Bristol Team. *Think Family Database BIL Process*
- Summary of dataflows into the TFD, assessment of risks, and methods of data transfer.
- NIHR Applied Research Collaboration West, Robert Blake Science College, Bridge Learning Campus. 2022. *Exemplar School's Project Generating the evidence base for system change and onward information sharing with educational settings, underpinned by a rigorous academic evaluation*
- Breakdown of proposal for implementing the TFE into schools, with sample views (overview, individual pupil, professional involvements, attendance record, intervention, vulnerability timeline) and findings of work so far.
- Itelligent-i. 2021. *Think Family Indicator Definitions v1*
- A full list of indicators at the time of creation of the document, with definitions including: a description, data source, data update frequency, indicator value format, data ranges, technical definitions, and comments.
- Think Family and Insight Bristol Team. 2015 & 2019. *Think Family Data Process Map*
- Insight Bristol Team. 2022. *Data Accelerator Programme. Bristol Data Ethics Project.* Slide deck
- Insight Bristol Team. 2022. *Bristol Data Ethics Principles*
- Insight Bristol Team. *TFE Indicator Index*
- Insight Bristol Team. 2022. *Think Family Education User Guide*
- Insight Bristol Team. 2022. *Think Family Education: Operational Guidance*
- Insight Bristol Team. *Think Family Education: Online Training Course.* Description document
- Insight Bristol Team. *Fuzzy matching rules*
- Insight Bristol Team. *TFD Architecture*

- Insight Bristol Team. *TFD User Guide*
- Insight Bristol Team. *Insights Data Models Presentation*

2b. List of Scoping & Mapping Phase Interviews

Figure 16: Interviews and conversations conducted for the Scoping & Mapping phases

Role or Group Descriptor	Number of Interviews Conducted
Head of Service for Early Intervention and Targeted Support & Programme Lead for Avon and Somerset Data Accelerator Programme	2
Insight Bristol Team Historic Leadership Team	1
Previous Business Relationship Manager & Programme Support Manager Early Intervention and Safer Communities	1
Data Accelerator Programme Officer and Project Manager for Think Family Education	2
Families in Focus Deputy Area Manager for North Bristol	1
Safer Options Team Manager	1
Insight Bristol Multi-Agency Analytics Hub Manager	2

Figure 17: Interviews conducted for the Evaluation phase

User groups	Number of Interviews Conducted
Early Intervention	9
TFE users (school)	6
Insights team	6
Social Care	4
Triage	4
Information governance	2
Other	2
TFE users (BRISTOL CITY COUNCIL education)	1
Police	1
Senior manager children services	1
Grand Total	**36**

Figure 18: Practitioners met during observation in Bristol

Some of the practitioners we met had already been interviewed online prior to our visit in Bristol

User groups	Number of Interviews Conducted
Triage	12

Early Intervention	9
Social Care	8
Insights team	1
Grand Total	**30**

2c. Survey answers

TFD - In total, we received 66 survey responses, of which 60 respondents were aware of the TFD. Respondents came from a range of job roles, including case holding roles (n=26), non-case holding roles (n=11), managers of non-case holding (n=10) and case holding (n=8) roles, triage practitioners (n=8) and services leads (n=2). Respondents came from a range of teams; however, the majority came from either Families in Focus (an Early Intervention team) (n=19) or First Response/First Assessment (n=16). Despite the range of respondents, given the relatively small sample size of the survey, survey findings were primarily used to validate and test alignment with in-depth findings from interviews

TFE - A survey gathered quantitative and qualitative insights and was distributed via Bristol City Council's networks via email. The survey received 66 responses, with 61 usable responses (5 were incomplete). Respondents worked in primary schools (n=42), secondary schools (n=14), specialist SEND schools (n=2), all-through schools (n=1), sixth form colleges (n=1) and other (n=1).

Appendix 3 – Who created the TFD?

Since 2015, Insight Bristol has been a multi-agency integrated analytics hub based at Bridewell Police Station, Bristol. The original team was made up of staff from Avon and Somerset Constabulary and Bristol City Council. In 2023 the team is now made up of analysts and developers from Bristol City Council sitting within the Insight Bristol team, however there is still a deep commitment to partnership working with the police.

The composition of the team involved with the initial setup and launch of the database was as follows.

- **Strategic manager:** A strategic manager with 30 years-experience in the police was appointed as Supporting Families coordinator in 2012 and acted as initial 'sponsor' of the team in 2015, allocating the budget, holding risks and defining the strategic ambitions of the team. This individual has held the strategic management of the team to this day.
- **Data governance expert:** An expert in information governance and data protection was commissioned from the NHS South Central and West Commissioning Support Unit, to design the information governance approach of the team.
- **LA Data expert:** An analyst from the Bristol City Council business intelligence team, who had a deep understanding of the LA data architecture, was seconded full time onto the team to support with the initial build of the database.

- **Police data scientist:** A data scientist from the police was recruited to support in the extraction, transfer and load process of police data.

Additionally, a freelance SQL developer was recruited full time to support with the building of the initial database.

As the database became more established, a team emerged consisting of a strategic manager, LA data expert, and a police data scientist, along with an additional three roles:

- **Analyst/Developer:** To support with the weekly loads of data and the Supporting Families payment by results process.
- **Risk model developer:** To develop the targeted risk models.
- **Business relationship manager:** To act as a liaison between frontline practitioners and the data team, understanding requirements, and translating these into specifications for the data team to develop the front end of the database and additional tools.

Naturally, over the years the composition of the team has flexed and shifted due to departures and the awarding of additional funding as part of time limited programmes of work. However, the 'core' of the team are two analysts to maintain the database and develop it, and a role that acts as a conduit between frontline services and offers non-technical project support.

Currently day-to-day tasks including data loading processes are led by 2-3 staff within the Insight Bristol Team within Bristol City Council, including the TFD technical lead. They share responsibility for overseeing the data loading from within the council and are the same staff that operate the database more generally. If there are challenges due to the networking or security arrangements, the council's IT services staff may be called in to support the process.

Appendix 4 – Data Processing and Technical Infrastructure of the TFD

This appendix presents a summary of the three stages of data processing carried out by the TFD, and the technical infrastructure that underpins the process. The three processes summarised below are: staging / cleaning, warehousing, and analysis.

It should be noted that the technology in this space has developed significantly since the TFD was first developed, and if the team were to undertake this project again, they would make changes to their initial approach, utilising these new technologies.

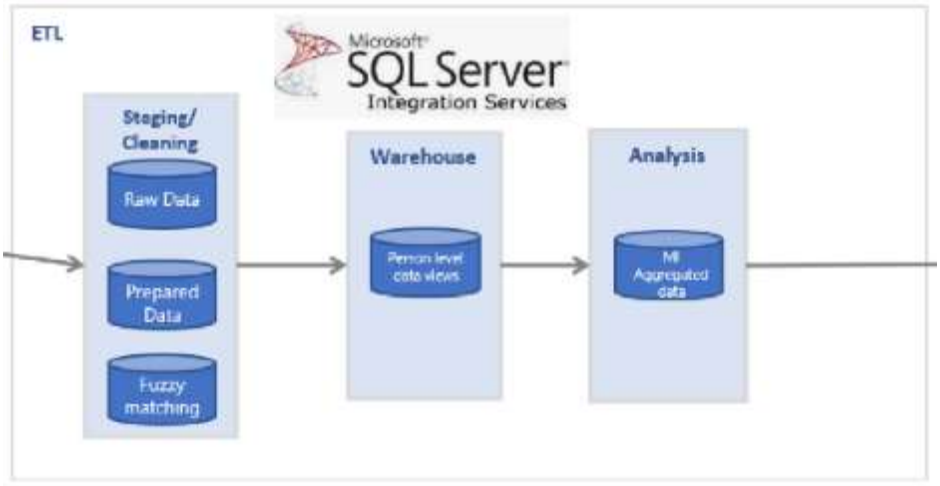


Figure 19: SQL Server data pathways

Staging / Cleaning

This describes the step in the processing of data where raw data is initially placed and transformed upon being loaded from its source.

New data is initially pulled into the Raw data tables within the Staging area, which is the unchanged tables downloaded from each source. Routines are then applied to clean up, format and deduplicate, and derive the required indicators from the raw data. Records are added to the relevant table in the Prepared section of the Staging area, which forms the basis of the warehouse structure. In this way, the main tables are populated; one each for data regarding:

- Individuals
- Households
- Families
- Vulnerabilities
- Lead Professionals
- Addresses
- Relationships

<u>Receiving Data: Pipelines and Data Sources</u>

The TFD consists of data on over 100 indicators, derived from data sourced from both within the council and externally. It therefore needs processes for reading up-to-date information from these sources into the database in a format that is useful.

This is accomplished through recurring processes drawing from 34 sources, which create 108 indicators from the council's own data sources, and the other organisations (including DWP and the NHS) the database draws data from.

Each process is tailored to the organisation and database from which data is being drawn, however most fall within two main ways of adding data to the system:

- *Direct Connections* – Credentials are supplied for the server holding the TFD to access the source server and select data from the relevant tables directly. This reduces the need for manual intervention, and along with it the risk of human error, but may be more difficult to set up from an IT and security perspective.

- *Network Drives* – Staff working with the source data export the latest data to a file (usually a CSV file, sometimes a MS Access database file), and upload it to the drive from which the TFD periodically pulls new data. This requires regular (generally weekly) input from members of staff, which takes time, and manually putting the datasets together sometimes leads to mistakes which prevent the data being loaded.

Matching

In order to connect data concerning the same individual across different data sources, a fuzzy matching script is used. This is a piece of code which allows records to be matched to one another despite slight discrepancies, such as typos when inputting dates of birth, or differing spellings of names. This is implemented as a script written in R.

The matching process is reported to be successful with 96% of records. The system flags where a match may be incorrect, and this information is highlighted in the frontend so practitioners can be aware and interrogate this. If a match can't be made with confidence, the data is shown as two separate individuals. The system doesn't attempt to fix issues in the data but surface them to practitioners who can then attempt to have them resolved at the source. This is important as it prevents data quality issues being hidden from users and leading to reduced trust in the system, and it reduces the risk that decisions are made on inaccurate data, while also reducing the burden of running the database.

After the matching process, the prepared data is added to the Warehouse, which is the 'live' part of the database, where it can be accessed by TFD users. Analysis is performed on this data.

Adding New Sources

The process for adding new sources of information is broadly the same for information held within Bristol City Council or held by external organisations.

Leads within the Insight Bristol team will connect with either internal or external managers to secure agreement to share information; negotiating to agree a method of data transfer, frequency of transfer, which data will be shared and for what purpose. These agreements will either amount to a one-way sharing of information (i.e. a partner organisation sends the council their data) or bilateral sharing (i.e. data is shared both ways).

For external organisations, they will agree to either providing Bristol City Council access to their database or to one of their staff spending time weekly/monthly/etc uploading the data to some mechanism for sharing. This may be through a portal, secure email or SSH File Transfer Protocol (SFTP) set up between the two organisations. As outlined, direct connections are the preferred method of transfer for internal datasets.

This sharing is all underpinned by information sharing agreements signed between the organisations, with updates/the creation of Data Protection Impact Assessments and updates to privacy notices.

Once this process is agreed, the TFD technical lead can start writing the scripts to incorporate the new data into the database and the relevant frontend views. They follow a structured process, and it typically amounts to less than a day's work – the majority of time is taken negotiating the information governance arrangements.

Warehousing

This describes the step in the processing of data where the data is being kept once it has been cleaned, formatted and matched. This is where most data is pulled from for users of the TFD to view.

Planned Switch to Remotely Hosted "Data Lake"
Bristol City Council is moving to a Data Lake approach for storing the data. This means that larger amounts of raw data would be kept on the server without first transforming it into a predetermined shape, alongside any processed data which is later derived from it. The advantages of this change would include, data not having to be transformed into a tightly defined schema for data before it is added, and defining schemas and data structures would not have to be done in advance. It would also retain flexibility in that, if you need to change the shape of the final product, you could easily adjust the code for transforming the raw data and run it again to get the updated version.

In tandem with this architectural change, the council has been considering moving to a "cloud-based" hosting solution with Microsoft Azure. This would mean there is no up-front cost of purchasing computers to hold the database, as the council would not own the servers the TFD is on, but rather rent storage and processing on Microsoft's network. This would mean cheaper up-front costs and reasonable storage costs, but likely higher costs of renting the processing power to perform data processing and transformation, which could potentially make the new system more expensive to run overall. Scaling the system to add more processing storage and processing power when needed would also be simpler as this can be done through the cloud package's application programming interface (API), rather than having to acquire and physically install new hardware.
It would mean the responsibility for supporting and maintaining hardware, and aspects of network security, does not lie with the council, though it also carries a risk of technical lock-in. This is, broadly speaking, where the cost and technical difficulty of switching any element of the system away from the chosen provider becomes prohibitive, which can mean significant problems when the provider decides to raise the prices of or stop offering particular services.

Analysis

This describes the step in the processing of data where the data used to create aggregated statistics derived from data in the main database, such as averages, totals and historical trends, are created, visualised, and then stored.

The TFD's main purpose is to compile and visualise existing data from disparate sources. Generally, it does not produce new pieces of data, save for the results produced by the targeted risk models, which work off TFD data and are then presented in the TFD frontend view alongside other data.

Visualising Data and Insights: Dashboards and other tools
The data is presented to practitioners in a useable and insightful way to complement their decision making. Practitioners access the data through an internally available website and apps. The site provides several 'views' which present information from the TFD in different ways including focuses on individuals, families, and professionals involved in a case. A permissions system ensures professionals can only access the views required for their job. Access and usage of these sites by frontline staff is tracked to allow inappropriate use of the database to be detected.

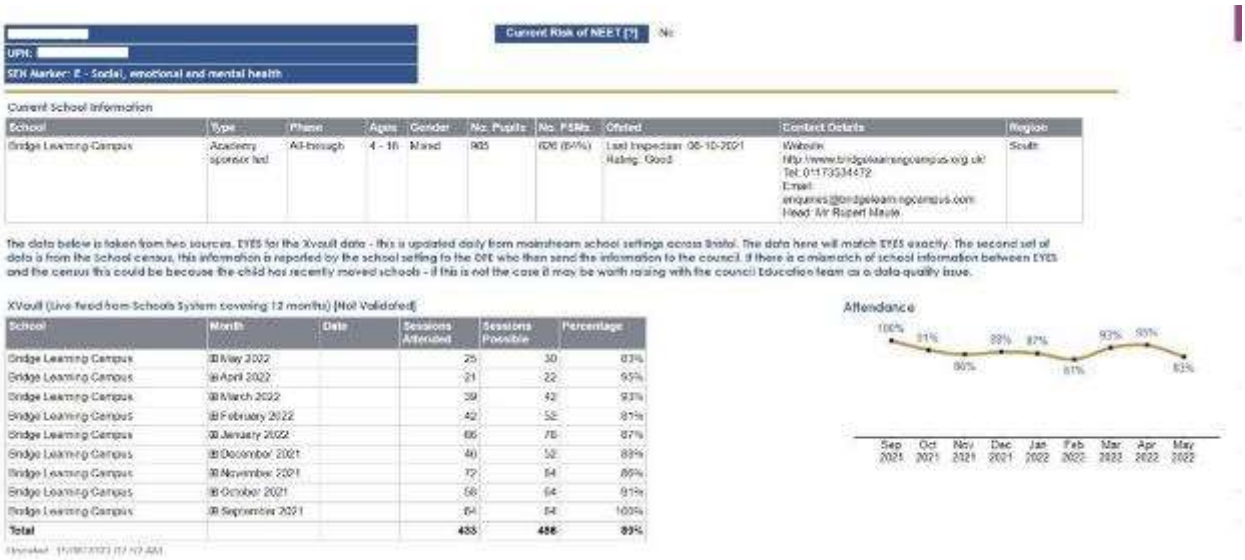


Figure 20: TFD School view 2022 from the Introduction to Insight Bristol and the Avon and Somerset Data Accelerator Programme

The websites are generated using SQL Server Reporting Services, which is the software included with the Microsoft SQL Server package for generating reports. Currently, some views use additional analytics from a service called Qlik, which produces analysis and graphics such as spatial heatmaps. The council is moving to using PowerBI for all the views as part of its wider move towards working on a Microsoft Stack, but this presents challenges with limiting and measuring access to underlying data in a granular way.

Appendix 5 – Information governance

This appendix lists the legal gateways identified by the Information Governance team around 2015 with the goal of providing legal basis for the activities being carried out in the development of the TFD.

- Care Act 2014 Section 1 and 3
- Childcare Act 2006 - Section 1 - General duties of local authority in relation to well-being of young children.
- Children (Leaving Care) Act 2000
- Crime and Disorder Act 1998 - Section 115
- Crime and Disorder Act 1998 - Section 17 - Duty to consider crime and disorder implications.
- Crime and Disorder Act 1998 - Section 37
- Criminal Justice Act 2003 - Section 325 of this Act details the arrangements for assessing risk posed by different offenders:
- Education Act 2002 - various sections
- Localism Act 2011
- The Children Act 1989
- The Children Act 2004 - Section 10 – Co-operation to improve well-being.

- The Children Act 2004 - Section 11 – Arrangements to safeguard and promote welfare.
- Welfare Reform Act 2012 - Section 13

The team collected this list to demonstrate, at the time, when work on the TFD was first being carried out, that they had stable and legitimate legal basis to carry out the work. They had to demonstrate this because, when the work started, the approach the team proposed was not commonplace and therefore the team expected it to be challenged, despite the confidence the team had in their legitimacy. Additionally, the creation of the TFD started before the implementation of the General Data Protection Regulation (GDPR), which then further required clear legal basis for the work the team was doing. The approach taken for information governance and legal backing for data processing for the TFD has since become commonplace across public bodies.

Appendix 6 – Users of the TFD

6a. Roll out of the TFD to different services

The roll out of the TFD to different services was approximately as follows:

- Families in Focus first group (early intervention service) - 2016
    - **Why were they added:** The team was added to support their delivery of the Supporting Families programme, particularly their statutory work around PBR (payment by results).
    - **Implications for the TFD:** This was the first point where the Insight Team was receiving requests for new data and feedback on the TFD's functionality and usability. It was essentially the soft launch of the TFD and its first tools.
- Push out to social care area units and the Youth Offending Team - 2016 – 2018
    - **Why were they added:** It was thought that some of the benefits realised by Early Intervention could be replicated with the Social Care and YOT units because they did similar work.
    - **Implications for the TFD:** The larger audience meant a larger body of feedback on the tool and the TFD. Expanding to these teams widened the scope of the indicators involved, since the Social Care teams were dealing with more complex cases with urgent needs, and YOT were interested in more offending data.
- First Response (triage) team access (most important rollout so far) - 2018
    - **Why were they added:** The decision to add this team came from both the Insight Bristol team seeing potential uses for the First Assessment Service (FAS), who act as the 'front door' to accessing Children's Services, and a desire from FAS leadership to pilot the tool amongst their staff. The First Response team were the main audience accessing multiple systems in their day-to-day work. The Insight Team and leadership of FAS thought the TFD would be helpful and save time. The pilot was then expanded after positive impact observed by leadership.
    - **Implications for the TFD:** This expansion created more of an impetus to understand all the individual professionals working with the family. This was important before but became more important because a primary focus of the FAS team is to connect professionals to coordinate work. Their work also required the most complete picture of an individual because the team were not engaging families directly but needed a

strong understanding of vulnerability and risk at the right amount of detail to triage and refer work appropriately.

- Safer Options team formed and given access – 2019
  - **Why were they added:** This team were given access to the TFD and its tools from the moment it was created. The plan was for the remit of the new team to require them to engage and understand young people at the edge of criminality/involved in exploitation, and so they needed a resource that gave them the understanding of who these CYP were.
  - **Implications for the TFD:** Expansion to this team created additional need for CCE and CSE related indicators and a link to the risk models to be presented alongside other data.
- Rollout to housing officers - early 2020, pre-COVID-19
  - **Why were they added:** The Housing Team were spending a lot of time getting in touch with children's services highlighting concerns about CYP. This created an impetus for access, and both the Housing Team and Children's Services requested it to create a more holistic view of risk and vulnerability across the services.
  - **Implications for the TFD:** There were no significant changes or adaptations made based on the introduction of these teams, as far as we have gathered thus far.
- Development and Rollout of TFE to schools – start October 2021
  - A detailed breakdown of the reasoning for the creation of the TFE and the expansion of TFD data to schools can be found later in the report, in the TFE section.

6b. Process maps of the TFD usage by different services

<u>Early Intervention</u>
Different teams within Early Intervention use the TFD. Below we outlined the main use cases:

Figure 21: Family In Focus process map

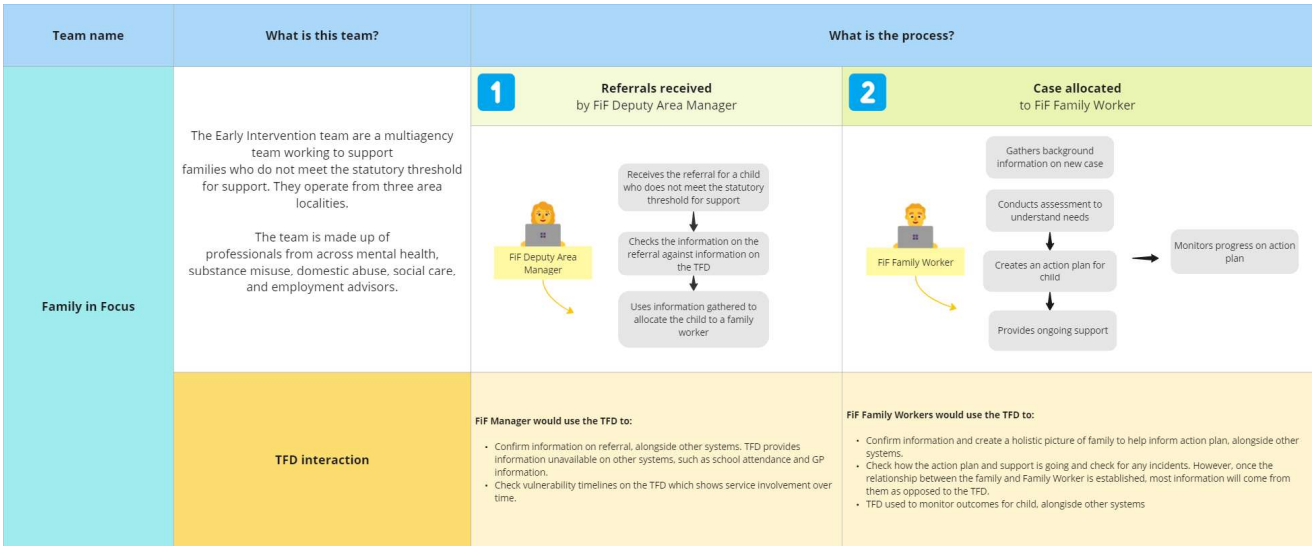


Figure 22: Youth Justice Service process map

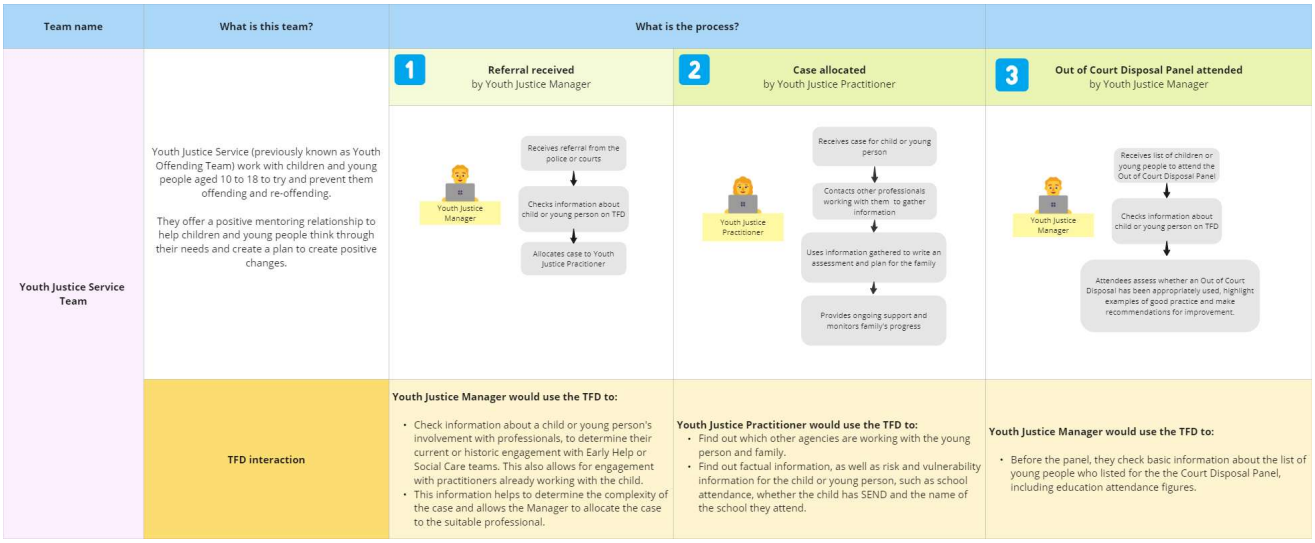


Figure 23: Education Inclusion Manager process map

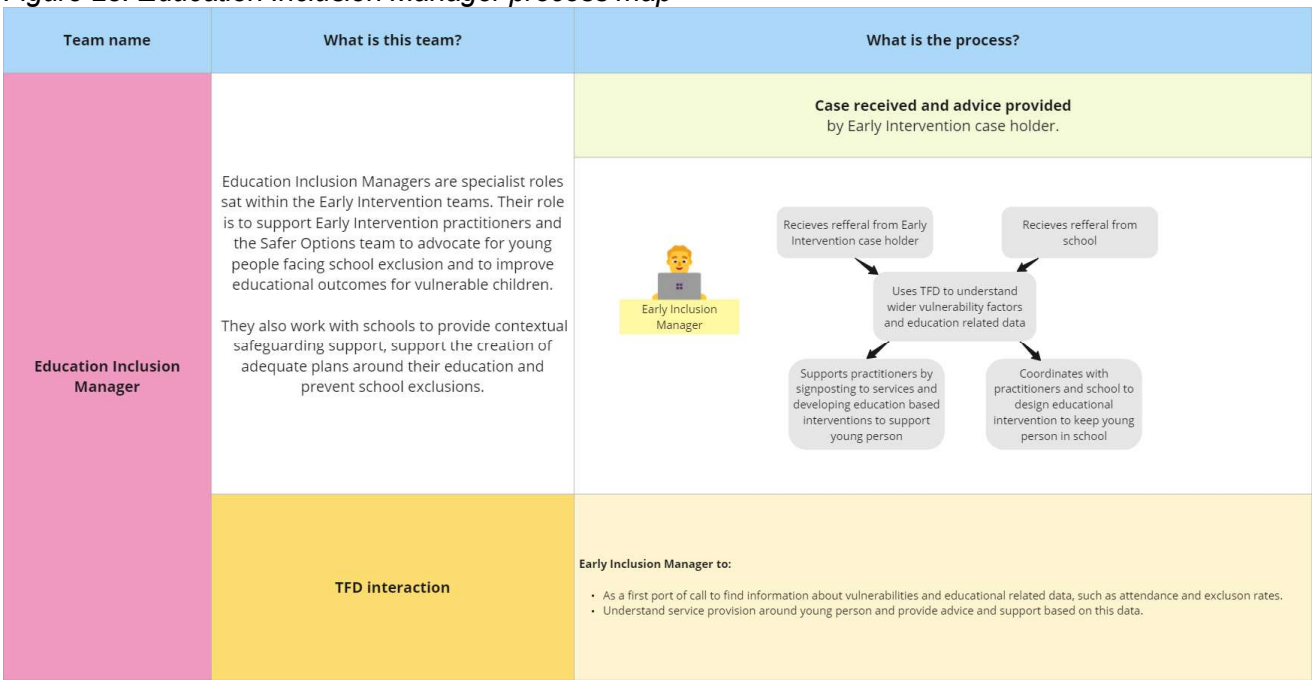
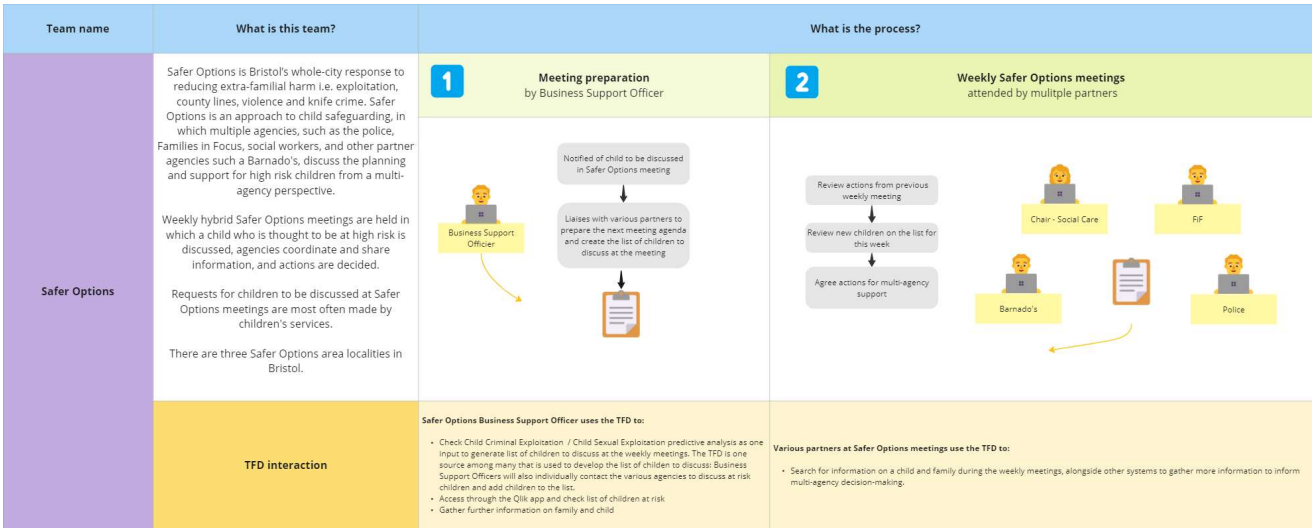
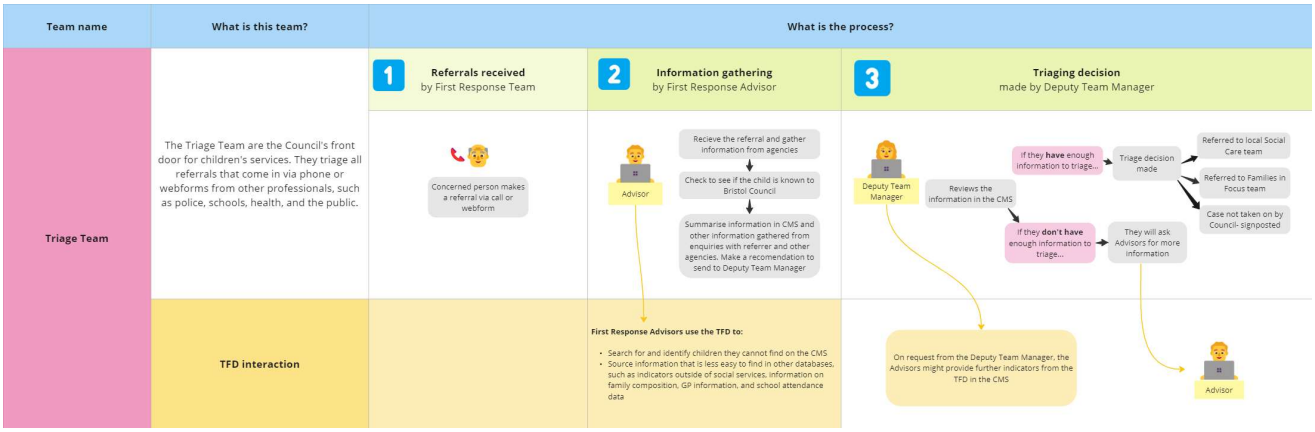


Figure 24: Safer Options approach process map



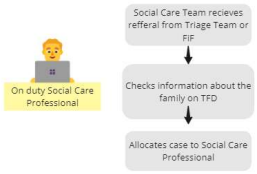
Triage:
Figure 25: Triage process map

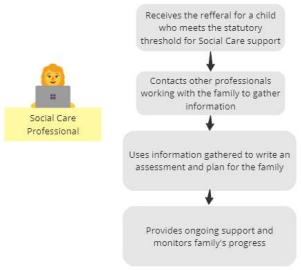


Social care:
Figure 26: Social Care process map

<table>
<tr><th>Team name</th><th>What is this team?</th><th colspan="2">What is the process?</th></tr>
<tr><td rowspan="2">Social Care</td><td rowspan="2">The Social Care Team are a team of social care professionals and managers who support families whose children have been assessment and placed either on a Child in Need Plan, Child Protection Plan or have become a Looked After Child, under the care of the Local Authority.

The team supports families to reduce risk, to enable families to step across to Early Help or case closure.</td><td>1 Case received
by on duty Social Care Professional

 
</td><td>2 Case Allocated
to Social Care Professional

 
</td></tr>
<tr><td>TFD interaction</td><td>On duty Social Care Professional to:

• Check information and history on a family and use this to allocate the case to a Social Care Professional within the team.</td><td>Social Care professionals would use the TFD to:

• Check basic information about families against their internal system, such as home addresses and school.
• Find out what other agencies are involved in working with the family.
• Find out information about extended family networks to identify potential suitable kinship carers.
• Identify risk and vulnerability information about the child or family held in the TFD</td></tr>
</table>

Appendix 7 – Targeted Risk Models: Technical Detail & Reason for Creation

The following appendix presents information on the technical workings of the targeted risk models, as well as a more detailed reflection on the reason for their creation.

The targeted risk models take a target cohort of people known to be experiencing, or who have experienced, criminal or sexual exploitation, or to have become NEET, depending on what the model is trying to identify, then they identify common factors present across individuals over a range of data points, creating a data 'blueprint'. The model is then turned on the wider population to identify young people who match the 'blueprint', assigning a vulnerability score. In doing so, the models do not account for any 'insulating factors' and only account for 'negative' data, or information that might increase risk, such as poor school attendance, records of crime, etc. This means that they rely on the professional case worker to account for other information or more contextual data not captured in the model. They are not designed to make decisions, they are to supplement the worker's understanding of vulnerability for that specific young person.

The biggest value provided by the models, from the point of view of the Insight Bristol team, is highlighting the middle and lower bracket of the high-risk cases to professionals, since the upper bracket is often already known, therefore highlighting cases that might have gone unnoticed or taken longer to notice.

7a. Technical Detail of Targeted Risk Model Functions

<u>The Not in Employment, Education or Training (NEET) Model</u>
The Child at Risk of Not being in Employment, Education or Training (NEET) Model was created based on the work that was already being done by schools around creating a Risk of NEET Index

(RONI), assessing and predicting risk of NEET for children and young people. This model uses the TFD data to create a more informed picture of an individual's situation, allowing decision-makers at schools and within the LA's post 16 education teams, to make more informed decisions to ensure that young people are in education or employment.

This model highlights forms of vulnerability in individuals based on a combination of the data from the TFD and school data. The user receives a numerical score for the individual they have looked up, as well as a descriptive paragraph briefly detailing the variables the score is summarising.

The NEET model is composed of three internal "sub-models" that feed into the final NEET model risk score:

- Attendance Model
- Attainment
- Supporting Families Model

Each of these is a logistic regression model, whose output is scaled to the range 0-100. Logistic regression is a well-known and long-standing method for modelling a binary outcome. Scores above 50 are considered potentially at risk on that outcome. The derived risk score is a combination of the output of the three sub-models. People are only assigned a risk score if they are considered potentially at risk by at least two of the three sub-models (at least one education model and the supporting family model). The goal is to make sure that the NEET Risk Model final result is focused on education related issues, balancing the cases highlighted by the Supporting Families sub-model. Additionally, internally within the models', different variables are weighed based on understanding of stronger predictive factors of vulnerability.

The model is trained with a cohort of around 1000 cases of NEET individuals to represent the target distribution in the input variables. These are then used to check the wider cohort for indicators that they might become NEET. They ask, "at the point this person became/was becoming NEET, what did they look like?" and then the model checks for other cases that share indicators. The goal of the model is to define a pre-NEET archetype that can then be used to provide support for children and young people before they leave education.

The model is refreshed weekly and retrained about every 18 months because the NEET cohort changes at the end of every school year or the following September. The internal code of the model is also updated, though this was last done two to three years ago. The objective of this maintenance is to keep the data as accurate and relevant as possible, to build credibility and trust with users.

NEET Model Inputs

Attendance Model

The inputs are 32 summary statistics (sum, mean, variance, slope) derived from indicators in the TFD over the last 6 and 12 months, including 12 variables for attendance in each month of the past year. Also included are data relating to educational attainment, children's social care, early help, DWP (financial data from people receiving universal credit), GP registrations, housing information (such as accessing homelessness support or being in rent arrears), police.

Attainment Model

The data are 11 variables that measure income deprivation and learning progress at school. These data include 2 variables that indicate special learning needs and free school meals. Deprivation measurement is based on the index of multiple deprivation of the child's neighbourhood. Learning progress is measured by standard tests (reading/writing/maths) given at key stages of the National Curriculum in England and Wales.

Supporting Families Model
The data are 140 variables that identify a child or family member of a child with an indication of vulnerability, and how recently this has been indicated. There are 35 vulnerability indicators including: criminal offences, anti-social behaviour, school exclusion or persistent absence, benefit cap, rent arrears, claims for free school meals, victim of domestic violence and abuse (according to the Niche database), access to drug or alcohol support.

The Child at Risk of Criminal Exploitation (CSE) and Child at Risk of Sexual Exploitation (CCE) Models

These models highlight forms of vulnerability in individuals drawing on consistent data from across the jurisdiction of Avon and Somerset Police, and while the exploitation models do use some indicators from the TFD, they are not based on the TFD in the same way the NEET model is. This is to allow the Police to profile children across the entire area they operate in, rather than only within Bristol.

The CSE & CCE Risk Models final scores show a numerical score for any individual who has scored between 50-100, with higher scores indicating higher vulnerability/risk. The user receives a numerical score for the individual they have looked up as well as a descriptive paragraph briefly detailing the variables the score is summarising. The model complements the other information presented alongside it on TFD dashboards.

The CSE/CCE models are developed and used by Avon and Somerset Police. These are 2 separate models, each one combines logistic and decision tree techniques. Each model outcome is a score between 0 and 100, which is considered ‘at risk’ if it’s above 50, in which case, the corresponding risk score is added to the TFD along with some explainer text which lists the indicators in the child’s data contributing to their score. The model is also used separately by the Police team responsible for reducing CCE/CSE, known as Operation TOPAZ.

An important advantage of a decision tree as the machine learning method, is that it has straightforward interpretation that can provide direct insights to help explain model predictions, for example which of the input variables were the most important drivers of a particular outcome. This is not shown in the TFD, but means the developer is able to check that the outputs make sense while developing the models. This advantage can outweigh gains in prediction accuracy of more sophisticated models.

CSE/CCE Model Inputs
The CCE model has 27 predictor variables, all drawn from the Niche database (the police’s crime recording system). The variables are counts of occurrences within certain time periods where a child is reported as missing, or as the victim or offender in domestic abuse, violence, or public order offence, or sexual offence, or as the victim of a vehicle offence. The time periods are 6, 12, 24, 30, and 60 months preceding the current day. However, as we discovered in our fieldwork, it is unclear what the 27 variables are and how these are weighted as part of the model.

The CSE model is trained using the Barnardos Against Sexual Exploitation (BASE) cohort of around 1000 children known to have been sexually exploited as the at risk of CSE class, alongside a set of children assumed not to be at risk, taken from the Police database, which includes all under 18s in Avon and Somerset.

The CCE model is trained using the Barnardos ROUTES (a programme designed to reduce CCE) cohort as the at risk of CCE class, and a set of children assumed not to be at risk of criminal exploitation, taken from the Police database, which includes all young people under 18 years old in Avon and Somerset.

Targeted Risk Model Outputs (NEET, CSE & CCE)
In addition to the score provided by the models summarising the risk factors an individual case is subject to, the models also produce text descriptions of what the scores mean to make the information more accessible and easier to understand for frontline practitioners.

Figure 27: Text description of risk score results from the CSE and CCE models

Indicator	Indicator Date	Value	Notes
Child Risk of Sexual Exploitation	24 Feb 2020	87.900	This young person is vulnerable to Child Sexual Exploitation (CSE). They have a CSE risk flag in Police systems. In the last year they have have been linked to CSE-related Police reports; they have gone missing 19 times with concerns that they were at risk of CSE during the missing periods; they are or have been open to Families in Focus; they have been vulnerable due to being involved in domestic abuse; individuals in their family have gone missing. They are linked to other young people who are also vulnerable to CSE and to subjects aged over 18 who are linked to CSE-related Police reports.
Risk of Child Criminal Exploitation	25 Feb 2020	72.000	This young person is vulnerable to Child Criminal Exploitation (CCE). They are linked to CCE-related Police reports and Police problem-solving reports; they are linked to people who are linked to County Lines-related Police reports; they are linked to Police intelligence relating to acquisitive crime; they are involved in criminality with people aged over 18; they have gone missing 78 times with concerns that they were vulnerable to gang involvement during the missing periods; they are linked to other young people who are also vulnerable to CCE and to people aged over 18 who are linked to CCE-related Police reports.

7b. Why were the Targeted Risk models created?

The driving idea of having a tool that could provide predictive analysis led to the creation of the three risk models that were developed in Bristol.

The Not in Employment, Education or Training (NEET) Model
This model was originally built as a proof of concept for a predictive model that used the TFD to help inform decision-making by frontline staff in Bristol, primarily safeguarding leads in schools. At the time, leaders of the Insight Bristol team were looking to propose the creation of a predictive model schools had already developed, the RONI index, which was used to find Children and Young People (CYP) at risk of becoming NEET. The index was a crude risk matrix and the Insight Bristol team felt that, with access to all the social data already held within the TFD, they could develop a far more sophisticated and useful model. The proposed model would not predict if CYP would become NEET but rather highlight risk factors. This was therefore easier to 'sell' to other stakeholders across the council, because it was seen as further developing a tool that was already in use by schools.

Additionally, while it had not been the first subject considered for the development of a predictive model using TFD data, the NEET model worked in a less sensitive space and therefore had fewer barriers to its development. People within Bristol City Council and schools were more willing to engage with the model developers to explore its uses and support them, when the Insight Bristol team wanted to check/compare the lists that the RONI index was creating and the lists that the new NEET model created.

The Child at Risk of Criminal Exploitation and Child at Risk of Sexual Exploitation Models
To help gather support and funding, the Insight Bristol and Police teams looked for a topical, publicly recognised challenge to try and tackle with their envisioned predictive model. This coincided with the Rotherham Public Inquiry into child sexual exploitation, which led to the focus of the Bristol models on the criminal and sexual exploitation of young people.

In 2016, the Bristol Safeguarding Children Board (BSCB) published a Serious Case Review for Operation Brooke, a large-scale police investigation into the sexual exploitation of children in Bristol. The review published a series of findings which highlighted several national, institutional and operational failings. Embedded in their areas for improvement lay a need to move to a proactive, as opposed to reactive, response to Child Sexual Exploitation (CSE) and CCE. It was therefore decided that the Insight Bristol team would utilise predictive analytics to identify potential victims and perpetrators of CSE and CCE.

It was important to design a response to simply and efficiently give all the key agencies the relevant outputs from the model, whilst simultaneously aiming to mitigate the areas for improvement outlined by the BSCB. The deployment of the model was therefore designed to meet a number of targets. These ranged from alerting key agencies about risky individuals who are not currently being worked with, to aiding commissioning and service planning. The focus was on the model supporting decisions and creating more space for conversation, while giving frontline workers more information so they could pair it with their professional knowledge to make case decisions.

The goal was to not just highlight the most at risk cases but bring forward the cases in the medium ranges of risk, since they would be most likely to need support but still be unnoticed.

Appendix 8 – Summarised Elements of the TFD: Description, Users, and Reason for Creation

Figure 28: Summarised Elements of the TFD: Description, Users, and Reason for Creation

Name of Product	Description	Users	Reason for Creation
Think Family Database (TFD) front end & back end	A 'front end' for the database built in Microsoft's Sequel Server Reporting Services (SSRS) with a practitioner view, accessed by teams within the Local Authority. Users are able to see profiles for individuals and their families through different views, outlining what indicators are present, where an individual has been identified by one of the targeted risk models and who is working with the family. Work is currently being undertaken to redesign this front end in PowerBI.	Available to Bristol City Council staff involved in safeguarding and promoting the wellbeing of children and families. Around 5000 searches performed each month across an average of 120 users.	
Targeted Risk Models NEET, CCE & CSE	**The NEET Model** This is a predictive model developed by the Insight Bristol team based on TFD data. Its	**The NEET Model** TFE users including schools. The model results are available on	To develop models that could help carry out predictive analysis to help inform decision-

	goal is to highlight Children and Young People at risk of becoming NEET (measured at 11 and 16 years old). The output per Children and Young Person is both a numerical score and a descriptive paragraph highlighting key issues and score reasoning. **The CCE and CSE Models** Predictive models developed by the Insight Bristol and Police teams. Currently uses Adults Social Care data to produce a risk score of Child Criminal Exploitation (CCE), or Child Sexual Exploitation (CSE). The output per Child and Young Person is both a numerical score and a descriptive paragraph highlighting key issues and score reasoning.	the TFD Dashboard so users of the dashboard like the FiF team can and do use it to inform resource allocation and case triaging. **The CCE and CSE Models** Police, staff involved in reducing exploitation, including the Safe Options teams, users of the Qlik app, since the model's results are displayed here as well.	making for frontline staff, and better utilise the data gathered in the TFD to do more preventative work, following the direction of Early Help practices.
Think Family Education (TFE) dashboard	An abridged version of the TFD front end, built in PowerBI, designed for designated safeguarding leads and pastoral staff within educational settings. This was rolled out over the 2022/2023 academic year and is now live in 60 educational settings.	Designated safeguarding leads, their deputies and other relevant pastoral staff within educational settings (e.g., primary, secondary, academies, special schools, pupil referral units). Now live in 82 educational settings with an average of 100-150 searches per day in Feb 2023, across 63 users who accessed in Jan/Feb.	To support decision-making in schools around safeguarding and support, since CYP spend most of their time in schools and therefore it is key to improve this environment to support positive outcomes. The TFE would provide a full quick picture of vulnerability at a school.
Think Family Notification (TFN)	The TFN is a system that creates email notifications sent to lead professionals working on cases where an event has triggered a notification, to let the lead professional know to check the TFD for further information.	Lead professionals who are holding a case related to a CYP and Adults are signed up to the TFN.	The goal was to streamline the old process by which a case worker would find out if a CYP case they are working with was subject to increased risk or was isolating. To try and give professionals the information of an incident happening sooner than they would have otherwise known.

The Strategic & Aggregated Views and the Qlik Apps	**Strategic apps built in Qlik** Data from the TFD is aggregated, anonymised and presented in a range of Qlik apps to support strategic decision making and resource allocation. **Exploitation app** The outputs of the predictive risk models are fed into a Qlik app that includes supplementary useful information such as schools attended and relevant police information. **Police Safeguarding App** Data from the TFD is shared with Avon and Somerset Police and fed into a safeguarding app, built in Qlik Sense, for the Lighthouse Safeguarding Unit (LSU), the team in the police responsible for handling child safeguarding cases.	**Strategic apps built in Qlik** The Safe Options Team. Managers and commissioners within children's services. **Exploitation app** Staff involved in reducing exploitation, i.e., the Safer Options teams, but others across children's services can access on a case-by-case basis. Accessed 47 times in January 2023. **Police Safeguarding App** Limited to staff within the LSU.	The goal of the views and apps is to create an accessible format for the appropriate information to reach the correct audience to inform strategic commissioning and reporting. The views and apps are created either by request from a team using or with prospects to use TFD data, or through exploratory development work carried out by the Insight Bristol team based on existing knowledge of needs and processes in teams using the TFD and its associated tools.

Appendix 9 - Detailed CBA methodology

9.a. Scope summary

The cost-benefit analysis (CBA) aims to evaluate the historical costs associated with the TFD and its related products, compared to their monetisable benefits. Bristol City Council supports the costs linked to these projects, while the benefits extend to both Bristol City Council staff, and users within schools for TFE. The time frame for the CBA spans from its inception in 2015 to 2023.
Costs encompass initial tool development, maintenance, and ongoing development expenses, including technical enhancements, adding new datasets, and IG review costs.
Benefits only include time saved from using the TFD/TFE. Effectiveness benefits were omitted due to challenges in obtaining outcome data and the unreliability of attributing such benefits to the TFD / TFE. Consequently, this cost-benefit analysis accounts for only a portion of the overall benefits. Our calculations focus on cost of an hour of work as a proxy for financial value. However, in reality, the hours saved do not necessarily translate to fewer full-time equivalents (FTE) or direct bankable cost savings.
There are a number of constraints on our analysis, which are detailed in the relevant sections and that we recommend be born in mind when considering our findings.

9.b. Historical costs

Method and caveat:

Scope: Costs encompass initial tool development, maintenance, and ongoing development expenses, including technical enhancements, adding new datasets, and IG review costs.

The following method has been applied to ascertain the cost of each element:

- We asked leaders within the Insight Bristol team to outline who was involved in the development of each element, how much of their time they were working on the element, and what 'grade' they were on the Bristol pay scale for the respective years.
- The salaries outlined in the 2021/22 pay grades are not inclusive of pension contributions and other associated oncosts such as national insurance contributions. The 2017/18 copy does include this, and on average these oncosts amount to a 33% addition to the published salary. Where applicable, we have therefore increased the salary costs for each individual by 33% to reflect these costs to the organisation.
- As we do not know at which spinal point in the pay band an individual sits, we have taken each individual to be at the middle of their respective pay bands.

Caveats in respect of costings:

- Many of these systems were first developed as early as 2015. As such it has been difficult to locate and gain access to reliable, historic financial information. We have therefore had to rely on the memory of individuals as to how much was spent on some of the earlier developed elements.
- Many of these systems were developed by individuals as a part of wider roles; staff within the Insight Bristol team do not complete time sheets allocating their time to individual projects/products, so time spent by staff on any element has been estimated by the developers and managers within the Insight team.
- It is incredibly difficult to ascertain the time spent by individuals outside of the immediate team that was crucial for development of the various tools. For example, each tool is underpinned by a rigorous information governance approach which has been developed iteratively through engagement across the Insight Team, the LA's Information Governance team, Bristol City Council technical teams and the information governance teams of partner organisations over a series of years. It should be considered that the 'true' cost of these elements is likely to be higher than the cost stated below.
- Some of the costed elements are reliant on the existence of previously costed elements, i.e. you cannot develop the TFE without the existence of the TFD.

Initial development costs

TFD development cost (2015)

	Total cost / year	Time spent / year	Year cost incurred
SQL Consultant	£70,000	6 months	2015
LA Information Analyst	£49,812	12 months	2015
Police Data Scientist	£24,906	6 months	2015
Business Relationship Manager	£36,041	12 months	2015

Total development cost TFD	**£180,759**		

TFE development cost (2021)

	Total cost / year	Time spent / year	Year cost incurred
Business relationship manager	£41,209	12 months	2021
Education inclusion officer (employed by school)	£18,000	6 months	2021
BI Developer	£12,819	3 months	2021
Total development cost TFE	**£72,028**		

TFN development cost (2022)

	Total cost / year	Time spent / year	Year cost incurred
Senior Information Analyst	£2,412	5 months	2022
Information Analyst	£1,122	3 months	2022
Total development cost TFN	**£3,534**		

CCE Risk model development cost (v1 2017, v2 2020)

	Total cost / year	Time spent / year	Year cost incurred
Police BI Developer (v1)	£19,642	5 months	2017
Police BI Developer (v2)	£13,163	3 months	2020
Total development cost CCE	**£32,805**		

CSE Risk model development cost (v1 2017, v2 2020)

	Total cost / year	Time spent / year	Year cost incurred
Police BI Developer (v1)	£19,642	5 months	2017
Police BI Developer (v2)	£13,163	3 months	2020
Total development CSE	**£32,805**		

NEET Risk Model (v1 2018, v2 2022)

	Total cost / year	Time spent / year	Year cost incurred
Police BI Developer (v1)	£20,074	5 months	2018
Senior Information Analyst (v2)	£4,936	1 month	2022

Total development cost NEET	**£25,010**		

Maintenance costs

TFD maintenance cost (2015 onward)

	Total cost / year	Time spent / year	Year cost incurred
Data engineer	£4,828	0.1 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Data analyst / Relationship manager	£5,384	0.1 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Senior data analyst	£5,924	0.1 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Server costs	£8,000		2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Cost of maintenance per year TFD	**£24,135**		

TFE maintenance cost (2021 onward)

	Total cost / year	Time spent / year	Year cost incurred
Data analyst	£10,255	0.2 FTE	2021, 2022, 2023
Cost of maintenance per year TFE	**£10,255**		

Ongoing costs for technical development, IG review, and new data sources

TFD ongoing development cost (2015 onward)

	Total cost / year	Time spent / year	Year cost incurred
Data engineer	£14,483	0.3 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Data analyst / Relationship manager	£16,151	0.3 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Senior data analyst	£17,771	0.3 FTE	2015,2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Cost of ongoing development per year TFD	**£48,405**		

TFE ongoing development cost (2021 onward)

	Total cost / year	Time spent / year	Year cost incurred
Data analyst	£10,255	0.2 FTE	2021, 2022, 2023

Cost of ongoing development per year TFE	**£10,255**		

Consultancy cost

	Total cost / year	Time spent / year	Year cost incurred
IG consultant	£5,000	10 days per year	2019, 2021, 2023
Cost of ongoing development per year TFE	**£5,000**		

9c. Historical benefits

Method:

Scope: the CBA exclusively considers time saved on tasks attributable to TFD or TFE. Effectiveness benefits, which, based on qualitative research, are the main benefits, could not be accounted for due to challenges in obtaining outcome data and the unreliability of attributing such benefits to the TFD / TFE. We opted to concentrate on efficiency for a more robust calculation, acknowledging it represents only a portion of the overall benefits.

The historical benefits for both the TFD and TFE in each year are calculated as follows:

- we estimated the number of hours saved per month per active users (see assumptions for time save below)
- we multiplied this by 12 to have the number of hours saved per year per active users
- we multiplied this by the number or active users that year to have the total number of hours saved that year (see assumptions for active users below)
- we multiplied this by the monetary value of one hour of total salary cost that year (see detail below)

Main caveats:

Our approach uses the cost of an hour of work as a proxy for the value of benefits. However, in reality, the hours saved do not necessarily translate to fewer full-time equivalents (FTE) or direct cost savings.
Focusing solely on time-saving overlooks other benefits, like effectiveness, capturing only a fraction of total benefits.
Without a baseline, assessing TFD /TFE's time-saving impact is challenging.
Estimating previous years' time saved relies heavily on 2023 survey data, potentially diverging from actual past savings due to lack of historical data.

Historical number of active users

Bristol City Council provided usage data for the TFD from 2019 to 2023, enabling us to identify active users each year as individuals who accessed the TFD at least once during that period.

For the years 2015 to 2018, detailed usage data was unavailable. However, Bristol City Council provided the total number of enabled users each year. To estimate the number of active users for this period, we assumed a consistent percentage of active users (51%) as observed in the period 2019 to 2023. We utilised this assumption to calculate the number of active users based on the number of enabled users each year.
Based on this, we got the number of TFD active users per year, as per below:

TFD historical active users:

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of active users	**24**	**90**	**171**	**238**	**300**	**296**	**430**	**409**	**460**

Bristol City Council provided the number of active users of the TFE in 2023, which is **294**.

Estimation of time saved per month by active users of the TFD

To account for the uncertainty in the estimation of time saved from the TFD, we have modelled 3 scenarios, the third scenario being the base scenario as this is the one with most nuances.

Scenario 1: This scenario relies solely on survey data (58 answers) to estimate time saved for 2023, assuming it remains constant over time. The calculated time saved per month using this method is **1.46 hours**.

Scenario 2: To improve our estimation, we have included time saved estimates provided by 4 individuals we interviewed who provided quantified time saved. Combining these interview responses with the 58 survey responses, we calculated the average time saved based on the 62 total responses (58 surveys + 4 interviews), resulting in an average time savings of **1.88 hours.**

Scenario 3 (base scenario): To improve the historical estimation of time saved, instead of assuming a constant time saved per user over time, we recognise that variations in usage over previous years may have influenced their perception of time saved. To enhance accuracy in estimating time saved for preceding years, we calculated a usage intensity coefficient by dividing the number of page loads per active user in a given year by the number of page loads per active user in 2023. We then multiplied the time saved calculated from the survey and interviews (1.88 hours) by this coefficient to obtain the historical time saved, as outlined below:

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
Page load / active user	NA	NA	NA	NA	164	166	111	139	99
Intensity coefficient	1	1	1	1	1.7	1.7	1.1	1.4	1
Hours saved / month	**1.88**	**1.88**	**1.88**	**1.88**	**3.10**	**3.16**	**2.10**	**2.64**	**1.88**

Survey question design and mapping

Respondents were initially asked, 'How does the Think Family Database impact the amount of time you spend on tasks?'

If they answered, “It saves me time” or “It increases the amount of time I spend on tasks”, they were subsequently presented with options indicating a range of time spent.

We assigned a specific number of hours to each answer according to the logic outlined below:

Possible answers	Follow on questions (grey) and answer options (italic)	Mapped hours saved
It does not change the amount of time I spend on tasks	NA	0
It saves me time	Approximately how much time, if any, do you estimate the Think Family Database saves you per month?	
	Up to 30 mins	0.5
	30 mins to 2 hours (less than half a day)	1.25
	3-4 hours (about half a day)	3.5
	5-8 hours (about one working day)	6.5
	8-15 hours (1-2 working days)	11.5
	15+ hours (more than 2 working days)	18.75
	Blank	0
It increases the amount of time I spend on tasks	Approximately how much time, do you estimate the Think Family Database adds to the time you spend on tasks per month?	
	Up to 30 mins	-0.5
	30 mins to 2 hours (less than half a day)	-1.25
	3-4 hours (about half a day)	-3.5
	5-8 hours (about one working day)	-6.5
	8-15 hours (1-2 working days)	-11.5
	15+ hours (more than 2 working days)	-18.75
	Blank	0

Estimation of time saved per month by active users of the TFE

The estimation of time saved from the TFE relies solely on survey data (61 answers).

We applied the same survey question design and mapping as for the TFD (see section above).

The calculated time saved per month using this method is **1.27 hours**.

Estimation of the monetary value of one hour of time saved for TFD users

The monetary value of 1 hour saved is estimated based on the hourly salary rate.

Bristol City Council provided pay band data per role for 2023, to which we added 33% to cover national insurance, pension contributions, and benefits, thereby estimating the total cost for the council per role.

Assuming a standard workweek of 38.5 hours and 231 workdays per year, we calculated the cost per hour per role.

Next, we used the usage data to determine the distribution of user categories across different pay bands. Using this information, we computed a weighted average salary to represent the value of 1 hour saved. This calculation involved averaging the salaries per role, weighted by the proportion of each role among the active users from 2019 to 2023. We then arrive to an hourly salary per active users of **£24.17**

Salary per hour per role:

Role	Average annual salary	NI and pension contribution (33%)	Total cost for council	Average number of worked days in a year	Average number of working hours per day	Salary per hour	% of user population
Analyst	£24,792	£8,181	£32,973	231	7.7	£18.5	19%
Manager	£44,184	£14,581	£58,765	231	7.7	£33.0	24%
Social Worker	£29,734	£9,812	£39,546	231	7.7	£22.2	42%
other	£29,734	£9,812	£39,546	231	7.7	£22.2	15%

Since this estimation relies on 2023 pay band data, we adjusted it for wage inflation in preceding years using ONS UK average weekly real earnings. We calculated the average weekly earnings for a specific year and then determined the wage deflator coefficient for that year by dividing the average weekly earnings of that year by the average weekly inflation for 2023, as per below:

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
Average weekly earning*	453	464	474	488	505	516	542	571	610
Wage inflation deflator	**0.74**	**0.76**	**0.78**	**0.80**	**0.83**	**0.85**	**0.89**	**0.94**	**1.00**

*Based on ONS average weekly earnings as of December 2023

Estimation of the monetary value of one hour of time saved for TFE users

To estimate the average salary cost of school users, we analysed the survey responses to identify the roles of active users and their representation in the total number of responses. Using public salary sources as of 2023 for these roles, we estimated the average salary per role. We then calculated a weighted average salary by averaging the salaries across different roles, weighted by the proportion of survey respondents. Consequently, we determined an hourly salary per active user of **£35.26**.

Role	Average annual salary	NI and pension contribution (33%)	Total cost for council	Average number of worked days in a year	Average number of working hours per day	Salary per hour	% of survey respondents
DSL or deputy DSL	£33,500	£11,055	£44,555	231	7.7	£25	51%
Head teacher	£92,000	£30,360	£122,360	232	7.7	£68	16%
Assistant head teacher	£61,500	£20,295	£81,795	233	7.7	£46	18%

Pastoral and other	£30,000	£9,900	£39,900	234	7.7	£22	15%

The benefits of TFE only occurred in 2023, so no wage inflation adjustment was needed.

9d. Inflation and time value adjustment

Time value adjustment to 2023 value

Cost and benefits were adjusted to 2023 value using the Green Book social time preference rate (STPR) of 3.5%, on the basis of which we calculated a time value coefficient for each year, calculated as follows for any given year n in the past: (1+3.5%)^n.

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
(STPR)	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Time coefficient to 2023	**1.32**	**1.27**	**1.23**	**1.19**	**1.15**	**1.11**	**1.07**	**1.04**	**1.00**

Inflation adjustments to 2023 value

Costs and benefits were adjusted to 2023 values using a GDP deflator. The source of the deflator is from the latest Gov UK GDP deflators at market prices and money GDP in March 2024, available at https://www.gov.uk/government/collections/gdp-deflators-at-market-prices-and-money-gdp .

We calculated a GDP coefficient adjustment for each year, denoted as 'n', as: (price index for year 2023) / (price index for year 'n').

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
Index 2023 = 100	78.21	79.74	81.22	82.78	84.53	89.02	88.73	93.29	100.00
GDP Inflation coefficient to 2023 value	**1.28**	**1.25**	**1.23**	**1.21**	**1.18**	**1.12**	**1.13**	**1.07**	**1.00**

9e. Total cost calculation

Years	2015	2016	2017	2018	2019	2020	2021*	2022	2023	Total
Total initial development	£180,759	£0	£39,284	£20,074	£0	£26,326	£72,028	£8,470	£0	£346,941
Total maintenance	£24,135	£24,135	£24,135	£24,135	£24,135	£24,135	£34,390	£34,390	£34,390	£247,979
Total ongoing development	£48,405	£48,405	£48,405	£48,405	£53,405	£48,405	£63,660	£58,660	£63,660	£481,406
Total cost	£253,298	£72,539	£111,823	£92,613	£77,539	£98,865	£170,077	£101,519	£98,049	£1,076,326
Time coefficient	1.32	1.27	1.23	1.19	1.15	1.11	1.07	1.04	1.00	
GDP inflation coefficient to 2023 value	1.28	1.25	1.23	1.21	1.18	1.12	1.13	1.07	1.00	
Total costs adjusted for time & inflation	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**

*Development of the TFE in 2021 driving initial development cost that year

9f. Total benefit calculation

Scenario 1 (using survey data only)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total hours saved TFD	424	1,573	2,987	4,153	5,245	5,175	7,518	7,150	8,042	42,267
Total £ saved TFD	£10,251	£38,015	£72,186	£100,377	£126,754	£125,064	£181,681	£172,808	£194,357	£1,021,494
Total hours saved TFE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,497	4,497
Total £ saved TFE	£0	£0	£0	£0	£0	£0	£0	£0	£158,566	£158,566
Total £ saved TFD & TFE	£10,251	£38,015	£72,186	£100,377	£126,754	£125,064	£181,681	£172,808	£352,923	£1,180,061
Wage inflation deflator	0.74	0.76	0.78	0.80	0.83	0.85	0.89	0.94	1.00	
Time coefficient	1.32	1.27	1.23	1.19	1.15	1.11	1.07	1.04	1.00	
GDP inflation coefficient to 2023 value	1.28	1.25	1.23	1.21	1.18	1.12	1.13	1.07	1.00	
Total benefit adjusted for time & inflation	**£12,820**	**£46,111**	**£84,831**	**£115,225**	**£142,564**	**£131,787**	**£195,067**	**£179,648**	**£352,923**	**£1,260,977**

Scenario 2 (using survey and interviews data)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total hours saved TFD	547	2,029	3,852	5,357	6,765	6,674	9,696	9,222	10,372	54,514
Total £ saved TFD	£13,222	£49,030	£93,102	£129,461	£163,481	£161,302	£234,323	£222,880	£250,672	£1,317,472
Total hours saved TFE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,497	4,497
Total £ saved TFE	£0	£0	£0	£0	£0	£0	£0	£0	£158,566	£158,566
Total £ saved TFD & TFE	£13,222	£49,030	£93,102	£129,461	£163,481	£161,302	£234,323	£222,880	£409,238	£1,476,039
Wage inflation deflator	0.74	0.76	0.78	0.80	0.83	0.85	0.89	0.94	1.00	
Time coefficient	1.32	1.27	1.23	1.19	1.15	1.11	1.07	1.04	1.00	
GDP inflation coefficient to 2023 value	1.28	1.25	1.23	1.21	1.18	1.12	1.13	1.07	1.00	

Total benefit adjusted for time & inflation	**£16,535**	**£59,471**	**£109,411**	**£148,612**	**£183,873**	**£169,972**	**£251,588**	**£231,701**	**£409,238**	**£1,580,401**

Scenario 3 (using survey and interview data and a usage coefficient adjustment - base scenario)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total hours saved TFD	547	2,029	3,852	5,357	11,165	11,207	10,828	12,972	10,372	68,329
Total £ saved TFD	£13,222	£49,030	£93,102	£129,461	£269,828	£270,846	£261,680	£313,503	£250,672	£1,651,342
Total hours saved TFE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,497	4,497
Total £ saved TFE	£0	£0	£0	£0	£0	£0	£0	£0	£158,566	£158,566
Total £ saved TFD & TFE	£13,222	£49,030	£93,102	£129,461	£269,828	£270,846	£261,680	£313,503	£409,238	£1,809,909
Wage inflation deflator	0.74	0.76	0.78	0.80	0.83	0.85	0.89	0.94	1.00	
Time coefficient	1.32	1.27	1.23	1.19	1.15	1.11	1.07	1.04	1.00	
GDP inflation coefficient to 2023 value	1.28	1.25	1.23	1.21	1.18	1.12	1.13	1.07	1.00	
Total benefit adjusted for time & inflation	**£16,535**	**£59,471**	**£109,411**	**£148,612**	**£303,484**	**£285,405**	**£280,959**	**£325,912**	**£409,238**	**£1,939,027**

9d Cost vs benefits summary

Scenario 1 (using survey data only)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Cost per year	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**
Benefits per year	£12,820	£46,111	£84,831	£115,225	£142,564	£131,787	£195,067	£179,648	£352,923	**£1,260,977**
Benefits – Costs	-£413,677	-£69,628	-£84,409	-£17,646	£37,307	£8,649	-£10,258	£67,022	£254,874	**-£227,766**
Benefit / cost	3%	40%	50%	87%	135%	107%	95%	160%	360%	**85%**

Scenario 2 (using survey and interviews data)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Cost per year	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**

Benefits per year	£16,535	£59,471	£109,411	£148,612	£183,873	£169,972	£251,588	£231,701	£409,238	**£1,580,401**
Benefits – Costs	-£409,963	-£56,268	-£59,829	£15,741	£78,615	£46,835	£46,263	£119,075	£311,189	**£91,658**
Benefit / cost	4%	51%	65%	112%	175%	138%	123%	206%	417%	**106%**

Scenario 3 (using survey and interview data and a usage coefficient adjustment - base scenario)

Years	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Cost per year	£426,497	£115,739	£169,240	£132,871	£105,257	£123,138	£205,325	£112,627	£98,049	**£1,488,743**
Benefits per year	£16,535	£59,471	£109,411	£148,612	£303,484	£285,405	£280,959	£325,912	£409,238	**£1,939,027**
Benefits – Costs	-£409,963	-£56,268	-£59,829	£15,741	£198,227	£162,267	£75,635	£213,285	£311,189	**£450,284**
Benefit / cost	4%	51%	65%	112%	288%	232%	137%	289%	417%	**130%**

Appendix 10 – Technical Advisory Group membership

The members of the group include:

- **Rob Procter, University of Warwick -** Professor of Social Informatics and Co-chair of the AI and Human Centred Computing theme in the Department of Computer Science at the University of Warwick.
- **Nikki Luke, University of Oxford -** Research Fellow at the Rees Centre, University of Oxford.
- **Chris Dent, University of Edinburgh -** Professor of Industrial Mathematics at the University of Edinburgh. Helps directs the Statistical Consultancy Unit at University of Edinburgh leading the evaluation of targeted risk models.
- **Ben Kelly, CDEI** – Senior Policy Advisor, Centre for Data Ethics and Innovation (now called Responsible Technology Adoption Unit).