



Annual Report









Introduction

Welcome to the Data for Children Collaborative with UNICEF's very first annual report! We are really excited to share our successes from our first year in action, as well as some of the lessons we have learned along the way. This year has certainly been busy for us – not only have we been working hard to set up our governance framework, but we have also been building our network, hosting workshops and events (across multiple time zones!) and getting started on a variety of projects.

The global pandemic has made 2020 an unforgettable year – and one where data has been at the forefront of everyone's minds. Experiencing first hand the importance of having access to reliable and high quality data in order to make life-changing decisions has been an inspiration for us here at the Collaborative. We will continue to work hard to harness the power of data to make a real positive impact on children's lives.

What's inside...

Hear from our board members.

We asked some of our key board members to reflect on the Collaborative one year on.

What have we been up to?

- The Numbers
- Data Types
- Global Impact
- Partners
- Awards
- Social Media

- Success Measures
- Responsible Innovation
- Ethics
- Impact Collaborations
- Project Summaries
- Lessons Learned

Making an impact in our first year.

Here's a snapshot of some of our proudest achievements this year. We hope you enjoy exploring the report and finding out more about the work we do here at the Data for Children Collaborative with UNICEF.



With special thanks to our partners:





Part of the Edinburgh & South East Scotland City Region Deal







A Year's Overview...

WHERE ARE WE NOW?



Alex Hutchison

Director, The Data for Children Collaborative with UNICEF

One year on from the launch of a shared agreement between UNICEF, the Scottish Government and the University of Edinburgh, I'm delighted with the progress that we have made in a truly collaborative way. We have eight live projects and one completed project across a broad spectrum of themes, geographically spread across the globe but also with some focused specifically on Scotland. The teams of people working on these projects bring expertise from a range of sectors. We have been able to learn so much from how The Data Lab has created collaborative projects, but we have also co-created a number of tools within our operating model, through working with our partners, to be able to innovate in a responsible way.

The opportunity that exists to make a difference to children's lives is becoming a reality.

And the most encouraging thing about the last year has been the will to support making the most of this opportunity. To good things, come good people. The vision of these three partners and the way we want to deliver impact is a good thing, and the engagement that we have had from stakeholders far and wide has shown the best of people. Personally I feel proud every day of the why, the what and the how of what we're working on. And this time next year, I can't wait to tell more stories of the good that has been done from our partnership.

Stefaan Verhulst

Co-Founder and Chief Research and Development Officer, GovLab Steering Board Chair

Addressing today's most pressing challenges for children requires new approaches to work across sectors and to tap into the distributed expertise and data sets that could make a difference. In its first year of existence, the Data for Children Collaborative has worked towards and provided the proof of concept on how to collaboratively leverage data, networks and expertise of all partners in a complementary and reinforcing manner: a great synergy of assets and strengths.

Albert King

Chief Data Officer for Scotland, Scottish Government Board Member

You might expect me to say that the Data for Children Collaborative is helping us to address some of the challenges facing children here in Scotland and around the world. And it is. But in doing this, it's been amazing to see how the Collaborative has been able to assemble diverse teams from around the world involving governments, academics and international bodies – a coalition of the willing all motivated to make a real difference. We've learnt a huge amount about what it takes to make this happen successfully and at scale and that's something we can take back into how we bring together communities of expertise around complex challenges. This is an inspiring example of how much more we can achieve when we come together and I'm delighted that Scotland has been able to play a part as an open and connected nation determined to make a positive contribution internationally.

If we are to have the positive impact for children we aspire to it is critical that we maintain and build trust in the way we use data. The ethical framework that the collaborative has developed bakes ethics into every project from inception and is therefore vital. I think it also helps others to see how to make ethics part of and not just an adjunct to data driven projects, something that data scientists can learn from as we work to unleash trustworthy use of data for public benefit.

Lucinda Rivers

Head of UNICEF UK in Scotland Board Member

UNICEF works in over 190 countries and territories to uphold children's rights. We are here to ensure that every child from early childhood through to adolescence has equal opportunities and the chance to fulfil their potential.

Of course this is very challenging and has been even more difficult in 2020. Children are the hidden victims of the COVID-19 pandemic and are now more affected by malnutrition, weakened health systems and are less safe than they were a year ago. We cannot let the echoes of COVID-19 permanently damage the future of this generation. Our work for children is more important than ever as we re-build stronger health, education, protection, nutrition, and water and sanitation systems for the future.

UNICEF knows that innovative use of data drives better results for children. We also know that we cannot do this on our own. The Data for Children Collaborative has allowed us to draw on expertise, academic rigour, and advanced techniques to help us as we try to solve some of the greatest challenges for children.

For example, if children are not registered at birth they are invisible and will have never have access to the services they need to survive and thrive – such as vaccinations, education, etc. The poverty and population challenges will enable us to estimate how many children are in a community so that we can provide them with what they need to fulfil their potential. The innovative challenge that is being undertaken around the COVID pandemic will allow UNICEF to provide accurate information to children and their families to keep them safe.

We are incredibly grateful for the commitment and support of the Scottish Government, the University of Edinburgh, and all the individual collaborators who are helping UNICEF achieve our goal of driving better results for all children, everywhere.

"UNICEF knows that innovative use of data drives better results for children. We also know that we cannot do this on our own."

Ritchie Somerville

Head of Strategy, DDI Board Member

"Perhaps the greatest highlight of the first year has been the work on ethics, and how to apply these in the complex environment of services and actions being directed at protecting children, both locally and globally."

The Data Driven Innovation Programme has as its aspiration to empower more people and organisations in the use of data to generate actionable insights from the information they collect in their day-to-day operations, or though the combination of data from other sources that can provide new insights to the challenges they face.

The University of Edinburgh's Partnership with UNICEF and Scottish Government, currently hosted by The Data Lab, is one of the many projects the University is supporting, to test how to have positive impact. The first year has shown us that the challenges that organisations face individually in seeking to use data in new ways are not unique, and that collaboration enables us to explore these in a safe and shared manner.

Perhaps the greatest highlight of the first year has been the work on ethics, and how to apply these in the complex environment of services and actions being directed at protecting children, both locally and globally. This exploration of what ethical data use means, and the need for it to be a cultural approach, rather than a procedural one, has assisted all three partners in understanding that the capability of applying data science so that it is "doing data right" is not just about the technical engineering associated with capturing, wrangling, analysing and presenting data, but rather starts much earlier, in the questions that need to be asked around "just because we can, should we?" The approaches now developed are informing how the Collaborative moves forward into year two and presents a fabulous foundation on which to progress.

William Smith

Senior Lecturer, University of Edinburgh, Academic Lead

One year into the Collaborative, what is emerging is a unique model of connection across sectors to make an impact for children. The Impact Collaborations process highlights the applied nature of this endeavour. We support research for a purpose, with the end user not only in mind, but engaged in the co-constructive process throughout to help ensure the outcomes are tailored and targeted to their needs. From an academic perspective, the Collaborative cuts across academic siloes and breaks the bubble of the academy. The benefits gained for university faculty that have engaged with the Collaborative have been manifold. Most noticeably, academics are (1) able to learn from and draw on others with different expertise and lived experiences, (2) given the space and resources to more quickly respond to the complex, and unanticipated, challenges of today's society, and (3) able to contribute in a concrete and practical way to work that has a clear path toward impact. The University of Edinburgh contributes by drawing from its substantial range of expertise while applying a level of scrutiny to ensure a robust approach to research. The Collaborative then solidifies the University's position as a data centre in Europe, working in unison with other initiatives like the University's Data-Driven Innovation and the Edinburgh Futures Institute.

Over the first year it has been clear that the ambitious creation of a co-constructive project bringing together three large organizations has been a messy process full of fits and starts. Yet, in the back and forth of decision making we hold together with a clear purpose, caring for the next generation. Some demanding times lie ahead as we refine our procedures, further articulate our specific contribution, and move toward a self-sustaining model, but the University of Edinburgh is proud of our involvement in the Collaborative, and grateful to be joined by such devoted partners.

"Yet in the back and forth of decision making we hold together with a clear purpose, caring for the next generation."

PROJECTS

This year we have successfully helped to design and develop nine projects. We work with teams from the proposal stage through to project completion, helping to facilitate multi-sector collaboration and engagement. We are now in the process of developing two further projects to start this year.



THEMES

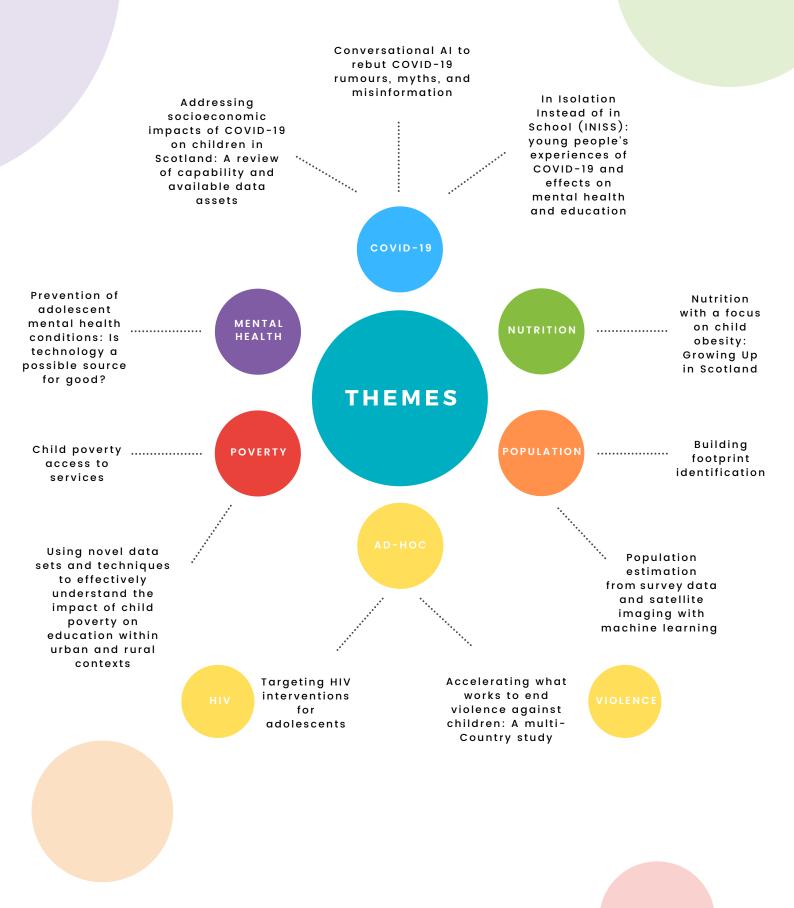
For our first year, our governance boards decided to choose seven key themes for our project portfolio. We felt that this was reflective of the wide range of issues that children are facing today, but allowed us to have a targeted focus to ensure that our work will have a real and lasting impact.

COMMITTED SPEND

The Collaborative is jointly funded by The Scottish Government and the University of Edinburgh's Data Driven Innovation (DDI) programme. This funding covers an initial 3 year period to establish successful output. Our board has committed this spend on our current projects.



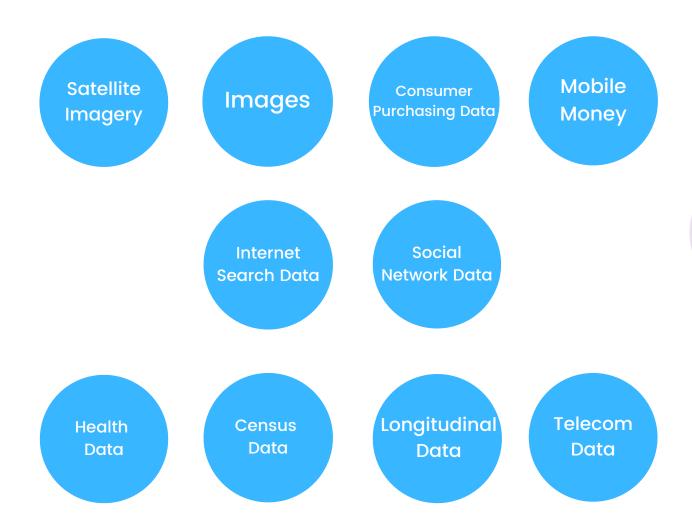
Project Themes



We are data driven.

Part of what makes our mission so unique is our dedication to delivering data driven projects that will improve children's lives. Our projects use numerous different types of data in order to produce results. We encourage our project teams to use new and innovative data science techniques to produce tangible outputs that experts can use.





All of the data we use on our projects is accessed and managed in accordance with legal requirements and our responsible innovation framework.



Making a global impact.

Whilst we are based in Scotland, our commitment to improving outcomes for children knows no borders. We take on projects that have local, national or global aspirations – and also help to refine outputs that can be transferable from country to country. The Collaborative is always looking to expand our network of experts as we continue to encourage individuals and organisations to use data in new and innovative ways with real results.



7 Countries

We currently have live projects across the following countries:

- Scotland
- Côte d'Ivoire
- Uganda
- Mozambique
- Philippines
- Brazil
- Columbia

What does success look like?

Knowledge Exchange

Actionable Insights

Innovative Methodology

Reflecting on our progress this year has allowed us to more formally develop our success measures, or Key Performance Indicators, to help us keep track of our achievements and how we are making an impact.

These three key pillars will guide our actions and allow us to have clear metrics for success as we move into our second year. We want to be a trusted knowledge exchange platform that develops innovative approaches towards funding and project development.

Project Partners

These are the partners currently working directly on one of our live projects.



Responsible Innovation

Data Science Scoping

This steps involves mapping the data landscape and types of data that might be needed, whilst making sure they are proportionate to the project goals

Project Summary

This is a one-page summary that we submit to our boards for funding approval

Project Initiation Document

This document serves as the reference point throughout the project for key information on topics such as financing and data management

Ethical Assessment

This is a bespoke assessment that covers the unique challenge of working on data science projects for children across the project lifecycle

Safeguarding Training

In collaboration with colleagues from UNICEF we have created a comprehensive safeguarding training pack for all teams to complete

Youth Engagement

We are in the process of developing a youth engagement strategy that is both valuable and effective for all involved

Impact Statement

At the end of each project, we will develop an impact statement to detail the tangible outputs and how they have been used. We also use this as an opportunity to document any lessons learned

One of our first and most important tasks has been to develop a responsible innovation framework – a series of steps that each project team needs to complete to ensure that the project is ethical, safe and putting children first.

Our framework is made up of seven key steps, covering areas such as data management, ethics and safeguarding. Whilst this is a unique system for the Collaborative, we have published all of our documents online to encourage others to work safely and effectively on their data science projects.

Responsible Innovation

Here you can find the set of steps we take when setting up a project.





Ethics

For us, every project should be for children - they are always our priority stakeholder. That's why it is important that everyone involved in our projects is committed to promoting and protecting children's rights. Our projects teams make a pledge to always put children, their needs and their rights before the requirements of the project. Successfully delivering an ethical Data for Children Collaborative project requires more than just legal compliance. We want to ensure that every project is being delivered for children in the right way and for the right reasons.

We commissioned a team of students to design and create a bespoke ethical assessment that captures the unique challenges that arise when working on data science projects for children. Our ethical assessment asks both data focused and socio-ethical questions across three key stages of the project lifecycle: (1) Start, (2) On the Road and (3) Destination. We have also developed a Highway Code, which is a supporting document of example answers, tips and additional resources to help our teams to engage with the assessment. Our Compass of guiding principles serves as an overarching tool to ensure we are always acting responsibly.

We are very proud of our assessment and its success so far in opening conversations about potential ethical challenges across our projects, and how we can mitigate against them. We have also published our assessment online for others to use for their own purposes.

We want to give people the confidence to transfer their day-to-day ethical decision making skills to a professional environment.

Click <u>here</u> to view the ethical assessment.



Impact Collaborations

Our Impact Collaborations are a unique way of developing and enabling collaboration. Our mission is to provide the platform that brings together the appropriate data and expertise to answer our challenge questions targeted at improving the lives of children.

We developed this process in order to ensure that we were able to tap into the global network of experts -whether this be data scientists, childhood experts, academics or policy makers.

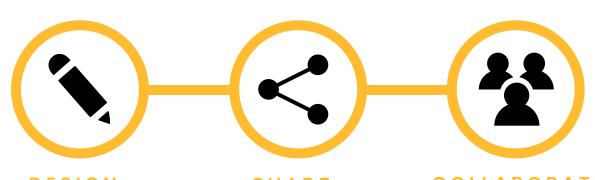
Our team works with our customers to develop a Challenge Question that looks to address an existing problem for children using innovative data science techniques or novel data sets and data linkages.

We post an Expression of Interest form for each challenge that allows applicants to detail their skills and expertise. With an external panel we identify a suitable project team, and work with them and the customer to shape the details of the project and submit this for funding approval.

We currently have one live Impact Collaborations project, "Addressing socioeconomic impacts of COVID-19 on children in Scotland: A review of capability and available data assets", and are in the process of developing two further projects on mental health and child poverty and attainment.

Click <u>here</u> to watch our animated explainer video.

PROCESS



DESIGN

Develop a challenge question with the customer

SHARE

Share the challenge with our networks

COLLABORATE

Bring together a collaborative team to design and develop the project

Child Poverty Access to Services

THE PROBLEM

There is currently insufficient evidence in many low and middle-income countries to understand the reasons why children cannot access basic services. Local governments – increasingly responsible for providing health, education and other services – frequently lack the capacity to determine where and how children are missing out. Without resources to collect local data and consult the communities they serve, decision makers may struggle to develop plans and budgets that reach children in need.



OUR PROJECT

We will explore if access (measured in terms of distance and time) to certain services can be determined using geospatial data sets, such as remotely sensed satellite data and road information from open street maps. Using cutting edge Geographic Information System (GIS) techniques and Earth Observation data, we will estimate travel time to a service. In addition, we will attempt to identify if there is an optimal way of measuring access to services – e.g. straight line distances, door-to-door access or cost surface analysis, which defines the relative difficulty of crossing a certain area. Following this, we will evaluate the contribution of distance and geographic accessibility to health and water services to childhood poverty. We will provide information such as the median distance travelled to a water source and median travel time to clinics for each village. These quantifiable 'scores' will help inform effective and efficient programme design.

THE OUTPUTS

- 'Access scores'
- Land cover maps
- Estimated travel times to services

THE FACTS

£110,000 budget

11 months

Uganda

Nutrition with a focus on child obesity: Growing Up in Scotland

THE PROBLEM

In Scotland, almost a quarter of children are starting school at risk of being overweight or obese, with the poorest children at almost 50% greater risk than the wealthiest. With the influx of cheap and convenient processed foods in our supermarkets, what was once thought of as a problem for the wealthy is now also an issue for more disadvantaged families. Despite the gravity of the obesity epidemic, many countries have yet to develop a successful method by which to regularly monitor the height and weight of a large national sample of children at any age.



OUR PROJECT

The Growing Up in Scotland (GUS) cohort of data is a long-term monitoring project with a specific focus on the early years (0-6.) A wide range of information has been collected about children, since they were 10 months old in 2004/5, as well as their families, including: physical and mental health, home and family life and education. Our goal is to perform analyses of this data to inform the design of obesity/overweight surveillance systems that can be used, not just in Scotland, but internationally.

We will look to answer key questions including: At what specific ages would measuring height and weight most effectively and efficiently identify children at risk of persistent obesity at ages 10 and 12? What underlying risk factors for child obesity could be used to accurately identify cases of concern, and intervene in a preventative way, before obesity develops?

THE OUTPUTS

- Academic report
- Recommendations for the design of an effective obesity/overweight surveillance system

THE FACTS

£78,000

10 months

Scotland

NUTRITION

Building Footprint Identification

THE PROBLEM

Up to date estimates of population in small areas is an essential information for policymakers for many reasons, for example to manage natural disasters for to distribute life saving vaccines. Census data, however, is often collected too infrequently for these purposes. In the absence of frequent census updates, children can be invisible to the key services they need.



OUR PROJECT

The primary work package will involve performing an extensive literature review on population estimates and building footprint identification, as well as analysing the existing databases on estimated population density and building footprints to see if they are sufficient for UNICEF's needs.

We will then assess the performance of existing methods, both from reported performance in the literature and from running available tools on data that is readily accessible, to explore if we have adequate and relevant data for more extensive machine learning approaches. This will enable us to identify any gaps in the data and methods before we move to further project phases.

THE OUTPUTS

- Academic report
- Literature review

THE FACTS

£12,000 budget

1 month

Mozambique

POPULATION

Population Density Estimation

THE PROBLEM

Up to date estimates of population in small areas is an essential information for policymakers for many reasons, for example to manage natural disasters for to distribute life saving vaccines. Census data, however, is often collected too infrequently for these purposes. In the absence of frequent census updates, children can be invisible to the key services they need.



OUR PROJECT

In this project, we will develop machine learning methods to reliably estimate population density from sparse survey data and satellite images in a sustainable manner, i.e., using minimal human supervision and resources.

We will use state-of-the-art machine learning tools for extracting features from satellite images that are relevant for population density estimation. We will also explore statistical models that take into the consideration the spatial correlation of population density and compare them against models that ignore this assumption to assess the applicability and effectiveness of end-to-end learning for estimating population density from satellite images without explicit feature extraction.

THE OUTPUTS

 Scalable machine learning algorithms for population estimation

THE FACTS

£110,785 budget

8 months

Mozambique

POPULATION

Conversational AI to Rebut COVID-19 Rumours, Myths, and Misinformation

THE PROBLEM

As the world battles the COVID-19 pandemic, an epidemic of misinformation has been circulating through different communication channels and communities, preventing people from accessing and identifying accurate information from official sources. The spread of misinformation in times of a global health crisis can mean that children are unprotected and uninformed about the dangers of the disease and how to keep themselves safe.



OUR PROJECT

On 17th February 2020 U-Report launched a COVID-19 Information Chatbot to provide critical information to communities and receive feedback to inform UNICEF's response. The platform has reached over 3.5 million people, including refugees and migrants, and has been deployed in 50 countries with over 6 million bot interactions. Through communication channels like SMS, Viber, Facebook Messenger, and WhatsApp, users are receiving life-saving information.

Working with Alana AI, the objectives of our project are to increase UNICEF's ability to identify and track rumours and myths around COVID-19 through the U-Report Chatbot, and to develop more sophisticated tools for responding to and debunking rumours submitted through the chatbot.

THE OUTPUTS

- Automatic rumour classifier tool
- Chatbot conversational flows

THE FACTS

£62,000

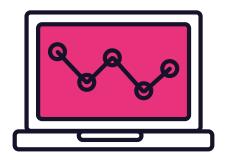
3 months

Global

Addressing socioeconomic impacts of COVID-19 on children in Scotland: A review of capability and available data assets

THE PROBLEM

Coronavirus has had an unprecedented impact on children and their families across the globe. There is a worry that COVID-19 will not only create new problems for children but will also exacerbate a range of pre-existing issues. In order to best understand what these socioeconomic issues are, and how we can work to solve them, in-depth knowledge and awareness of the data landscape will be critical.



OUR PROJECT

The aim of this project is to conduct a desk-based exercise that maps the sources of information (data) - and details about those sources - that are seen to relate to understanding more about the socioeconomic impacts of COVID19 for and on children, and by extension how to tackle them. The project team will first define a) what we mean by socioeconomic impacts and b) what we mean by data. They will then identify categories of highest interest and importance (such as health impacts, educational impacts, impact on household income.) Following this, the team will perform a literature search and literature review of anything relevant to the socioeconomic categories identified. This will include literature published pre-pandemic and since the outbreak, to set the scene regarding the existing socioeconomic issues and how these have been/might be exacerbated by the pandemic.

THE OUTPUTS

- Literature review
- Data catalogue
- Capability map

THE FACTS

£43,000

3 months

Scotland

In Isolation Instead of in School (INISS): young people's experiences of COVID-19 and effects on mental health and education

THE PROBLEM

It is well known that schools provide structure and safety, particularly to vulnerable children and young people. Current school closures impact all young people but are likely to place vulnerable young people at further risk of mental ill-health. Not only have they missed out on quality education, but also the broader positive impacts of their school environment. There is a concern that this could have worrying impacts on children and young people's mental health in both the short and long-term.



OUR PROJECT

This research will provide vital national data directly from pupils, to assess impacts on mental health and education. It will contextualise pupils' experience within data on COVID-19 prevalence, health patterns and trends and against educational achievement outcomes data, to inform interventions and policy making.

Students can complete a survey that will gauge how classroom closures, feelings of isolation and exam cancellations have affected their mental health and wellbeing. The study will also assess the effect of school closures on the mental health of pupils typically identified as vulnerable. Young people will be asked what they think can be done to address any concerns they raise.

THE OUTPUTS

Academic report

THE FACTS

£0 (supporting)

7 months

Scotland

Targeting HIV Interventions for Adolescents

THE PROBLEM

Twenty-five years into the HIV response, critical bottlenecks still limit the design and delivery of appropriate services to adolescents and young people at risk of HIV. 360,000 adolescents are projected to die of AIDS-related diseases between 2018 and 2030 without additional investment in HIV prevention, testing and treatment programs. As HIV affects people differently across cultures, genders, ages and locations, there is no consistent way to deliver treatment. Therefore careful planning of the appropriate approaches to prevention, care and treatments are essential.



OUR PROJECT

This phase of the project aims to identify sub-national geographical areas that contain the largest adolescent population and the greatest clustering of adolescent specific risks and vulnerabilities. More accurate geographic prioritisation and periodic risk monitoring will be achieved through the use of novel analytic techniques, such as machine learning and small area estimates, to combine geo-tagged data sources.

The output of this phase will be a heat map that prioritises geographic areas and segments populations for programming purposes. This will mean that the user can see, at a more granular geographic level, population groups who potentially need urgent help and what type of help would be best suited – assisting the delivery of the right interventions to the right adolescents at the right time and on the right scale.

THE OUTPUTS

- Heat map
- Prioritisation of geographic areas and populations for programming

THE FACTS

£112,000

9 months

Côte d'Ivoire

Accelerating what works to end violence against children: A multi-Country study

THE PROBLEM

Violence against children happens all across the globe, and can have serious and long lasting consequences for its victims. It is important that governments have access to, and sight of, the appropriate data and evidence in order to understand the most effective methods to make changes that will protect children from all types of violence.



OUR PROJECT

The aim of this particular project, with national partner universities in Colombia, Philippines, Côte d Ivoire, Brazil and Uganda, is to map the data landscape on violence against children (VAC) by conducting regional (Africa, Americas and Asia) systemic reviews of INSPIRE interventions to identify SDG accelerators' for most effective and rapid violence reduction.

Key research questions will include: Are there strategies that predict reductions across multiple forms of child violence Can we combine effective provisions to make lean packages of "best buys" for governments?

THE OUTPUTS

- Data map
- Outcomes to feed into national action plans to end violence against children

THE FACTS

£10,000

3 months

Columbia, Philippines, Côte d'Ivoire, Brazil, Uganda

Lessons Learned

IMPACTS OF COVID-19

As a result of the global pandemic, we have been forced to change our ways of working. We are no longer in an office and have moved completely online. Working with partners across the globe has meant that we were already well accustomed to using online meeting software, and our regular discussions were met with little disruption. However, we have had to accept the inevitable delays to project progress as a direct result of the pandemic.

ETHICS CAN BE DIFFICULT

We created a bespoke ethical assessment to allow our project teams to think through the real-world impacts of their projects. However, particularly in the data world, ethics can be seen as a blocker to innovation. To avoid the ethical assessment becoming a mere 'tick-box' exercise, we have realised that each team might need to engage with the assessment in a different way. We now make sure we develop an action plan that suits the team, and are available to support and guide them when needed.

PROJECT MANAGEMENT

Working with so many collaborative teams has allowed us to refine our project management style to suit the nature of our work. We now have a structured way of working through Microsoft Teams, using Planner to document tasks and Sharepoint for important documents. We also work with teams to organise suitable regular meetings that fit their schedules and the style of the project. A consistent 'way of working has allowed us to set expectations from day one.

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COLLABORATION IS KEY

What has made our current projects so successful is the dedication and commitment from our wide network of partners to pitch in and help where they can. Making connections, whether this be to large organisations, in-country expertise or skilled individuals has been critical in helping us access the data and knowledge that we need to move forward. We want to keep expanding our network across different sectors and the globe to really maximise our impact.

Getting noticed.

We have a lot to be proud of this year. Not only do we have a successful portfolio of projects, a robust responsible innovation framework and a vast network of experts, but we have also been recognised for a number of prestigious awards.





