PREDICTING
DISPLACEMENT

Save the Children

**Using Predictive Analytics
to Build a Better Future
for Displaced Children**

Save the Children believes every child deserves a future. Around the world, we give children a healthy start in life, the opportunity to learn, and protection from harm. We do whatever it takes for children—every day and in times of crisis—transforming their lives and the future we share.

Save the Children is the world's leading independent organisation for children. Across 120 countries, Save the Children works to inspire breakthroughs in the way the world treats children and to achieve immediate and lasting change in their lives.

Save the Children International's **Migration and Displacement Initiative** (MDI) was established in October 2016 to drive forward Save the Children's global programming, policy, and research around child migration and displacement.

Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises.

BCG began its global partnership with Save the Children in 2006. As part of this commitment, BCG has supported Save the Children in improving its effectiveness on a wide range of strategic, operational, and organisational issues. BCG has worked alongside Save the Children on its highest priorities, which have included medium- and long-term strategy, country operations, fundraising, and advocacy.

Foreword

The number of refugees, internally displaced people, and asylum seekers has reached historic proportions—by the end of 2017, 68.5 million people were forcibly displaced from their homes due to conflict. More than 35 million were children—a record high.

Forced displacement is one of the defining issues of the 21st century, and the number of affected children and families continues to climb each year. In fact, numbers have doubled since 2006. Yet, despite the fact that children are disproportionately affected by displacement, a disturbing "child blindness" is afflicting our responses: limited understanding, data, programming, or policy development related to the particular risks and challenges faced by these children. To narrow this gap, and to identify solutions and programming interventions, Save the Children established the Migration and Displacement Initiative (MDI) in late 2016.

MDI is pursuing a number of initiatives designed to support forcibly displaced children and families, and this report highlights our most recent project leveraging the power of predictive analytics. Our team, together with colleagues from Boston Consulting Group, developed a prototype predictive analytics tool that provides insight into how a forced displacement will evolve over time.

For years, aid agencies have been hampered in their humanitarian and development efforts because they cannot predict the duration (how long a crisis will last) and scale (how many people will be affected). As a result, they tend to focus disproportionately on short-term needs at the expense of long-term solutions.

With better data on how a displacement will impact children and families over time, aid workers and policymakers can make more informed decisions about whether to focus on short-term humanitarian aid or plan for long-term investments in core infrastructure, such as education, employment, and health care. Too many children and displaced people still fall through the cracks, or the money runs out just at the moment it is most needed.

By harnessing the power of the digital revolution—and working collaboratively in a multi-sectoral way—we have a massive opportunity and responsibility to bridge the gap between humanitarian and development programming.

Our current prototype is just the first step—and we intend to strengthen its accuracy and applicability in the coming months and years. Save the Children is already collaborating with leading organisations within the sector, including the Internal Displacement Monitoring Centre, the Danish Refugee Council, and the Mixed Migration Centre. However, it is vital to engage more broadly so that we can build upon the capacity and technologies that have already been developed elsewhere within the private, public, and social sectors.

No one can do this alone. The scale of the problem is too big and too complex. But, if we work together to get it right, we can transform the lives of some of the world's poorest and most vulnerable children.

Steve Morgan
Director, Migration and Displacement Initiative
Save the Children International

Executive Summary

Approximately 44,000 people are fleeing their homes every day—hungry, exhausted, and often with nothing but the clothes on their backs. More than half of those fleeing are children. Though the crisis has reached epic proportions, the global response continues to be insufficient, in part because aid agencies have limited insight into how long forced displacements will last— or how many people will be affected.

To ensure that displaced children and their families receive the support they need, Save the Children has developed a predictive analytics tool that forecasts the duration and scale of a forced displacement.

This tool is the first step towards fulfilling a larger vision. We call upon our humanitarian and technology partners to join us in working together to enhance this predictive analytics tool and improve the global response to the refugee crisis—so children can have the future they deserve.
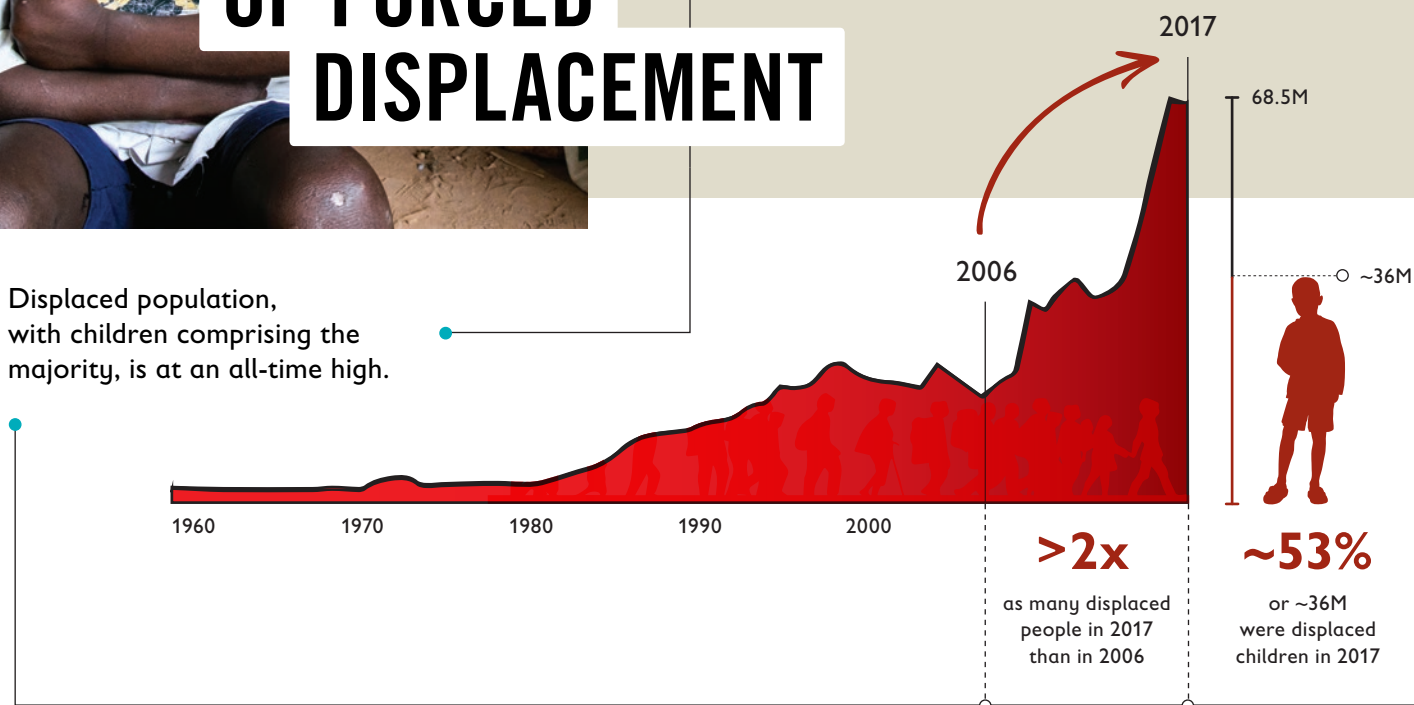
THE PROBLEM OF FORCED DISPLACEMENT

We are facing one of the largest humanitarian and development crises in modern history.

A record-breaking 68.5 million individuals worldwide have been displaced from their homes as a result of persecution, conflict, violence, or human rights violations.[1] That's more than the entire population of France or the United Kingdom.

Displaced population, with children comprising the majority, is at an all-time high.

2017

68.5M

~36M

2006

1960   1970   1980   1990   2000

>2x

as many displaced people in 2017 than in 2006

~53%

or ~36M were displaced children in 2017

This is a children's emergency. More than half of displaced people are under the age of 18,[2] and nearly one in 200 children worldwide is a refugee.[3] Unfortunately, this figure continues to grow, as the median age decreases each year.[4]

Children not only are the most likely to be displaced, but also are disproportionately impacted by the crisis. Displaced children are exposed to grave violations, including killing and maiming, abduction, recruitment into the armed forces, and sexual violence. Many will be separated from their families and live in dire conditions, completely dependent on humanitarian assistance simply to survive. They suffer from higher rates of malnutrition and infant mortality. More than half of all refugee children receive no primary school education—and only 25% of adolescent refugees are enrolled in secondary school. The intensified risks and challenges that displaced children face during their formative years not only harm them as children, but also can negatively impact their development and opportunities as adults.

The problem of forced child displacement is only growing more intense. Extreme poverty as well as environmental factors, including climate change and natural disasters, have contributed to a historic rise in migration and displacement worldwide. Forced displacement from conflict has doubled over the past decade. If it continues to rise at this pace, **an estimated quarter of a billion people will be forcibly displaced worldwide by 2030. The response to this global crisis has been insufficient,** particularly in the case of protracted displacements, which call for more long-term, sustainable solutions, as compared to an acute crisis.

The sad reality is that most people remain displaced long after their initial flight. For example, the average length of displacement for refugees is estimated at 10 years.[5] During an active emergency, when the world's focus is on immediate response, money is often available for providing the basic immediate humanitarian needs of displaced people, such as food, water, and shelter. However, it is much more difficult to prepare for, manage, and sustainably address the numerous and complex factors behind a long-term displacement.

When a crisis stretches from months into years, a sole focus on short-term needs is ultimately counterproductive, and contributes to much greater costs over the long term. A protracted displacement requires support in core infrastructure, such as education, employment, agriculture, and health care. If that support comes too late, the personal development, hopes, and aspirations of an entire childhood can be set back or fundamentally denied.

Syria offers a sobering illustration of protracted displacement. At the beginning of this conflict in 2011, emergency aid was prioritised over long-term support. Nearly all Syrian refugees were given adequate amounts of food cash vouchers, for example, but less than half were given agricultural support. In 2016, seven years into the Syrian crisis, 75% of Syrians were living in poverty, 60% of the Syrian labour force was unemployed, and only 20% of Syrian refugees claimed to be self-sustaining.[6]

If aid agencies struggle to predict how long the displacement will last—or how many people will be affected—it will be extraordinarily difficult for them to respond appropriately. With limited resources and capacity, should they prioritise the delivery of water in trucks or construct a water pipeline? Distribute food vouchers or offer agricultural support? Build camps or move people into longer-term housing and support them to work in the community?

Given that two-thirds of acute crises eventually become protracted, planning for long-term solutions is needed in most cases. Approximately 50% of displaced children become adults in displacement—and we cannot protect these children and their families if we focus disproportionately on short-term needs at the expense of longer-term needs. **Better data and predictive capability is one key to providing more effective support for displaced children and their families, and guiding policymakers and aid workers to know when to prioritise short-term emergency relief or plan for long-term development solutions.**

Case Study: The Children of Rohingya

Since August 2017, Bangladesh has seen an unprecedented arrival of Rohingya refugees fleeing violence in Myanmar's Rakhine State. In 2017 alone, more than 600,000 people crossed the border, making it one of the fastest-growing displacement crises since the Rwandan genocide in 1994.

Save the Children is helping children and families who have made the journey from Myanmar into Bangladesh—and we are collecting their stories. These testimonies paint a disturbing picture of the grave violations that occur against children and the horrors they have been through.

> " They hit me in the face with a gun, kicked me in my chest, and stomped on my arms and legs. Then I was raped by three soldiers. "
>
> Shadibabiran*, a 16-year-old girl

> " We only had leaves from the jungle to eat along the way. I saw three people die on the walk. We were all exhausted. There was no water, and we were starving. "
>
> Roshida*, a 16-year-old girl

> " The military came to our village and took away all the young men. Some of them were only 14 years old. "
>
> Hatim*, a 17-year-old boy who "disappeared"; recounted by his 35-year-old mother Seniora*

*Extracts from Save the Children's report,
Horrors I will never forget: The stories of Rohingya children (2017).

THE SOLUTION:
PREDICTIVE ANALYTICS

When a crisis occurs, aid agencies are equipped to mobilise massive resources in a very short period of time, but the response is often reactive. With the rise in predictive analytics, a new paradigm in humanitarian and development planning becomes possible. Predictive analytics allows agencies to anticipate the onset of a crisis and understand how that crisis will unfold over time. With this knowledge in hand, agencies can visualise the long-term trajectory and impact of a crisis—and prepare accordingly.

Despite the promise of such innovations elsewhere in the aid sector, predictive modelling has rarely been used to anticipate large-scale migration and displacement crises. We have seen some important tools, databases, and frameworks emerge, such as the EU Conflict Early Warning System, which identifies and prioritises situations at risk of violent conflict.[8] Once a crisis is underway, however, agencies have limited tools to help them estimate the impact of the displacement and therefore manage the crisis as effectively as possible.

West African Ebola crisis

In the 2014–2015 West African Ebola crisis, the public health community deployed infectious disease forecasting models to predict the size of the outbreak, its trajectory, and the expected number of cases.[7]

These early projections were instrumental in spurring a powerful public health response that ultimately ended the epidemic.

With the sharp rise in forced displacements, there is an urgent need for tools that can predict factors such as the duration (how long the displacement will last) and scale (how many people will be affected), and provide insight into who will be affected and their specific needs. By improving our ability to predict the duration and scale of mass displacements, we can provide better solutions for children and families caught in the midst of a crisis.

The insights from predictive analytics can help governments, donors, and partners make decisions and plan appropriately from day one. Predictive analytics provides critical information about how a crisis will unfold, right from the start, enabling actors to better target and coordinate their response, make a stronger case for funding, and effectively plan and advocate for long-term solutions, where appropriate. It allows aid agencies to use money more efficiently, which helps us keep children alive, protected, and educated.

Predictive analytics also can provide insights into missing data that could improve the accuracy and breadth of predictions, and can encourage collective action to improve data collection. For example, better disaggregated data could enable the tool to offer granular insights into specific migrant demographics, such as age and gender, allowing actors to better understand the specific needs of displaced people and tailor solutions to meet those needs.

If we know, for example, that a particular displacement crisis has an especially high proportion of women and girls, we could scale up our immediate capacity to provide sexual and reproductive health interventions. Better localised data on the terrain (which can impact the choice of escape routes) and cultural links (which can provide insight on where fleeing populations would feel most safe) could enable aid agencies to predict the routes that displaced people are likely to take and therefore provide better protection support whilst they are transiting.
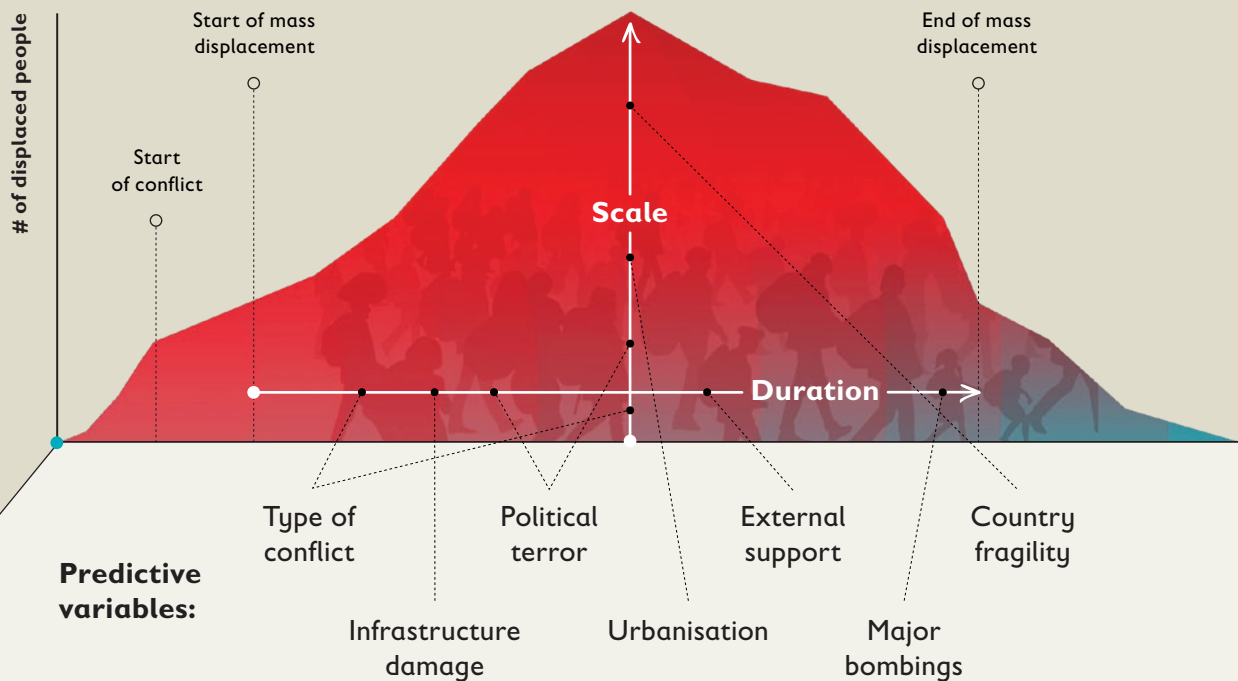
A NEW PREDICTIVE ANALYTICS TOOL FOR MASS DISPLACEMENT

To address this gap in prediction and ensure children and families get the support they need, Save the Children's Migration and Displacement Initiative, working with a team from BCG's advanced analytics team, GAMMA, has created a prototype tool that predicts the duration and scale of a forced displacement. This tool is part of a broader push to better understand, ideate, and utilise innovation and technological advancement in the displacement space. Once a conflict-related crisis affects more than 25,000 people, the tool predicts with 75% accuracy how long the displacement will last (less than five years, five to 20 years, or more than 20 years) and the peak number of people who will be displaced (less than 175,000, between 175,000 and 600,000, or more than 600,000).

Duration and scale are critical indicators in a displacement crisis, because they enable donors to anticipate how much support will be needed—and for how long. If a crisis is predicted to last more than five years, for example, humanitarian and development agencies can prepare to transition from short-term humanitarian aid to longer-term development solutions. Similarly, this evidence allows host governments to make informed decisions about giving displaced people the right to work in their countries.

1 To develop the model, we began by conducting desk research and expert interviews to identify the key drivers that impact scale and duration for a conflict-related displacement. We define "mass displacement" as a crisis that affects more than 25,000 refugees, asylum seekers, or internally displaced persons.

2 Next, we analysed 97 conflict-related mass displacements from 72 countries, between 1960 and 2009, using data from the UNHCR Statistical Yearbooks. We identified 43 indicators with the potential to predict displacement and used two modelling approaches to identify which indicators were most strongly predictive. Seven indicators were found to be most strongly correlated with the duration and scale of a conflict-related displacement: type of conflict, political terror, country fragility, urbanisation, external support, bombings, and infrastructure damage.

3 The prototype tool was tested in multiple countries where Save the Children is currently supporting children and families affected by mass displacements, including Burundi, Ethiopia, South Sudan, and Mali. The pilots show strong potential in supporting efforts towards long-term development planning, preparing host countries affected by long-term displacements, and helping governments appropriately allocate resources.

# of displaced people

Start of mass
displacement

Start of conflict

End of mass
displacement

Scale

Duration

Predictive variables:

Type of conflict

Political terror

External support

Country fragility

Infrastructure damage

Urbanisation

Major bombings

Burundi Pilot Using the Predictive Displacement Tool

Approximately 400,000 Burundi citizens have been displaced since 2015. The conflict in Burundi is complex, with moderate political terror, high country fragility, low urbanisation, limited external support, and no major bombings. Given these factors, the model predicts the Burundi displacement will last five to 20 years and will affect up to 600,000 people.

In Burundi, Save the Children has used this data to develop a multi-year strategy that will support the displaced population over the long term (since the crisis is expected to last more than five years), and we also used this assessment to substantiate our request for €7 million in EU funding.

The tool is still a prototype, and limitations remain. It predicts the duration and scale by comparing the conditions at the onset of a current crisis to the conditions of 97 previous crises for which we have data, and the predictions are set within wide bands of duration and scale. Nevertheless, it has already proven its value as a tool for Save the Children to advocate more effectively, develop more informed strategies, and make a more informed case for much-needed funds.

To better predict the trajectory of a crisis and support displaced children, we also need to collect more granular data. Global migration and displacement data currently offers insufficient visibility across contexts into children's age, gender, and vulnerabilities; whether they are unaccompanied and separated from their families; where they stay; and when they return to their homes (if at all). Incorporating age-disaggregated data into the model will be a high priority in future iterations.

We are heartened by the work being done by others to develop agent-based models, which will provide insight into the decision-making of forcibly displaced individuals and inform even more targeted interventions.

VISION OF A COLLABORATIVE ECOSYSTEM

Predictive analytics has the potential to transform the future of children and families affected by mass displacements. By working together, we can identify significant opportunities to drive effective solutions and inform targeted policies. But we need your help.

Our vision is to build a robust, multi-sector predictive displacement ecosystem that can develop, incubate, and scale innovations for improving global responses to forced displacement. The platform would bring together partners with predictive displacement expertise to drive impact in two ways: collaborative innovation to improve predictive displacement capability, and collaborative action to drive decision-making and application of the tool. In the immediate future, our aim is to improve the prototype by increasing the accuracy and granularity of its predictions, as well as to expand and drive change by applying the tool's main insights to policy, programming, and funding.
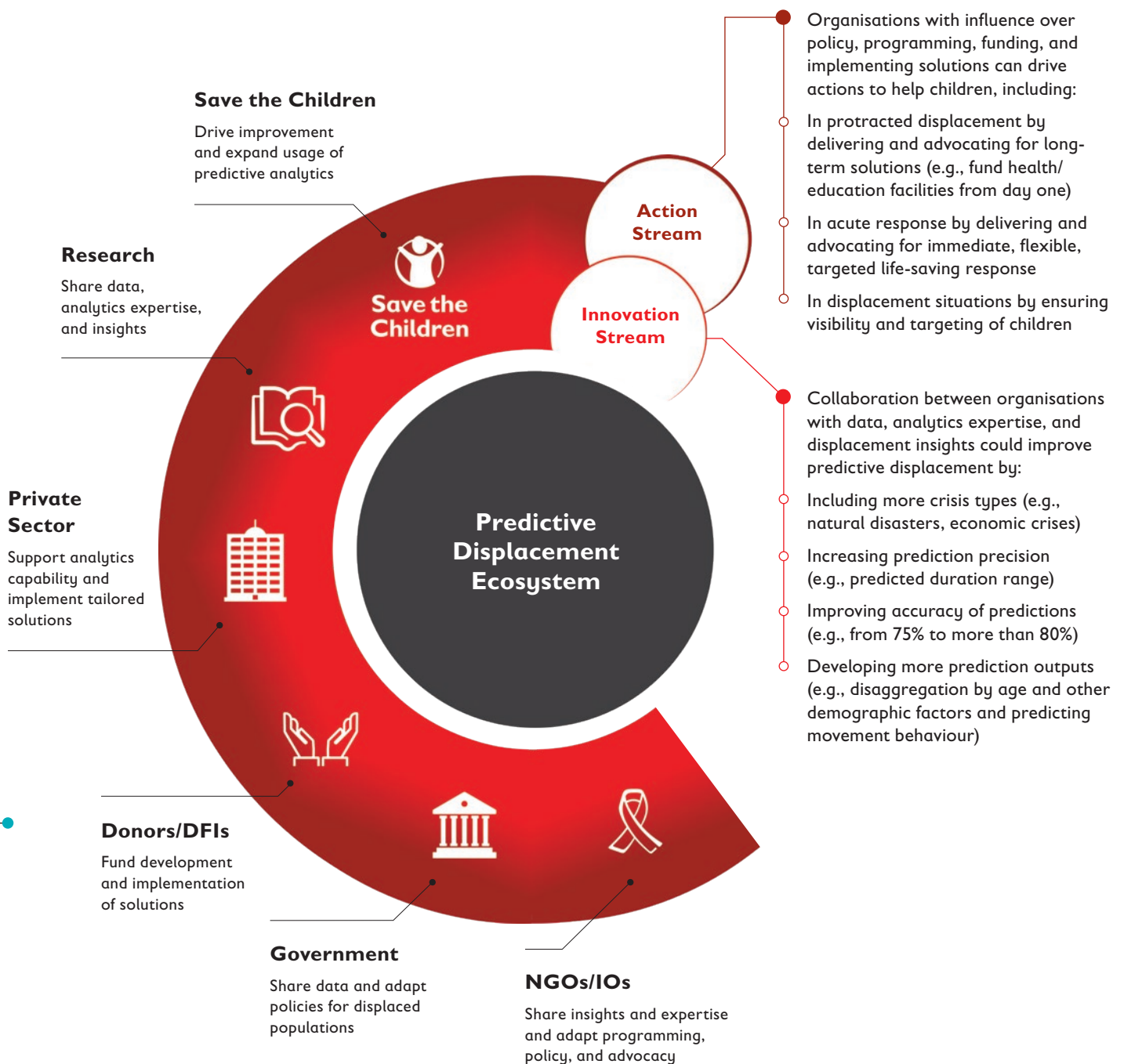
Achieving this vision requires us to forge partnerships with actors in all sectors—donors, development finance institutions (DFIs), the private sector, government, research institutions, and non-governmental organisations (NGOs). Save the Children is eager to build a cross-sector platform that allows data to be collected, shared, analysed, and incorporated into cutting-edge models that can better predict displacement patterns.

Please join us on this journey. By building an action-oriented, collaborative ecosystem, we can reach more children, provide targeted and scalable solutions, remove "child blindness" in migration and displacement policies, and build global awareness for the plight of forcibly displaced children.

To explore opportunities to partner together on this work, please contact Steve Morgan, Director, Migration and Displacement Initiative (steve.morgan@savethechildren.org) or Josiah Kaplan, Senior Research Advisor, Migration and Displacement Initiative (josiah.kaplan@savethechildren.org).

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Predictive Displacement Ecosystem

Save the Children
Drive improvement and expand usage of predictive analytics

Research
Share data, analytics expertise, and insights

Private Sector
Support analytics capability and implement tailored solutions

Donors/DFIs
Fund development and implementation of solutions

Government
Share data and adapt policies for displaced populations

NGOs/IOs
Share insights and expertise and adapt programming, policy, and advocacy

Action Stream

Organisations with influence over policy, programming, funding, and implementing solutions can drive actions to help children, including:

- In protracted displacement by delivering and advocating for long-term solutions (e.g., fund health/education facilities from day one)
- In acute response by delivering and advocating for immediate, flexible, targeted life-saving response
- In displacement situations by ensuring visibility and targeting of children

Innovation Stream

Collaboration between organisations with data, analytics expertise, and displacement insights could improve predictive displacement by:

- Including more crisis types (e.g., natural disasters, economic crises)
- Increasing prediction precision (e.g., predicted duration range)
- Improving accuracy of predictions (e.g., from 75% to more than 80%)
- Developing more prediction outputs (e.g., disaggregation by age and other demographic factors and predicting movement behaviour)

How you can help

We are looking for partners and collaborators across the private, public, and social sectors to support the ecosystem in three ways:

1.

As an innovator in the innovation stream:

Collectively improve predictive displacement capability by sharing data, contributing analytics expertise or technology, dedicating staff, and/or sharing sectoral expertise and insights

2.

As an end user or advocate in the action stream:

Develop use cases for predictive analytics and support the use of analytics to improve the way we support displaced children and their families

3.

As a funder for the ecosystem:

Provide seed funding to set up the ecosystem, build a team to drive collaboration, and fund the ongoing design, build, and use of predictive tools

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