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CEDIL Methods Brief 6

Evidence and gap maps: Using maps to support evidence-based development

Centre of Excellence for Development Impact and Learning

Overview

Mapping is an evidence synthesis approach to describe what research evidence is available and relevant to a particular research or policy question. This brief describes what evidence and gap maps are, what sort of evidence is being mapped, the various ways in which these maps are being used and how you can commission one.

Evidence mapping began in the early 2000s and has taken off in the last ten years, notably with the innovation of an online interactive visual Evidence and Gap Map by the International Initiative for Impact Evaluation (3ie) and the different types of maps produced by the Campbell Collaboration.

Evidence maps provide an overview of the available evidence, increasing its discoverability and accessibility. Maps can play a key strategic role in building the evidence architecture. They inform programme and research commissioning decisions; they help identify the necessary investments to strengthen the evidence architecture; and as are a basis for developing evidence-based products to inform decision-making.

What are evidence and gap maps?

An evidence and gap map (EGM) is a pictorial representation of the available evidence on a topic. These pictorial representations of the evidence identified by evidence mapping help facilitate navigation of, and access to, evidence.

Specifically, an EGM is a matrix or table in which the row headings are intervention names (sometimes organised into categories and subcategories) and the column headings outcomes (again sometimes organised into categories and subcategories). Figure 1 shows the example of the disability EGM (available online).

Each cell in the matrix contains bubbles to represent studies. Typically, there are separate bubbles for primary studies and reviews, which may be further divided according to an assessment of those studies. Crucially, the maps are interactive. The user can click on a cell to get a list of studies in that cell and access the source for each study – the pdf or journal or working paper page.

Evidence maps follow the same systematic principles as a systematic review. These principles require a clearly stated research question, followed by systematic search, screening, coding, analysis and reporting. The findings in the case of a map are the number of studies and their distribution according to various characteristics, such as study design, geography and sub-populations.

Mapping is an approach that may be applied to any research question, e.g. effectiveness, prevalence, risk and protective factors and the consequences of exposure to an adverse event.

What are the different sorts of maps?

Evidence mapping is an evidence synthesis approach that may be applied to any area of research. We describe here the different sorts of maps that have been produced.

Effectiveness maps

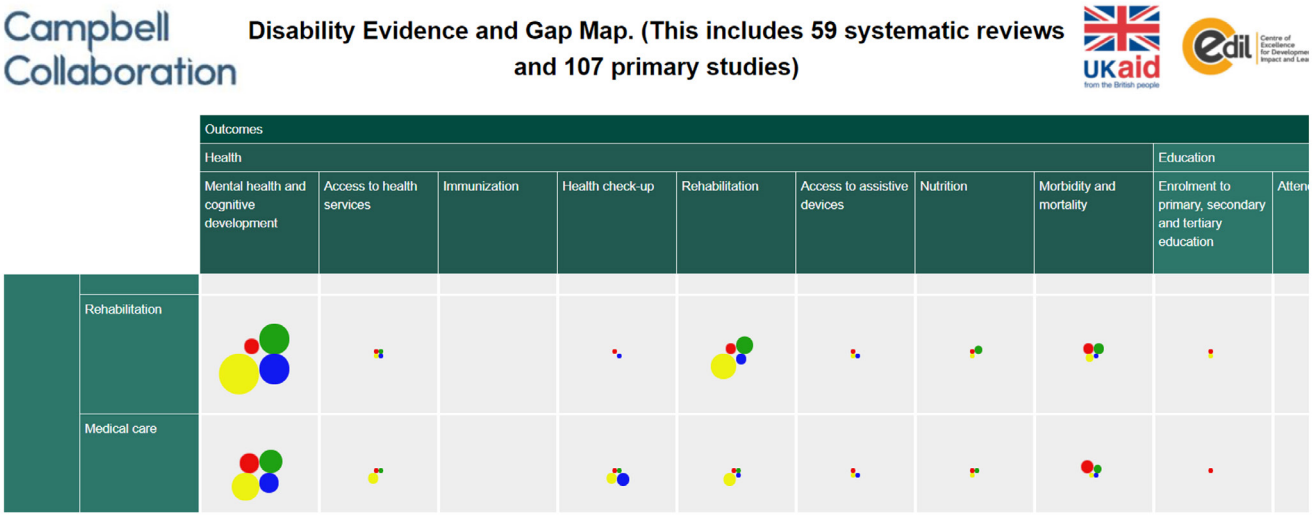
Most EGMs are effectiveness maps, meaning they map studies that assesses the effectiveness of different interventions. Effectiveness maps generally show primary studies and systematic reviews in a framework according to which interventions form the row headings and outcomes form the column headings.

Figure 1 shows a snapshot of the disability EGM (Saran et al., 2020). The section shown illustrates the health section, the most heavily populated part of the map. The bubbles represent impact evaluations and systematic reviews, divided into low, medium or high confidence in study findings.

Users may also be interested in other ways of mapping evidence, that is by using different row and column headings. Using the EPPI Mapper software, the row and column headings can consist of any characteristic of the studies that has been coded. An interesting version of a map is often one where global regions are the column headings.

Figure 2 shows the transport map organised by intervention as the row headings and region, not outcome, as the column headings. The map shows that the evidence is concentrated on road transport, mostly on road infrastructure –

Figure 1: Screenshot of a segment of the disability EGM by intervention and outcome



Source: CEDIL Disability EGM

the lower rows in the segment in Figure 2 for air and water transport (not shown) are very sparsely populated. It can also be seen that most of the literature refers to East Asia – this is especially true for railways, for which there is a fast-growing literature on the impact of the equally fast-growing Chinese railway network.

Map of different evidence synthesis products

Effectiveness EGMs show impact evaluations and systematic reviews. A map with a very broad scope may only include systematic reviews, and possibly other EGMs. The child wellbeing megamap produced with support from UNICEF contains nearly 500 systematic

Figure 2: Screenshot of a segment of the transport EGM by intervention and region

Source: CEDIL Transport EGM

reviews and 25 EGMs across intervention areas of importance to children: early child development, health and nutrition, education, social work and welfare, social protection, environmental health (including WASH) and governance (e.g. child protection).

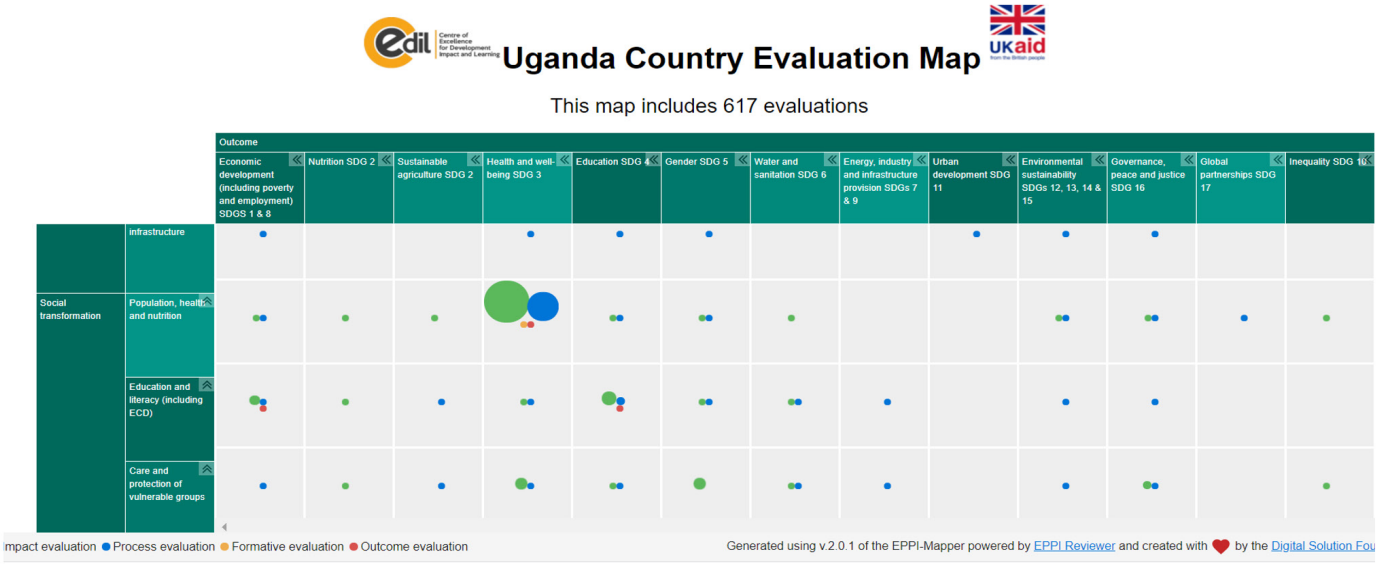
With an even broader scope, CEDIL and 3ie published the map of maps showing 73 maps across the whole of interventional development. The interventions are World Bank sector categories, and the outcomes are the Sustainable Development Goals. The map showed an absence of EGMs for disability, transport and governance, so maps in these areas were commissioned by CEDIL.

Country evaluation maps

Country evaluation maps show all evaluations of development interventions in a country: formative evaluations, process evaluations and impact evaluations. The frameworks for such maps use an intervention category from the current national strategy, with the SDGs as outcomes.

The Uganda map (Figure 3) shows over 600 evaluations published since 2000. A major benefit of such maps is simply to increase the discoverability of evaluation evidence, widening the audience for evaluations that may otherwise have a small readership.

Figure 3: Screenshot of a segment of the Uganda country evaluation map



Source: CEDIL Uganda Country Evaluation Map

Maps of other research questions

Maps may focus on any research area. Two examples come from the FCDO-supported project Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA).

The first map is a map of innovative tools, methods and metrics to understand food systems and agriculture–nutrition linkages since 2008. This map has been used to inform IMMANA's grant programme and to fund new studies, which have filled gaps or usefully built on existing approaches.

The second map includes over 3,000 studies concerning the impact of plastics in the food system. The rows of the map reflect the food system subsector: agricultural production, processing, storage and distribution, retail, consumption and waste disposal. The columns consist of impact domains on human health, food security and environment.

How are EGMs being used?

Using maps to commission further research to inform policy

The CEDIL map of maps was used to identify areas that lacked maps and were of interest to the FCDO, resulting in the commissioning of three further maps: access to justice, disability and transport.

The studies identified in the disability map were used to undertake three rapid evidence assessments feeding into discussions at the Global Disability Summit in July 2018, as well as to inform the design of two UKAID-funded disability programmes: the Disability Inclusive Development Programme and the Programme for Evidence to Inform Disability Action. These rapid evidence assessments are now being turned into full systematic reviews.

As another example, the UNICEF–Innocenti Research Centre (IRC) provided support to the Campbell Child Wellbeing megamap of systematic reviews across a broad range of child wellbeing outcomes such as health, education and child protection. This map showed a lack of reviews in the area of interventions to tackle violence against children. Therefore, to take a closer look at the evidence base in that area to assess if there are primary studies, UNICEF–IRC commissioned the violence against children map.

Using maps as a basis for rapid evidence assessments and reviews

Having a map reduces the time needed to produce one or more rapid evidence assessments or full systematic reviews, since these evidence synthesis papers can be based on the studies in the map and may possibly also use some of the map's coding. The case of the CEDIL-supported disability map mentioned above is an example of this. Other examples include the two maps on interventions for people experiencing homelessness published by the Centre for Homelessness Impact, which were used to identify studies to include in three systematic reviews. The map was also subsequently used by the National Institute for Health and Care Excellence to inform new guidance.

Using maps to develop products to inform decision-making

Evidence-based products to inform decision-making – such as guidelines, evidence portals and 'best buy' guides – are a key route to getting research evidence into use. These products should be based on systematic reviews. Evidence and gaps maps thus help identify existing reviews that can be used for this purpose, or where there are clusters of unreviewed studies so that new reviews can be commissioned.

With CEDIL support, the International Centre of Evidence for Disability has developed an evidence portal. The disability evidence map supports this portal in two ways: directly, it identified the first set of reviews to be used as content for the portal; and indirectly, it identified primary studies that are being summarised in new reviews, which will also go into the portal.

This approach is also being used by several What Works Centres in the UK. For example, the Youth Endowment Fund evidence map includes over 200 reviews, from which the most relevant were picked as the basis for the technical reports that inform their evidence portal or toolkit. The map has also been used to identify topics for which reviews need to be commissioned or updated to add further approaches to future releases of the toolkit.

Using maps to produce evidence summaries

Evidence maps show what evidence is available and not what the evidence says. However, sometimes the producers of the map go a step further and provide summaries of selected studies in the map.

One of the most comprehensive versions of this approach is the map on interventions to address child maltreatment in institutional settings. For this map, the study team prepared cell-wise evidence summaries for every cell. These summaries can be accessed by clicking on any cell in the map.

In other cases, the summaries may only include evidence from one or more systematic reviews. This approach has been used for an evidence map on sexual and reproductive health and rights (forthcoming) commissioned by the Dutch government, and one for the Youth Endowment Fund in the UK.

Using maps to increase the discoverability and use of evidence

The Uganda country evaluation map was first presented at the 2019 Uganda Evaluation Week. The map shows a concentration of evaluations under health and wellbeing. As a follow-up, the Office of the Prime Minister (OPM) embarked on developing an Evaluation Agenda for the health sector. The OPM also led Uganda's Voluntary National Review (VNR) of the implementation of the SDGs, with the report being presented by the Minister for General Duties at the UN High Level Political Forum in October 2020. The VNR was predominantly a desk review of existing evidence on SDG implementation. The OPM used the EGM to identify recent relevant studies across the different SDGs. The OPM has also embarked on developing the Evaluation Agenda for the National Development Plan III (2020/21–2024/25), which will be structured around the 18 programmes of the plan. This presents another opportunity to utilise the map.

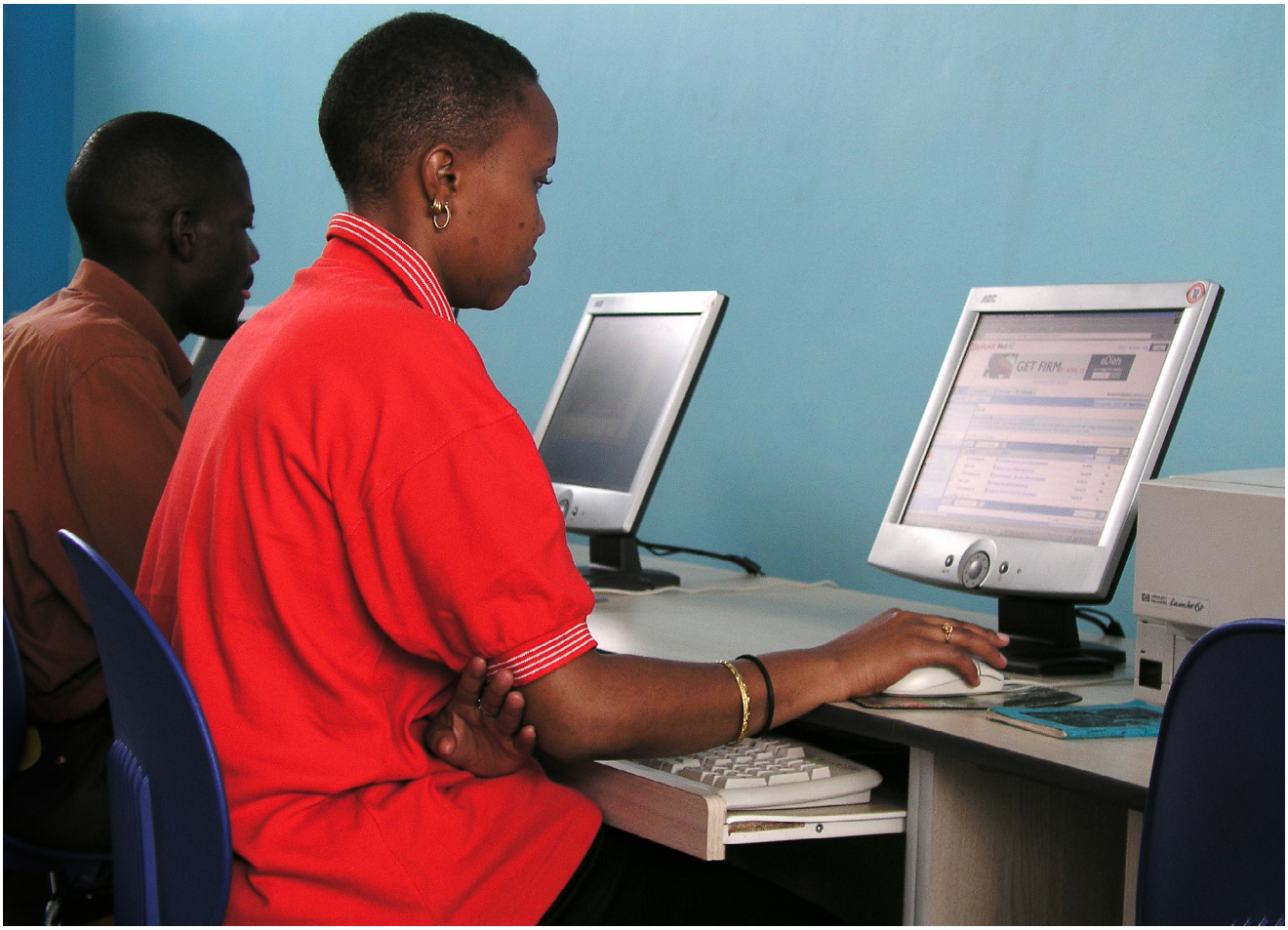
How to make an EGM

The initial and most important stage of creating an EGM is to define the framework (the row and column headings to be used), as well as any other study characteristics to be coded, such as study country and sub-populations (e.g. older people, humanitarian setting or children and young people), which can be used to filter the studies. A research team should develop the framework in consultation with the funder, who may in turn also engage with other key stakeholders in the process. Framework development is usually an iterative process of piloting and revision. Co-production with the funder of the framework through this piloting process ensures a clear understanding of scope and therefore of relevance.

Once the framework is defined, the study team can use this to develop the search strategy and coding forms to produce the map. This process is described in more detail in the Campbell EGM Guidance.

Maintaining maps

Since EGMs generally have a broad scope, the literature they cover will be expected to grow quite rapidly. It is thus a good idea to have a maintenance plan to update the maps every 12–18 months. It is also possible to have a map as a living map that is updated continuously. The use of machine learning algorithms for searching, screening, and data extraction help semi-automate the mapping process. An example of a living map is the EPPI Centre's COVID-19 map.



Where can I find EGMs?

The agencies most closely involved with EGMs in international development, and evidence mapping more generally, are all members of the CEDIL consortium.

- 3ie was the first to develop the interactive maps. A page dedicated to EGMs, with related resources and a link to the latest EGMs, can be found on their website.
- The Campbell Collaboration is an international research network publishing evidence maps and systematic reviews on issues of relevance for both developed and developing countries. A list of published EGMs can be found website.
- The EPPI Centre developed the EPPI Mapper software and has a number of maps, such as the living map of COVID-19 and social science research.

In addition, the Collaboration for Environmental Evidence (CEE) has many environment-related maps, though CEE maps are reports of the literature without interactive, online mapping. A list of completed and ongoing CEE maps may be found online.

How do I go about commissioning a map?

Several research teams produce EGMs. The CEDIL Secretariat are happy to put you in touch with an appropriate team or may be able to help you themselves. The research team will work with you to determine the scope of the map and the framework. They will then search, screen and code the literature following systematic evidence synthesis principles.

Depending on the scope of the map, how well defined it is when you commission it and what complementary derivative products you want, a map may take 3–6 months to produce and cost £40,000–120,000.

However, it is good to have a maintenance plan. It would be preferable to commission a map with annual updates for 3–5 years, after which you may wish to review its scope, framework and utility. An annual update will cost approximately 60%–80% of the of the first commissioned map.

About this brief

This brief has been prepared by Howard White. It is primarily based on CEDIL Methods Working Paper 5: White, H. (2021) *The strategic use of evidence and gap maps to build the evidence architecture*. Available at: https://doi.org/10.51744/CMWP5

Further reading

Snilstveit, B., Vojtkova, M., Bhavsar, A. and Gaarder, M. (2013) *Evidence gap maps: a tool for promoting evidence-informed policy and prioritizing future research*. Policy Research Working Paper No. 6725. Washington DC: World Bank. https://openknowledge.worldbank.org/handle/10986/16941

Saran, A. and White, H. (2018) 'Evidence and gap maps: a comparison of different approaches', *Campbell Systematic Reviews*, 14, pp. 1–38. https://doi.org/10.4073/cmdp.2018.2

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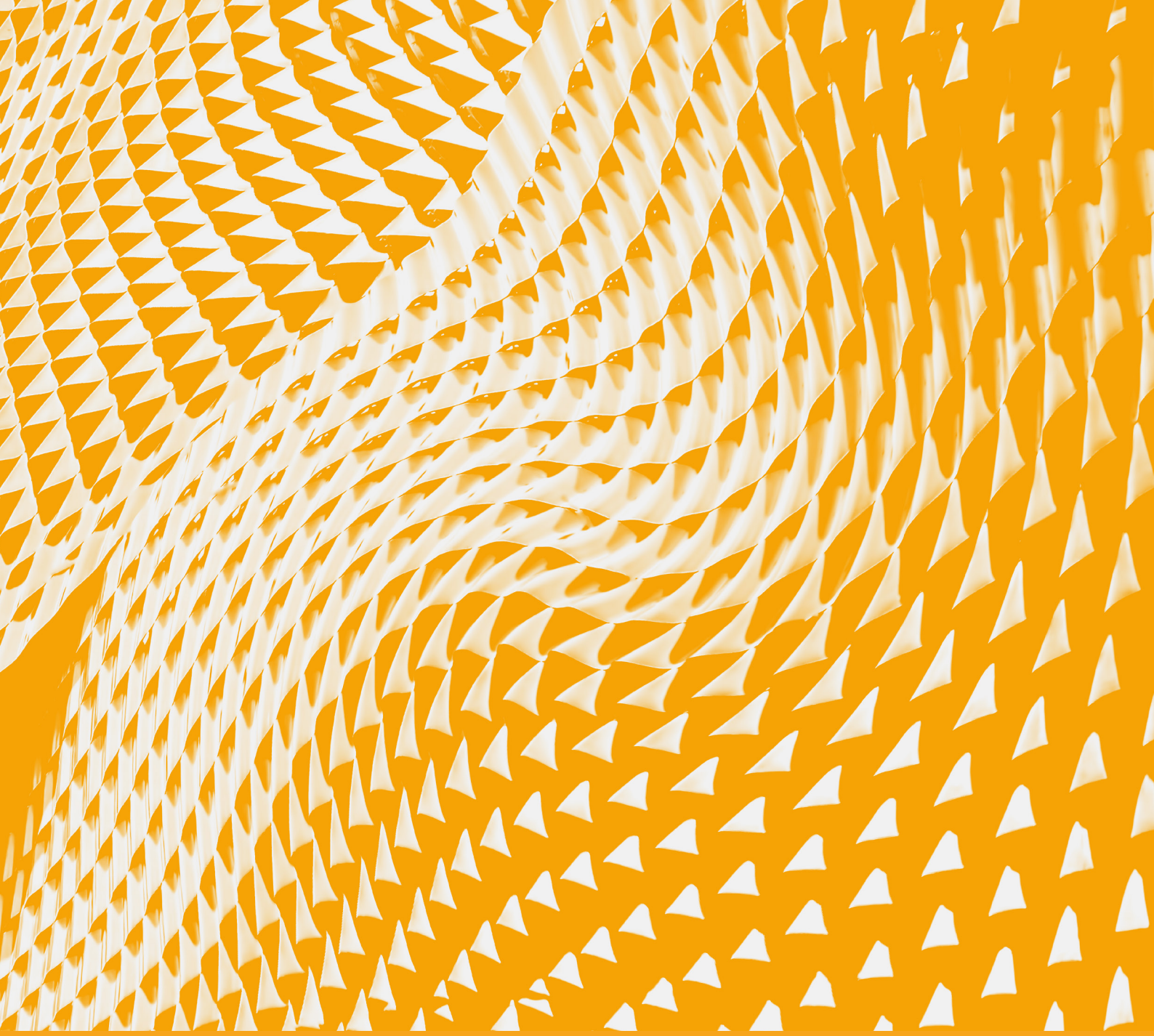
Photo credits

p.5: UNICEF Ethiopia, p.6: U.S. Mission Uganda, p.7: Zainul Yasni, p 8: World Bank



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About CEDIL

The Centre of Excellence for Development Impact and Learning (CEDIL) is an academic consortium supported by the UK Government through UKaid. The mission of the centre is to test innovative methodologies in evaluation and evidence synthesis and to promote evidence-informed development. CEDIL-supported projects fall into three programmes of work: evaluating complex interventions, enhancing evidence transferability, and increasing evidence use.

For more information on CEDIL, contact us at **cedil@opml.co.uk**
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