A young girl in pre-primary school, Sierra Leone.
GPE/Ludovica Pellicioli

Mapping early childhood development research outputs in sub-Saharan Africa

Cross-country mapping report

REAL
Research for Equitable Access and Learning

ESSA
Education Sub Saharan Africa

Authors

The writing of this report was led by Eunice Mueni Williams, REAL Centre. The work was overseen by Pauline Rose, who provided oversight, guidance and editing.

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List of abbreviations

AERD	African Education Research Database
AJOL	Africa Journal Online
CESA	Continental Education Strategy for Africa
ECD	Early Childhood Development
ECDAN	Early Childhood Development Action Network
ECCE	Early Childhood Care and Education
ECE	Early Childhood Education
ECED	Early Childhood Education and Development
ESSA	Education Sub Saharan Africa
NGOs	Non-Governmental Organisations
R&D	Research and Development
SDGs	Sustainable Development Goals
SSA	sub-Saharan Africa
UNICEF	United Nations International Children's Emergency Fund
UNESCO	United Nations Education Science and Cultural Organization
WHO	World Health Organization

Summary

This report summarises the findings from analysing Early Childhood Development (ECD) research outputs spanning 2010-2022 which were mapped in four countries: Ghana, Kenya, Tanzania and Uganda. The mapping exercise focused on unpublished and locally published research outputs, including journal articles, working paper series, PhD theses, books (chapters), and evaluation and intervention reports.

The findings showed that the research outputs on ECD have increased since 2010, although the total numbers varied widely across countries. They also varied across the six ECD components, namely health, nutrition, environment and protection, education, responsive caregiving, and play. Kenya had the highest number of research outputs at 576, while Tanzania recorded the lowest at 189 research outputs.

The health component attracted the most research, funding and collaboration across all the four countries, while play and responsive caregiving had the least research. Play, education and responsive caregiving attracted the least funding in all countries.

There was variability in the extent to which ECD research is funded across the countries. For example, 63 percent of the ECD research conducted in Uganda was funded, compared with only 24 percent and 36 percent in Ghana and Kenya respectively. Most of the funding in Uganda came from international and philanthropic organisations, with a minimal role played by the national governments, local organisations and internal institutions, including universities. Collaboration with researchers outside SSA also followed a similar pattern, with Uganda having the highest number of international collaborations (33 percent), while Kenya had the least number of collaborations (23 percent). There was minimal collaboration among researchers across SSA countries, which could be an indication of limited knowledge exchange and learning in the region. There were a larger number of such collaborations in Uganda (16 percent). Women were underrepresented in the outputs, ranging from 36 percent in Ghana to 45 percent in Tanzania. Kenya was an

exception, where a larger proportion (52 percent) of the authors identified were women.

We found that there were fewer national research outputs identified through country-level searches compared to publications from international databases for the period 2020-2022, and that women were less likely to publish in international journals than in national research outputs. In addition, international organisations and philanthropies fund more ECD research indexed in international databases than those in national outlets. Also, publications in international databases were more likely to be co-authored with researchers outside SSA.

We propose the following recommendations based on our analysis:

- Increase research outputs in those ECD components for which there is least research, namely play and responsive caregiving.
- Provide greater access to funding particularly for education and play research.
- Advocate for processes that enable more women to publish in international journals.
- Encourage collaboration between African researchers within the continent.

1. Introduction

The first 1,000 days of life are critical to a child's development and contribute greatly to their potential later in life (Black et al., 2017; Yoshikawa & Kabay, 2015). The accrued benefits extend beyond children's early years to their adulthood and have an impact on national economic and individual life prospects, including school readiness (Naumann, 2018; UNESCO, 2022). This calls for investment in Early Childhood Development (ECD) (UNICEF, 2019). According to UN estimates, around 16 percent of sub-Saharan Africa's population was below five years in 2022 (UN Population Division, 2022). This makes focusing on children in their early years imperative.

ECD involves the creation of favourable conditions to facilitate the cognitive, social, emotional, linguistic, and physical development of young children (World Health Organization et al., 2018). This in turn helps children to survive, thrive and achieve their full potential. Several global, regional and national policies and development frameworks capture commitments to improve ECD. The Sustainable Development Goals (SDGs) committed to ensuring equitable access to quality ECD and early learning opportunities by 2030 (United Nations, 2015), while the Continental Education Strategy for Africa (CESA 2016-2025) identifies early childhood education as the pillar on which future learning and training are grounded. This is recognised as the next frontier if Africa is to realise sustained quality education and training (African Union, 2015).

There is a need to understand the status, challenges and opportunities for improving ECD in African countries, and to systematically analyse evidence on ECD and its various components. The CESA (2016-2025) specifically calls for revitalisation and expansion of research and innovation to address continental challenges and promote global competitiveness, focusing on building and enhancing capacity for data collection, management, analysis, and communication. The Africa Union's Early Childhood Education and Development (ECED) Cluster identified enhanced research generation, documentation and dissemination as one of the objectives in achieving its mandate. This makes it paramount to explore the ECD research landscape in African countries to identify available evidence that guides the

development and implementation of policies, as well as resource allocation and practice.

Because of the myriad challenges faced by researchers in sub-Saharan Africa to publish in high-ranking journals often indexed in international databases, local evidence could remain unpublished or published in local or regional journals (Asare et al. 2021; Tarkang & Bain, 2019). Research not indexed in international databases is often perceived as of lower quality and is frequently overlooked in decision making (Collyer, 2018). Focusing only on published and indexed research however gives an incomplete picture. Evidence shows that despite a relatively low number of journal article publications in sub-Saharan Africa, there is significant research activity (DFID, 2019; Marincola & Kariuki, 2020). This local research is contextualised and often derived from practice, and is thus better placed to inform local investments, policy and practice. However, its influence on domestic issues appears limited (DFID, 2019).

To identify local research, we mapped research outputs related to evidence on ECD by Africa-based authors for the period 2010 to 2022. These incorporated local and regional journals and databases in sub-Saharan Africa (SSA) countries (excluding South Africa[i]). This entailed searching various institutional websites in each country, regional databases e.g. African Journals online, reviewing academic and publication profiles of researchers identified via online surveys and in-country engagement, and contacting experts within ECD for recommendations for research output resources we may have missed out (Williams et al., 2024).

Because this is a labour-intensive undertaking, country-level research output mapping was limited to four countries:[ii] Kenya, Tanzania, Uganda and Ghana. This report summarises the findings from the mapping exercise in these four countries. We compared the findings with publications identified by searching international databases (Iddrisu, Adrupio & Rose, 2024).

We refer to both published and unpublished research as research outputs, in recognition that searches went beyond published academic articles and books. We therefore included unpublished research such as working papers.

2. ECD context

ECD has received considerable attention and debate in recent international policy and research agendas. Many African countries have developed ECD policies or strategic plans to guide ECD programming. According to a recent report by UNICEF, slightly over half of the 21 East and Southern Africa countries had developed a national ECD policy or strategic framework by August 2020 (UNICEF, 2021). This includes all our focus countries in this region.

Despite a policy environment favouring ECD, access to ECD remains low. In the East and Southern Africa region, reports based on most recent data show that on average nearly three quarters of young children are not accessing early childhood education (UNESCO, 2022). Financial constraints are the most glaring challenges to accessing pre-school. In most countries in the region, ECD services are provided by the private sector at a cost that is prohibitive for poor families, especially those living in rural areas. This has resulted in inequality of access to ECD services, with the wealthier households recording higher access (UNESCO & UNICEF, 2024).

With respect to the four focus countries, where data are available, more than one third of children were off-track to achieve their developmental milestones in 2023. Only 47 percent of children were on track in Tanzania, increasing to 68 percent in Ghana (Table 1). The risk of poor development (a composite indicator of under-five stunting or poverty) ranges from 23 percent in Ghana to 66 percent in Tanzania (Nurturing Care for Early Childhood Development, 2023). The picture on enrolment in pre-primary education does not look better, with a low of 14.4 percent net enrolment in Uganda, while Kenya exhibits the highest enrolment at 78 percent (World Bank, 2024).

Table 1: ECD indicators in selected countries (latest data available)

Country	Child development on track (2023) (%)[1]	Young children at risk of poor development (2023) (%)[1]	Early childhood education enrolment (latest year) (%)[2]
Ghana	68	23	71
Kenya	NA	45	78
Tanzania	47	66	77
Uganda	65	46	14.4

Note: NA=Not available

Source: UNICEF *et al*, 2023[1]; World Bank, 2024[2]

These poor outcomes could be explained by low investments in ECD programming. Most of the policies are not accompanied by elaborated financing strategies, and multisectoral coordination in the delivery of ECD services is problematic in most countries. Evidence shows that young children (0-6 years) in SSA are benefitting from significantly less spending than older children, with a total funding gap for ECD-focused health and education services standing at more than 90 percent (UNICEF, 2021). Health expenditures account for the bulk of ECD spending in the region.

One of the major funding challenges is the low priority afforded to ECD services within essential sectors. Aid to ECD was estimated to be just 3.1 percent of total aid in 2019, significantly less than the share of the global population aged between birth and five years of age which, in 2020, was estimated to be 11 percent. The vast majority of ECD aid is spent on health, with education representing a small fraction of this spending (Zubairi & Rose, 2021). At the UNESCO Conference on Early Childhood Care and Education (ECCE) held in Tashkent, Uzbekistan in 2021, countries committed to dedicate at least 10 percent of total education expenditure to pre-primary education to ensure that the necessary infrastructure, materials and professionally trained workforce are available for a quality ECCE programme (UNESCO, 2022).

There is still a large margin between this commitment and actual allocation. Only 2 percent of domestic education budgets are allocated to pre-primary education in low-income countries, compared to a global average of 6.6 percent in 2022 (UNESCO 2022; UNICEF, 2021). Regarding aid to education, only 1.4 percent of education aid

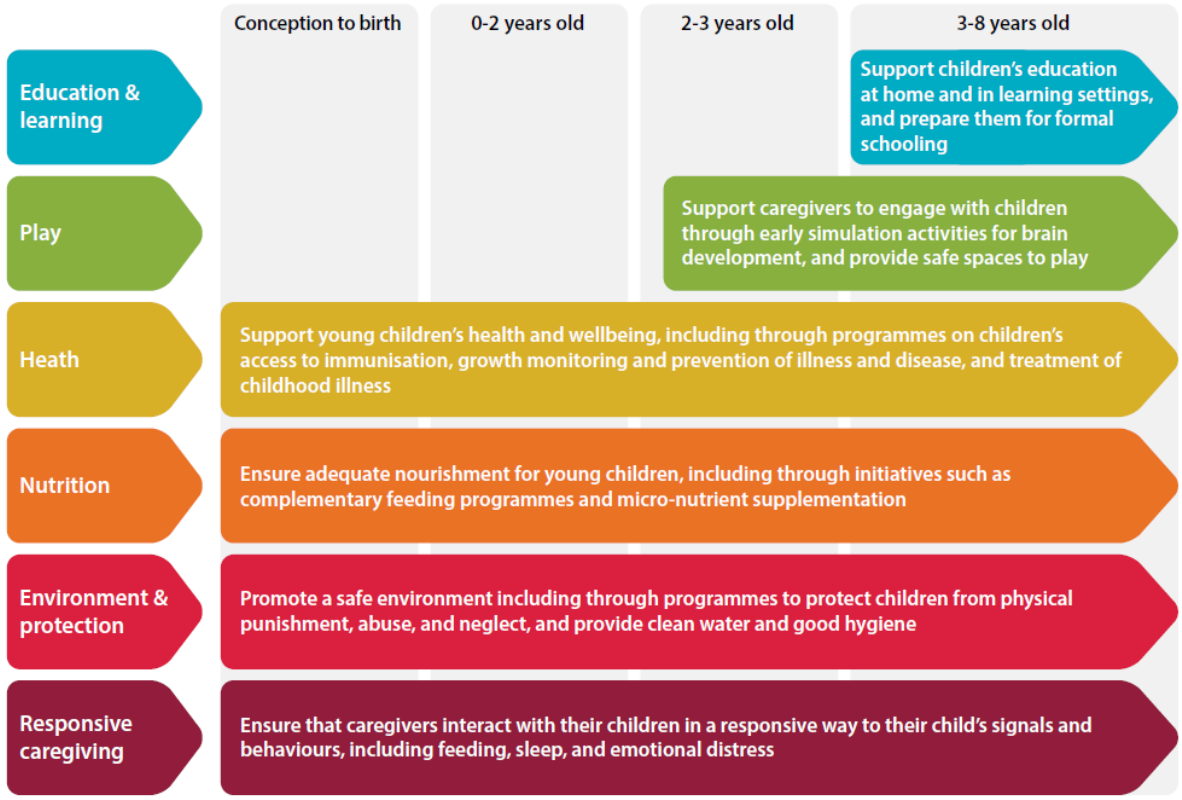
was spent on pre-primary education in 2022 (Zubairi & Rose, 2024). Increased funding, both national and international, will therefore make a difference for future generations.

3. Methods

This report summarises the findings from individual country mapping exercises in Kenya, Ghana, Uganda, and Tanzania. The findings from this country mapping are also compared to findings on publications identified from international databases. The Nurturing Care Framework for Early Childhood Development (2018) was used as the starting point for identifying and categorising sub-groups of ECD research in Africa (WHO & UNICEF, 2023). This framework was developed further based on other related frameworks by international organisations, including a specific category for play, and an extension of 'early learning' (0–3 years) - as used in the Nurturing Care Framework - to 'education', focusing on the pre-primary age group (0–8) (see Figure 1 and Table 2).

We focused on 0–3 years and extended this to include research outputs focusing on children up to 8 years, provided they were related to early childhood development. This was to ensure we captured early childhood education along with other components of early childhood development. In most countries, the pre-primary education age range is 4-6 years but could extend to age 8 (particularly where children are over age). The cutoff age was also informed by other related frameworks drawn from various institutions, as shown in Table 2.

Figure 1: An integrated approach to ECD



Source: Adapted from Zubairi & Rose (2021); WHO, UNICEF & World Bank Group, 2018.

Table 2: ECD components identified by selected international organisations

	UNICEF/WHO	ECDAN	UNESCO	World Bank
Education	Early Learning	Learning	Education/learning	Learning
Nutrition	Nutrition	Nutrition	Nutrition	Nutrition
Health	Health Care	Health	Health	Health
Caregiving	Responsive Caregiving	Responsive Caregiving	Parental/family support	Nurturing care
Play	Play, sing etc	Playful parenting		
Environment/ Protection	Protection from Harm	Safety and Security	Social Protection	Protection from exposure to stress
Age group	0 – 3 years	0 – 3 years	0 – 8 years	0 – 5 years

Source: Compiled from the organisations' websites.

The methodology of mapping research outputs analysed in this report is detailed in a protocol developed to guide this exercise (Williams et al., 2024). The method used for mapping the related publications from international databases is detailed in a

separate protocol (Iddrisu, Williams & Rose, 2024). The following criteria were adopted:

- Included research conducted by at least one researcher in one of the 48 SSA countries
- Published from January 2010
- Addressed at least one of the six ECD components (health, nutrition, environment and protection, education/early learning, responsive caregiving/parenting, and play)
- Focused on children aged 0-8 years (with a particular focus on the 0-3 age group).

We used several keywords for each ECD component, in combination or individually, depending on the platform. Examples of search strings used include:

- "early childhood development" OR "child growth" OR "child development" AND (country) AND (year)
- "early childhood education" OR "pre-primary" OR "pre-school" OR "early learning" AND (country) AND (year)
- "responsive parenting" OR "responsive care-giving" OR "parenting" OR "caregiving" AND (country) AND (year)
- "early stimulation" OR "play" OR "play space" AND (country) AND (year)
- "child health" OR "child wellbeing" OR "child well-being" OR "child growth" AND (country) AND (year)
- "child nutrition" OR "supplement" OR "child feeding" OR "child food" OR "breastfeeding" AND (country) AND (year)
- "malnutrition" OR "malnourish" OR "stunting" OR "wasting" OR "underweight" AND (country) AND (year)
- "child safety" OR "child protection" OR "water, sanitation and hygiene" OR "WASH" OR "water and sanitation" OR "hygiene" AND (country) AND (year)

Research outputs were identified from African Journals Online, institutional repositories, journals, Google Scholar, as well as unpublished literature databases, and websites of international charities and organisations implementing ECD interventions (for the detailed list, see individual country reports). Additional research outputs were provided by researchers through an online survey (this mostly targeted

education researchers in ESSA's database), and by searching academic and online profiles of identified researchers.

Research outputs of interest were journal articles, working paper series, PhD theses, books (chapters), and evaluation and intervention reports undertaken by universities, other research institutions and policy think tanks, NGOs, international aid agencies, government departments, and foundations. Searches were done separately for each of the focus countries. In some cases, publications in international journals were also identified through these country searches. Where this was the case, and particularly for the 2020-2022 period where a similar mapping exercise was conducted in international databases (Iddrisu, Adrupio & Rose, 2024), all the publications appearing in both the country-level and international databases were deleted from the country-level searches. For the 2010-2019 period, it is possible that some publications in international journals are included in the country-level searches.

Systematic searches were undertaken in four databases (Scopus, Web of Science, PubMed, and Dimensions) to identify publications in international journals across countries in sub-Saharan Africa for the period 2020-2022 (Iddrisu, Williams & Rose, 2024). This report provides comparisons between these publications and those identified through country-level searches, where relevant.

4. Findings

In this section, we present a comparative analysis of research outputs by country of research, the content, and the research authors. We focus on the attributes of the research outputs, research funding, collaboration and the researchers. We also make comparisons with publications from a similar mapping exercise on international databases.

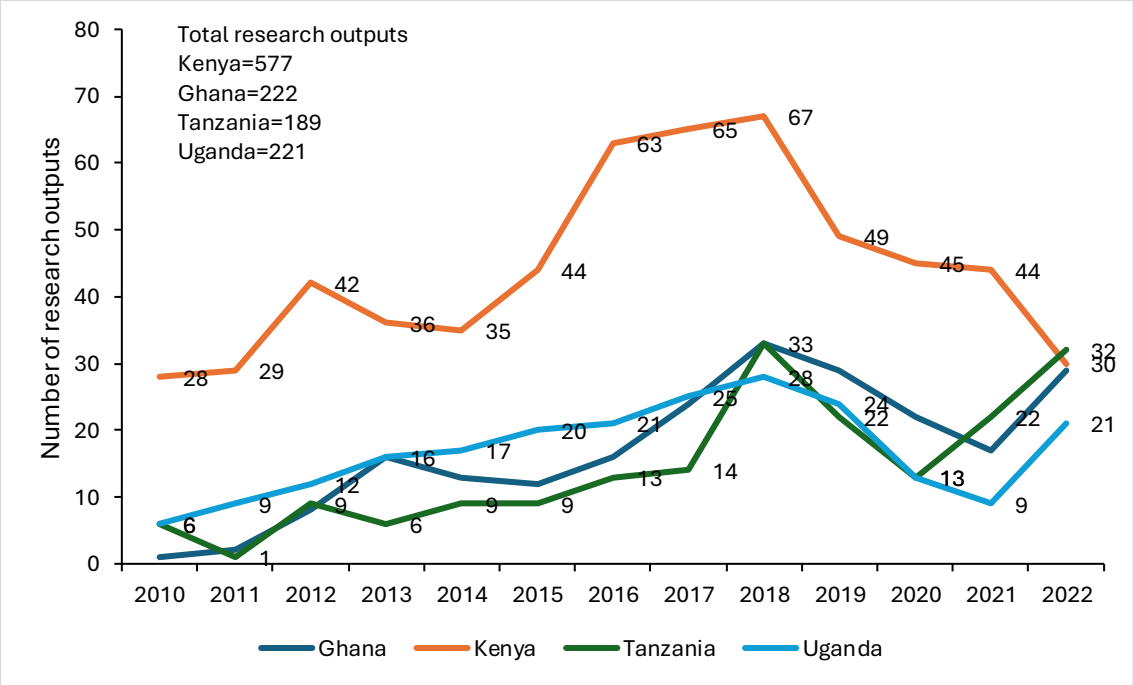
Research outputs trend and types

Figure 2 reveals an uneven pattern of research outputs across the four focus countries, ranging from a low of 189 in Tanzania to 576 in Kenya over the 13-year period: 2010 to 2022. In all countries, there was an increase of research outputs,

peaking in 2018. The decline observed since 2018 continued to 2020, with recoveries observed in 2021 for Ghana, Tanzania and Uganda to their 2018 levels. The drop in research outputs observed in Kenya from its initial higher starting point continued through to 2022, with a similar number of research outputs as Ghana and Tanzania by 2022. The decline for Kenya was mainly associated with a fall of journal articles.

The total number of research outputs identified in each country (and variability between them) could possibly reflect the use of repositories and journal databases within each country, which is also linked to internet connectivity (Baro & Nwabueze-Echedom, 2023). In Uganda, for example, Makerere University, one of the largest universities in the country, mostly uses their repository for uploading PhD theses and MPhil dissertations, but does not include academic staff journal articles and working papers.

Figure 2: Number of research outputs based on country-level searches (2010-2022)



Comparing the trend in research outputs in country-level searches with those published in journals identified by mapping of international databases for the period 2020 to 2022, we see a far larger number in international sources in each of the four countries. This difference is particularly notable for Ghana and Uganda, but even Kenya and Tanzania have more than double the number of publications in

international sources compared with those at the country-level. In terms of trends over the three-year period, we see a slight drop in 2021 followed by a marginal recovery in 2022 for research outputs in country-level searches in Ghana and Uganda. This could be related to the effects on productivity during COVID-19. Kenya shows a drop over the three-year period, while the numbers increase for Tanzania (Figure 3). The drop observed in Kenya for research outputs in country-level searches is even more marked for publications identified from international databases, while the other three countries show smaller variability (Figure 4).

Figure 3: Research outputs from country-level searches (2020-2022)

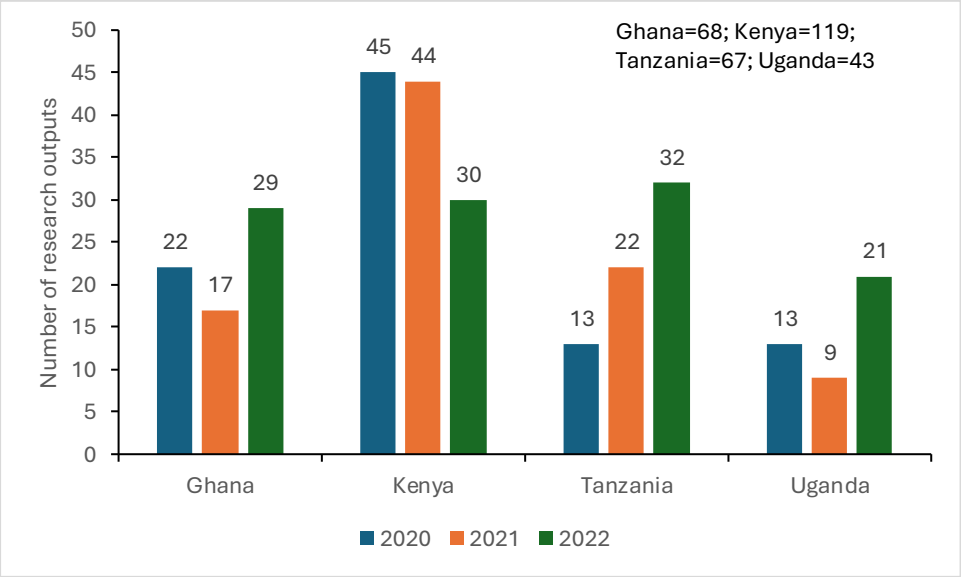
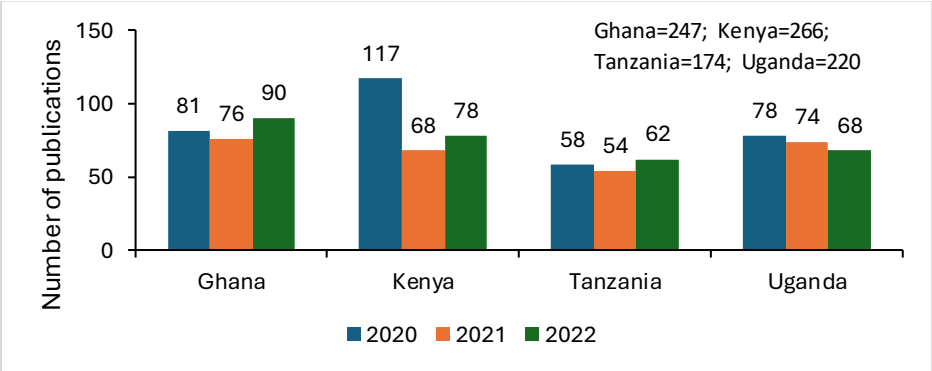


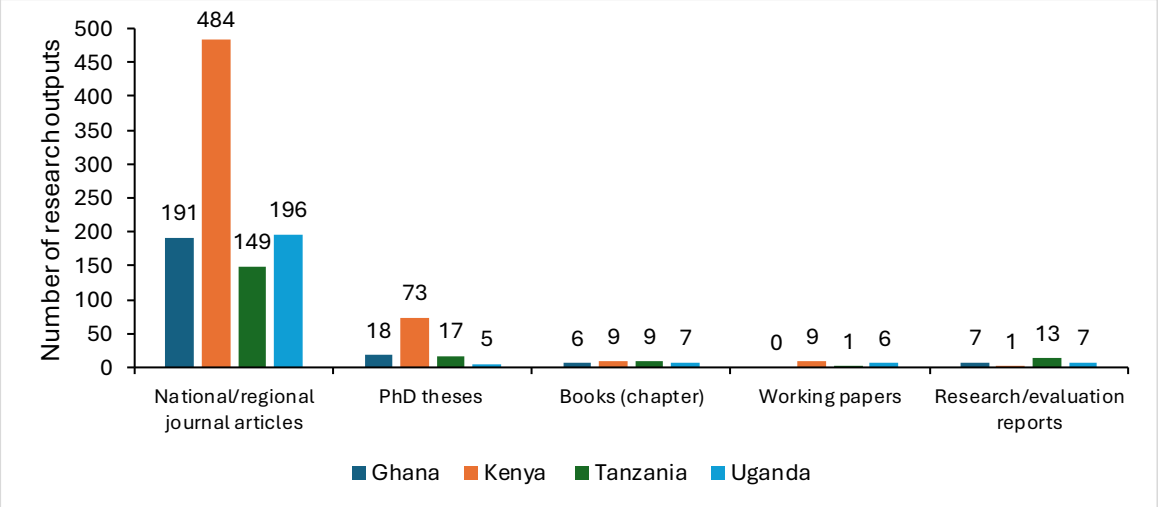
Figure 4: Publications from international database searches (2020-2022)



With respect to research outputs identified from country-level searches over the 13-year period, articles published in journals were identified as the main research output in all countries (Figure 5). In Kenya, there were a larger number of PhD theses identified compared to the other countries. For the other types of research outputs including books, working papers and research reports, Figure 5 shows marginal differences across countries, although slightly more research/evaluation reports were identified in Tanzania.

A greater number of journal articles could on one hand reflect the pressure to publish journal articles as a requirement for academic promotion in most academic institutions (Gray, 2013; Ssentongo, 2020). On the other hand, it could imply that other research outputs such as working papers and research or evaluation reports are not made available online, thus a large amount of research could be underutilised (Gray, 2013). The lack of visibility for some research outputs could also be because researchers are not incentivised to upload unpublished research to institution repositories, or funders restrict their distribution online. Evidence suggests the need to facilitate the use of these research outputs to policymakers and implementing communities by increasing their accessibility and visibility (Green, 2022).

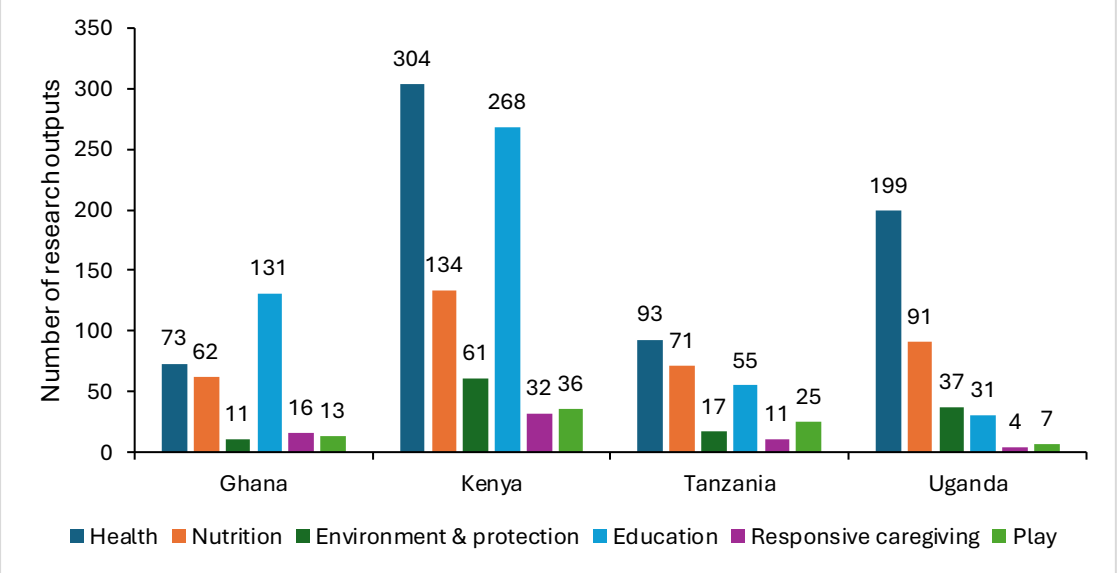
Figure 5: Type of research output based on country-level searches (2010-2022)



Research outputs by ECD component

In this section, we present an analysis of the research outputs by the components of ECD. In Kenya, Tanzania and Uganda, more than half of the research outputs focused on health, while education had the highest research outputs in Ghana (Figure 6). The higher number of education research outputs should be interpreted with caution, because it could reflect the greater engagement with education researchers given ESSA's focus on education. However, it does indicate that there is a sizeable number of health and education research outputs available.

Figure 6: Research outputs by ECD component from country-level searches (2010-2022)



The pattern of publications from the mapping of international databases during 2020-2022 shows that there are more publications in international journals than country-level research outputs.

Similar to the country-level research outputs, health had the highest number of publications in international journals across all countries. In contrast to the mapping of country-level searches for the same period, education was not as prominent (Figures 7 and 8). This might partly be explained by our outreach to education researchers within the four countries, but does suggest that there is more evidence

on education within the countries that could get missed through a focus on publications in international databases alone.

Figure 7: Research outputs by ECD component from country-level searches (2020-2022)

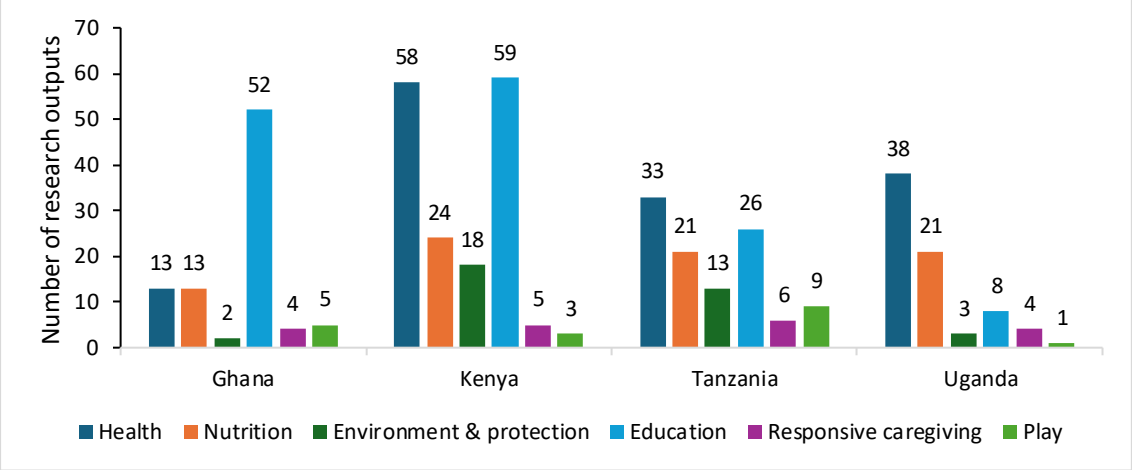
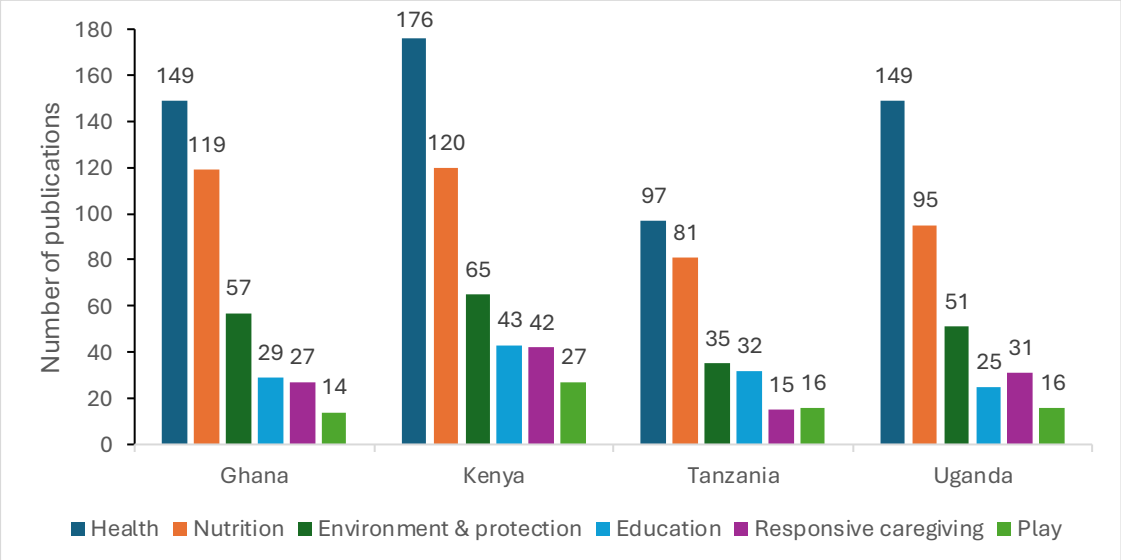


Figure 8: Publications by ECD component from international database searches (2020-2022)



A holistic approach to ECD is important when planning and assessing the needs of a child. Assessing children's physical, personal, social, emotional, cognitive and

spiritual wellbeing promotes a whole individual approach. It also helps to understand what they have or have not achieved, by looking at how the developmental areas link up and how progress in one area can affect progress in another areas (Lasi et al., 2007; Pitchik et al., 2021).

In all four countries, ECD research is mostly siloed, with minimal interconnection across components within research outputs. Where interconnections are evident, research outputs on health are more likely to connect with nutrition, while research outputs on education mainly interconnect with play. In Kenya and Uganda, only one study focused on all six ECD components. In contrast, six research outputs in Kenya and five in Uganda, focused on four components, excluding play, and environment and protection. In Ghana, only one study covered all components and three intersected across education, health and nutrition. Tanzania had four research outputs that intersected across education, health, nutrition and environment, but none that focused on ECD holistically.

Research funding

Although the member states of the African Union committed to spending 1 percent of their GDP on research and development (African Union, 2007), the actual funding committed by the sub-continent stands at only 0.33 percent. This is in sharp contrast to the global average of 1.9 percent (UNESCO Institute for Statistics, 2024).

Access to funding for research outputs identified from country-level searches varies markedly across countries over the thirteen-year period 2010 to 2022. Only around one in four research outputs on ECD were funded in Ghana, increasing to just over one third in Kenya. A greater proportion of ECD research outputs identified from country-level searches reported that they received funding in Tanzania and Uganda, with half and almost two thirds, respectively (Figure 9).

Articles in internationally recognised journals were more likely to receive funding over the three-year period for which data were available (2020-2022) across all the countries (Figure 10). As with research outputs from country-level searches, articles in internationally recognised journals were least likely to report receiving funding in Ghana (24 percent for country-level research and 44 percent for international). By

contrast, a greater proportion of internationally recognised journal articles received funding in Kenya (71 percent) compared with those identified from country-level searches (36 percent). The difference in funding received for research outputs identified from country-level searches and those from international databases was less marked in Tanzania and Uganda.

Figure 9: Funding status based on country-level searches (2010-2022)

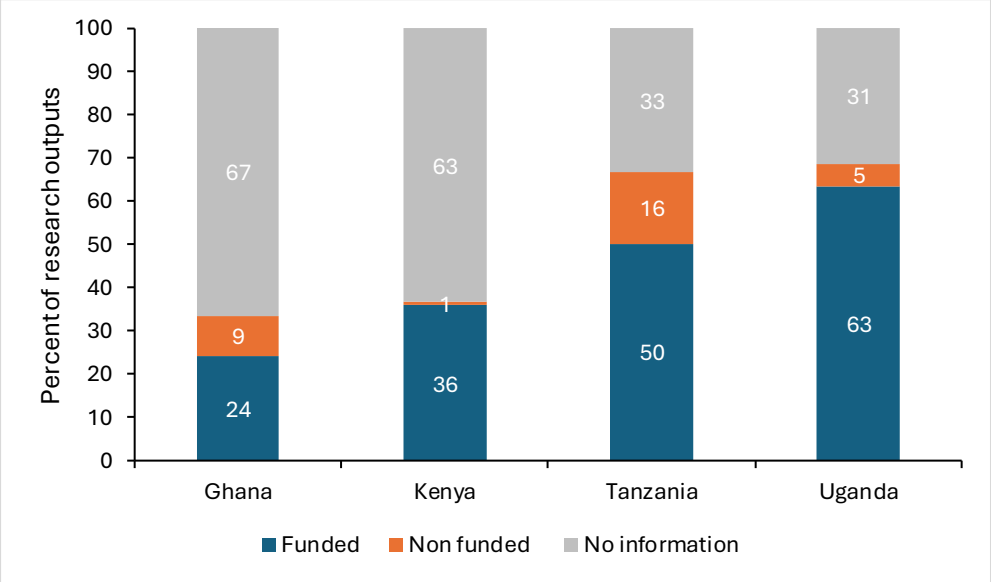
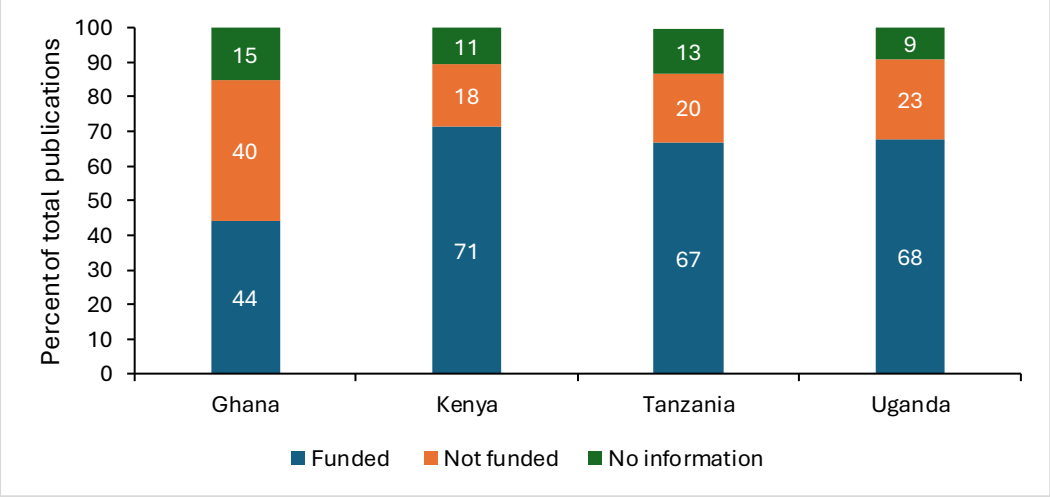


Figure 10: Funding status based on international database searches (2020-2022)



In terms of the funding status of publications by ECD component, health and nutrition recorded a higher proportion of research outputs from country searches on funding across the four countries (Figure 11). For publications identified from international databases, funding is generally higher across ECD components, with more than 40 percent reporting funding for all countries except in some components in Tanzania. In Kenya, this rises to more than 60 percent of all components (Figure 12).

Figure 11: Funding status by ECD component based on country-level searches (2020-2022)

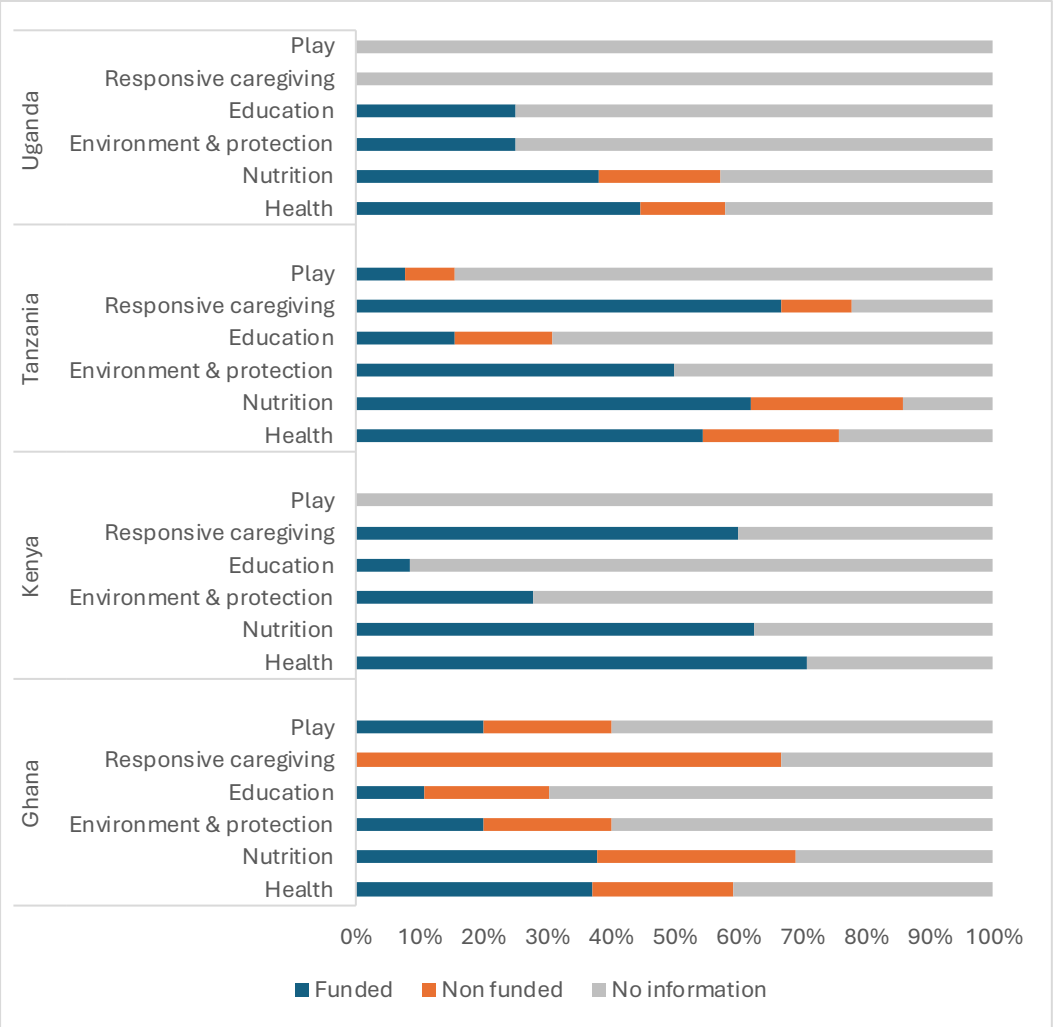
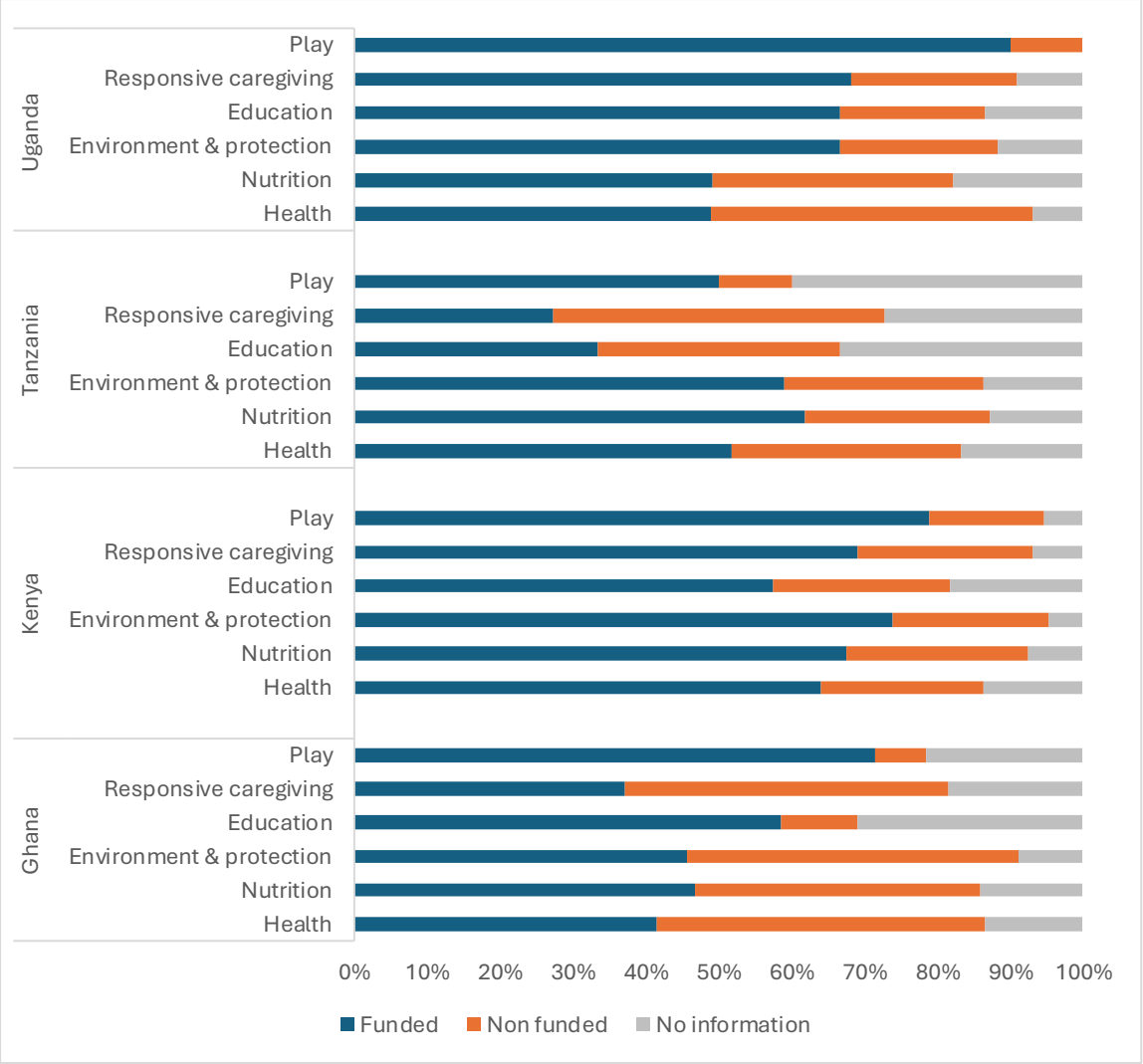


Figure 12: Funding status by ECD component based on international database searches (2020-2022)



For Uganda, which had a higher proportion of research outputs receiving funding, international and philanthropic organisations were the most common funders, with a minimal role played by the government, local organisations and internal institutions, including universities (Figure 13). A similar pattern is evident in Ghana and Kenya, with research outputs in Kenya receiving a larger proportion of funding from philanthropic organisations compared to other countries. In Tanzania, government and internal institutions played a bigger role in ECD research funding, with 12 percent and 15 percent, respectively.

For the publications identified from international databases, international organisations and philanthropists accounted for more than 90 percent of all funding types across the four countries (Figure 14).

A similar pattern of greater funding by international organisations and external philanthropy is apparent across the different ECD sub-components, even more so for publications in international journals.

Figure 13: Funding type based on country-level searches (2010-2022)

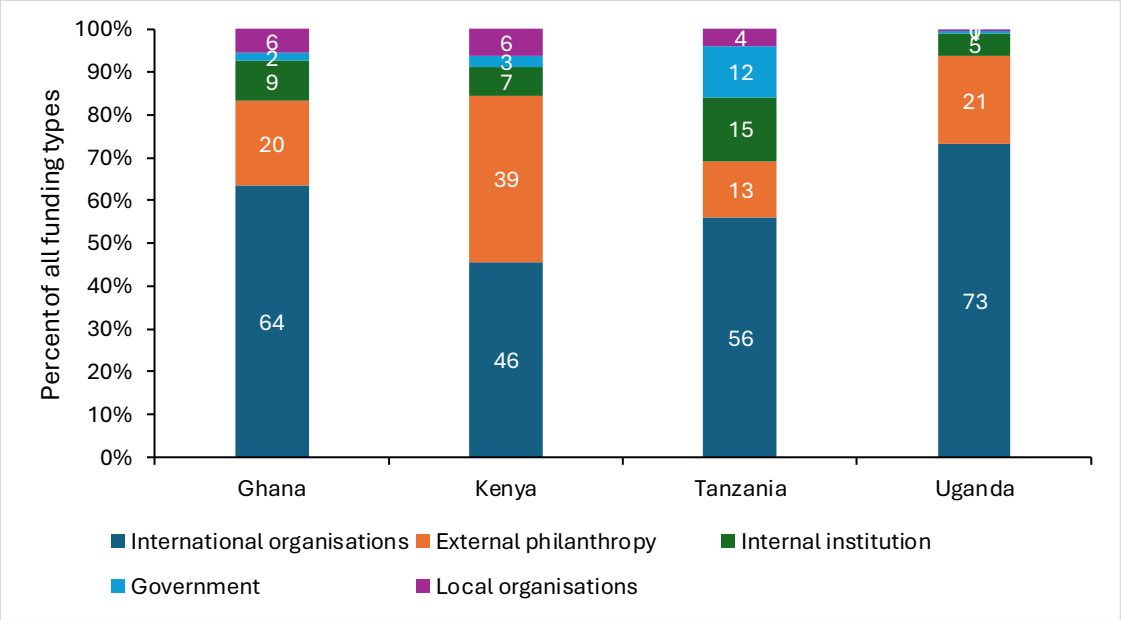
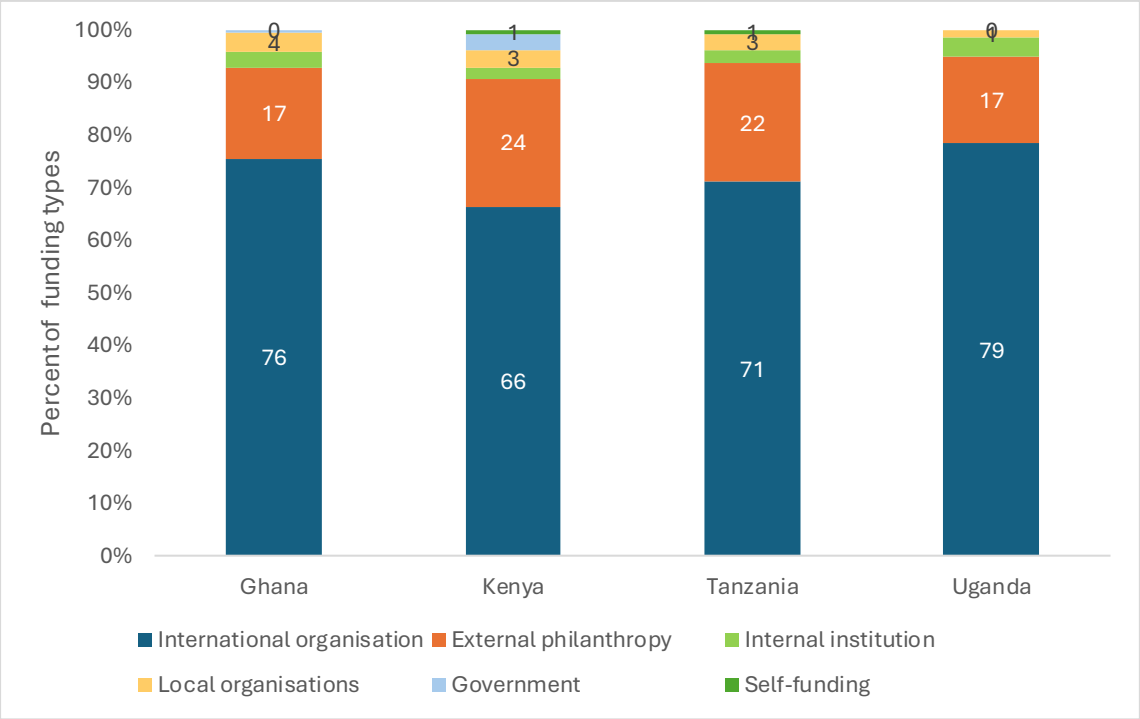


Figure 14: Funding type based on international database searches (2020-2022)



With respect to specific funders of research outputs from country-level searches, the top funders in Ghana and Uganda are large international organisations and philanthropists including Bill & Melinda Gates Foundation, National Institute of Health, and the UK Medical Research Council. In Tanzania, the government is the top funder through the higher education student loans, research funding council and ministries, while Kenya has a mix of both international organisations and philanthropists, but also local organisations including the DELTAS Africa Initiative (Table 3).

For publications from international databases, there is not much variation across countries, with the top funders being a mix of international organisations and philanthropist including Bill and Melinda Gates foundation, National Institute of Health, USAID, Wellcome Trust and UK Medical Research Council among others (Table 4).

Table 3: Most common funders of research outputs identified from country-level searches (2010-2022)

Ghana	Kenya	Tanzania	Uganda
Bill & Melinda Gates Foundation	Wellcome Trust	Government of Tanzania	National Institute of Health
USAID	Bill & Melinda Gates Foundation	UNICEF	UK Medical Research Council
World Bank	National Institute of Health	Nelson Mandela African Institution of Science and Technology	World Food Programme
UBS Optimus Foundation	National Commission for Science, Technology and Innovation	Bill & Melinda Gates Foundation	Wellcome Trust
IDRC, Jacobs Foundation, Lego Foundation	DELTAS Africa Initiative	Biodiversity International, Kampala Regional Office	Nestlé Foundation

Table 4: Top funders of publications identified from international database searches (2020-2022)

Ghana	Kenya	Tanzania	Uganda
Bill & Melinda Gates Foundation	Bill & Melinda Gates Foundation	Bill & Melinda Gates Foundation	National Institute of Health
USAID	Wellcome Trust	National Institute of Health	USAID
Children's Investment Fund Foundation	USAID	USAID	Bill & Melinda Gates Foundation
Global affairs Canada	UK Medical Research Council	Fogarty International Centre	UK Medical Research Council
UNICEF	National Institute of Health	Eunice Kennedy Shriver National Institute of Child Health and Human Development	Wellcome Trust

Inequality included in the research outputs

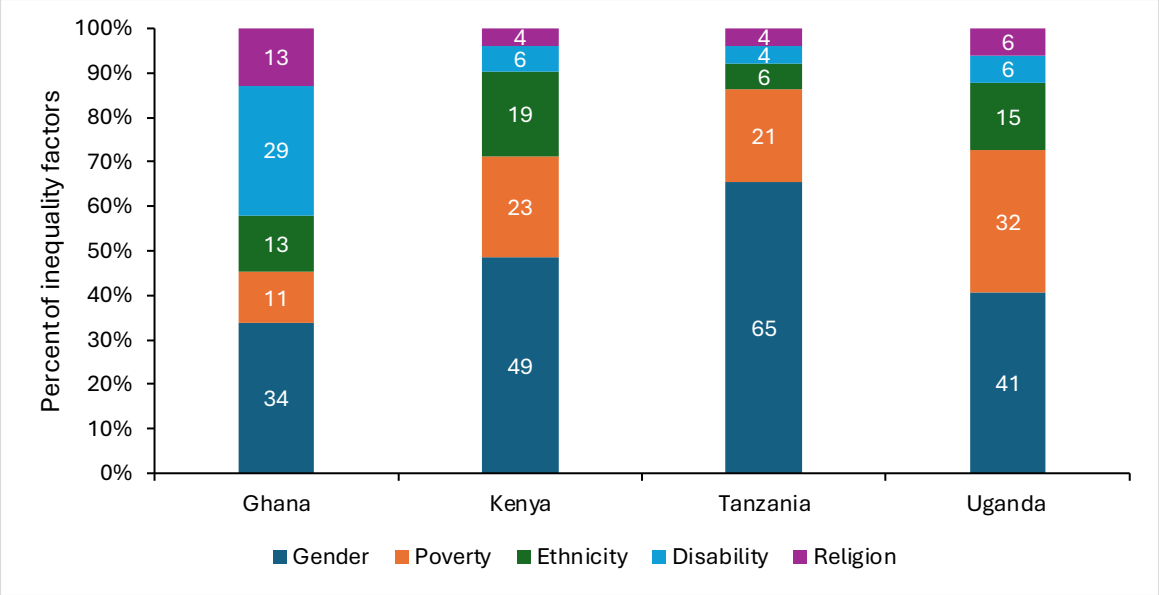
To explore inequality in research outputs, we assessed whether findings included analysis by socio-economic status (poverty), gender, disability, ethnicity and religion of participants. Just over half (54 percent) of the research outputs in Tanzania included an assessment of inequality, while 27 percent included inequality analysis in Ghana. In Kenya and Uganda, the corresponding numbers were 37 percent and 72 percent, respectively.

Where information on inequality was provided, gender was the most common, ranging from 34 percent in Ghana to 65 percent of all included forms of inequality in Tanzania (Figure 15). In the other three countries, poverty was the second most common area of inequality included. Disability and religion were the least commonly included, except in Ghana where after gender, disability was the second most common (29 percent).

Research outputs from country-level searches were less likely to account for inequality than publications from international databases. Around 90 percent of publications from international databases in the four countries accounted for inequalities (88 to 95 percent).

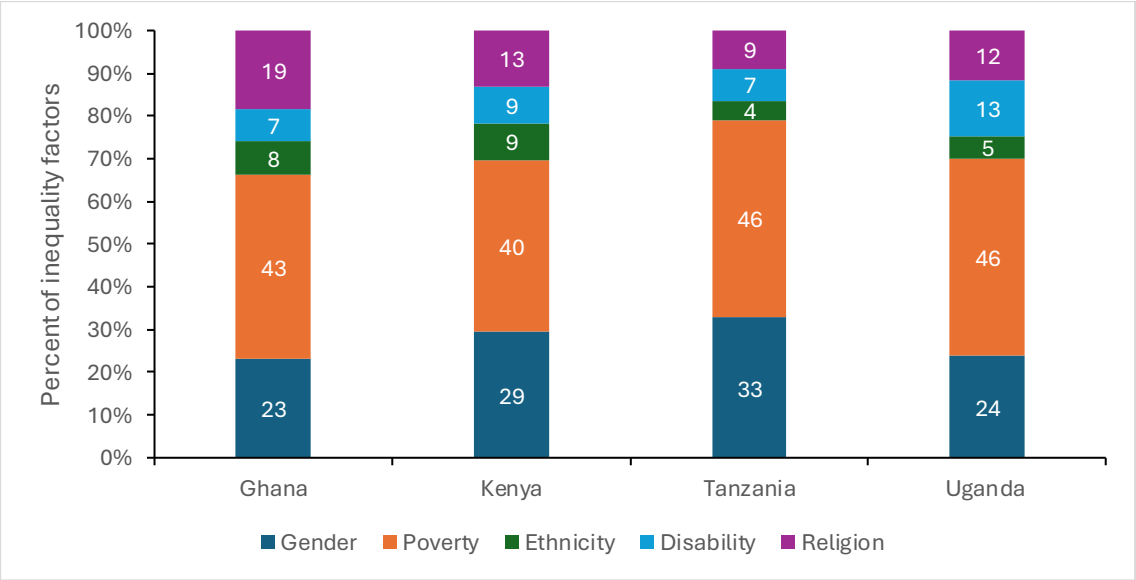
There is less country variation in publications from international databases compared to the country-level searches, although publications in Ghana were more likely to include inequality based on religion while Tanzania were least likely. In addition, disaggregation by poverty was most common, while ethnicity was the least common inequality (Figure 16).

Figure 15: Inequality factors included in research outputs based on country-level searches (2010-2022)



Note: Some research outputs included more than one inequality factor.

Figure 16: Inequality factors included in publications based on international database searches (2020-2022)



Note: Some publications included more than one inequality factor.

With respect to whether the research was based in rural and/or urban areas, the proportion that included information on the location of the research ranged from 75 percent in Ghana to 42 percent in Uganda. Among the research outputs that included this information, more than one in four were conducted in rural areas across the four countries (Figure 17). This is similar to research published in international journals, although only 13 percent focused on rural areas in Ghana (Figure 18). The location of the research is important when interpreting results, as urban or rural areas may present different circumstances that could affect education opportunities, with rural areas often facing greater deprivation.

Figure 17: Research location based on country-level searches (2010-2022)

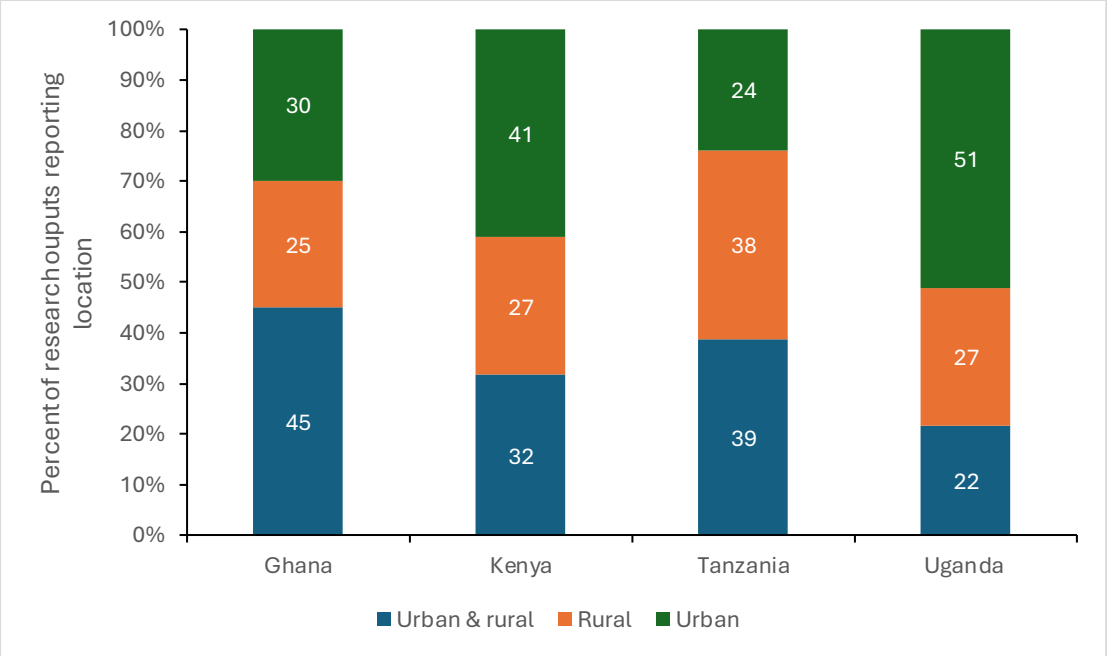
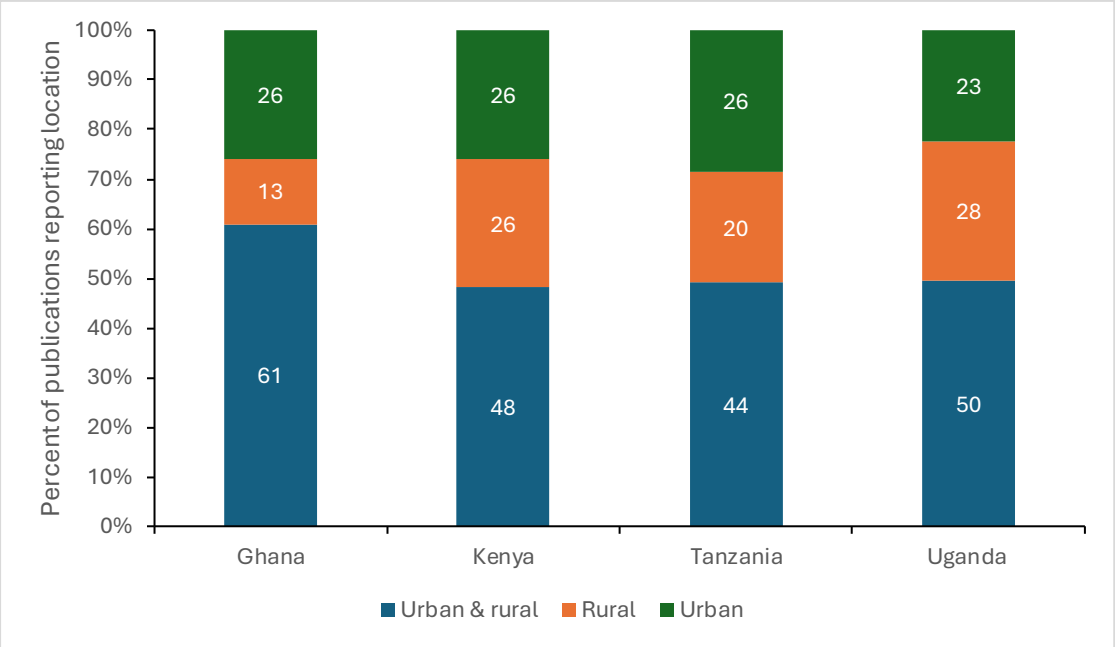


Figure 18: Research location based on international database searches (2020-2022)



Gender of ECD researchers

African countries have the lowest number of researchers relative to their population compared with other countries globally. In 2021, sub-Saharan Africa had approximately 95.7 researchers per million people compared to 625 in Latin America and the Caribbean, and 4,049 in Europe and North America. Among the four focus countries, large disparities exist, ranging from a low of 19 (Tanzania) to high of 169 (Kenya) researchers per million people, based on the latest available data (Table 5) (UNESCO Institute for Statistics, 2024). Women account for a minority of these researchers in SSA. On average, three of every 10 people employed in research and development (both full-time and part-time) are women (UNESCO, 2020).

Table 5: Female researchers as a percentage of total researchers (latest year)

Country	Researchers per million people	% of women researchers
Ghana	87 (2015)	26.2 (2016)
Kenya	169 (2022)	38.7 (2022)
Tanzania	19 (2013)	29.8 (2014)
Uganda	29 (2014)	29.8 (2015)
sub-Saharan Africa	95.7 (2021)	31.3 (2021)

Source: UNESCO, 2024; World Bank, 2024.

In our analysis of the gender of authors included in the research outputs, there were more men than women in three countries with exception of Kenya, where women represented 52 percent of all ECD researchers in the identified research outputs (Figure 19). Ghana had the least number of women authors at 36 percent.

Comparing authorship between country-level searches and international databases, we note that there was generally a lower proportion of female authors publishing in international journals than in country-level searches (Figure 20). This could imply that women have more limited access to publishing opportunities in international journals compared to men. There is no clear pattern of author gender by ECD sub-components.

Figure 19: Researcher gender based on country-level searches (2010-2022)

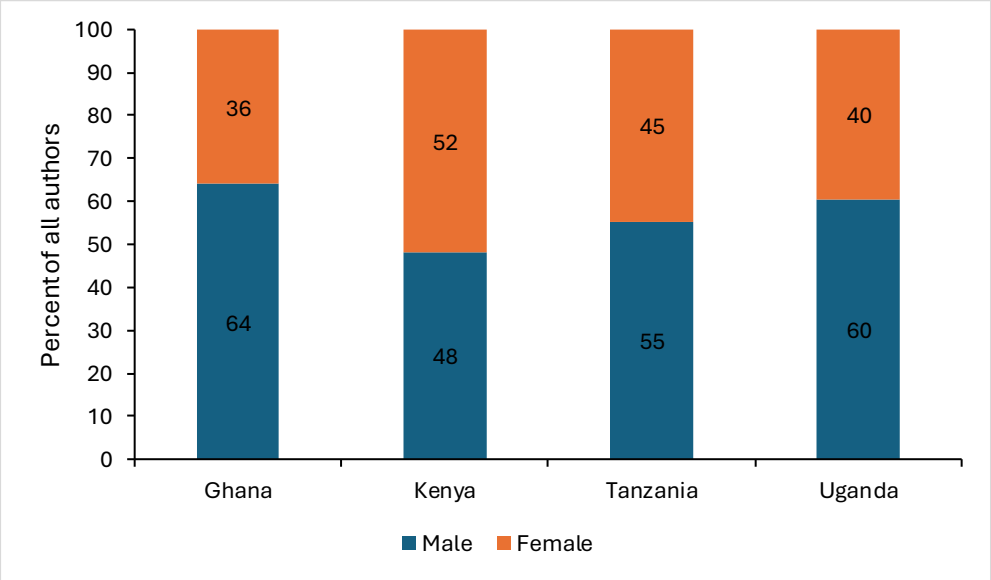
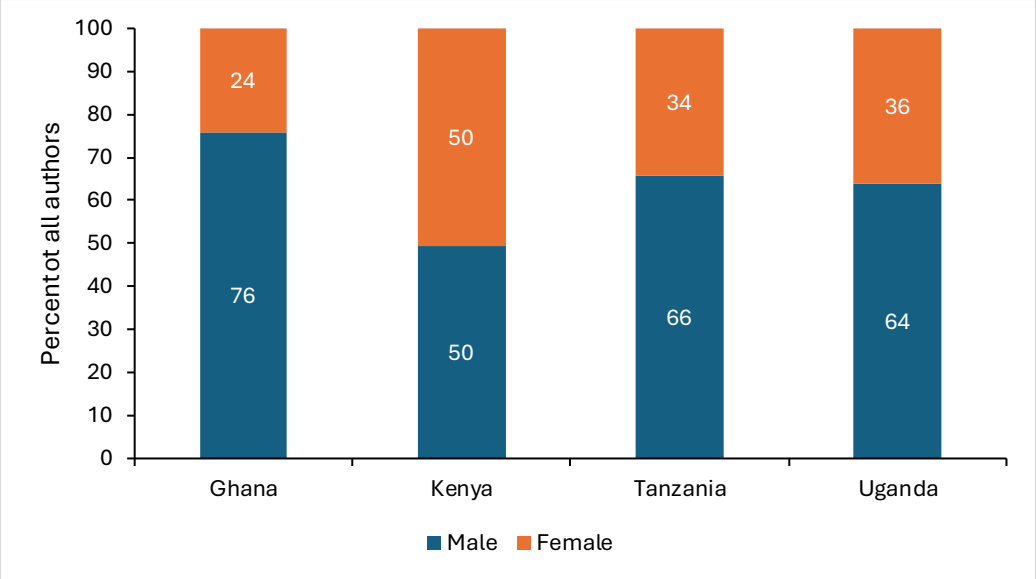


Figure 20: Researcher gender based on international database searches (2020-2022)



Researcher institutional affiliation

To analyse the institutions in which the researchers were based, we counted every time an institution was mentioned, irrespective of the number of authors based in the same institution. In Table 6, we show the top five institutions in each country for both country-level and international databases searches. Notably, institutions in Kenya are more prolific in research production compared to other countries, particularly in the country-level searches. Further, there were no major differences in institutions research output between country-level searches and international databases searches except in Kenya, where institutions identified in county-level searches had a greater number of outputs than in international databases. This could partly be attributed to the high number of publications in Kenya compared to the other countries. It could also be an indication of high collaborations between researchers in different institutions within the country. Another notable difference is that, while the most productive institutions in Kenya are research institutes including the Kenya Medical Research Institute (KEMRI) and the African Population and Health Research Centre (APHRC), universities dominate in the other three countries. Other than Tanzania, the most productive institution in each country is the same for both country-level searches and international databases.

Table 6: Institutional affiliation of researchers based on country-level (2010-2022) and international database searches (2020-2022)

Country-level searches (2010-2022)		International databases (2020-2022)	
Institution	*No.*	*Institution*	*No.*
Ghana			
University of Ghana	132	University of Ghana	174
University of Cape Coast	114	University of Cape Coast	136
University of Education Winneba	72	University for Development Studies	48
Kwame Nkrumah University of Science & Technology	28	University of Health and Allied Health Sciences	42
University for Development Studies	22	Ghana Health service	39
Kenya			
Kenya Medical Research Institute	485	Kenya Medical Research Institute	164
Kenyatta University	321	APHRC	75
University of Nairobi	188	University of Nairobi	72
APHRC	174	Moi University	52
Moi University	117	Aga Khan University	44
Tanzania			
Sokoine University of Agriculture	76	Muhimbili University of Health and Allied Sciences	77
University of Dodoma	59	University of Dodoma	32
Nelson Mandela African Institution of Science & Technology	47	Kilimanjaro Christian Medical University College	28
Muhimbili University of Health and Allied Sciences	38	Haydom Lutheran Hospital	25
Catholic University of Health and Allied Sciences	36	National Institute for Medical Research	22
Uganda			
Makerere University	290	Makerere University	234
MRC/Uganda Virus Research Institute	89	Mbarara University of Science & Technology	37
Joint Clinical Research Centre	55	Ministry of Health, Uganda	24
Mbarara University of Science & Technology	34	Uganda Virus Research Institute and LSHTM	22
Mbale Regional Referral Hospital	27	Kampala International University	21

Collaboration of researchers within and outside SSA

International research collaborations can have a significant impact on research productivity where researchers publish as part of international research teams (DFID, 2019). We therefore explored collaboration among researchers within each of the four countries, as well as the extent of their collaborations across SSA countries and with researchers in countries outside SSA (Figure 21).

Uganda exhibited the highest proportion of collaborations across SSA countries, while Tanzania had the lowest, which could partly be attributed to there being a

higher proportion of single authored research outputs. Uganda had the highest proportion of collaborations with authors outside SSA countries (33 percent) while Kenya had the lowest (23 percent). Taken together with the findings above that most of ECD research in Uganda is funded, and that more than three quarters is funded by external institutions, this may imply a high level of international engagement in the country's ECD research and knowledge production activities.

With respect to publications in international databases, the most prevalent collaboration type was with authors outside SSA (Figure 22). Only 5 percent or less of the publications did not report on collaboration, as opposed to the country-level searches, which ranged from 5 percent in Uganda to 32 percent of total research collaborations in Tanzania.

Figure 21: Collaboration between researchers within and outside SSA based on country-level searches (2010-2022)

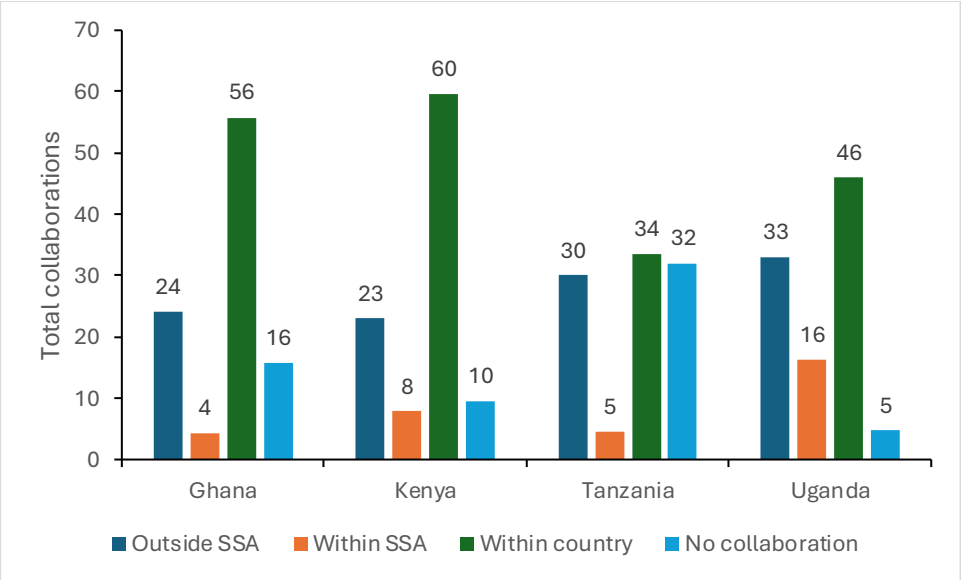
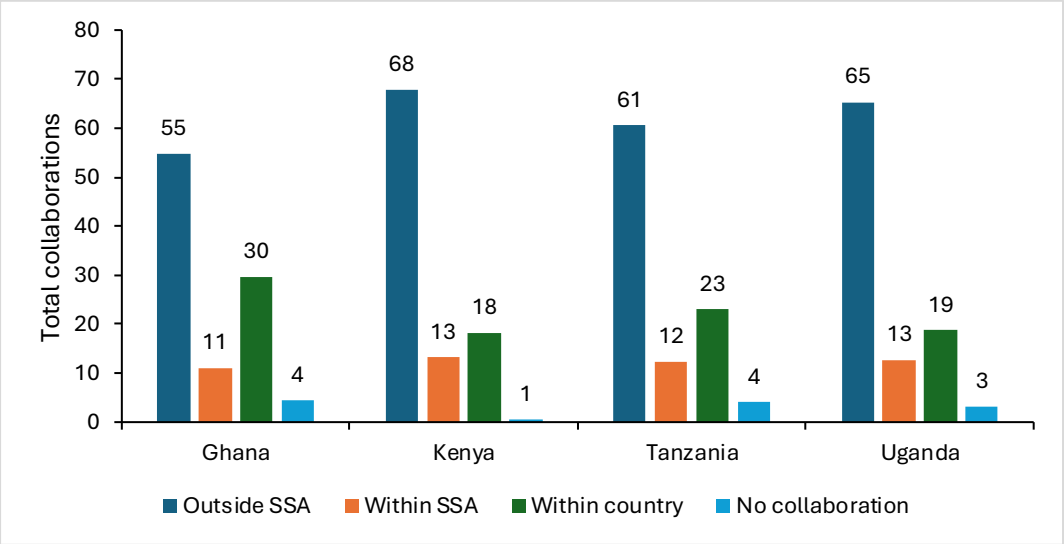


Figure 22: Collaboration between researchers within and outside SSA based on international database searches (2020-2022)



With respect to collaborations by ECD component, Kenya had the highest collaborations within the country across all ECD components, while Uganda had the highest collaborations across countries within SSA (Figure 23). Researchers in Uganda were also more likely to report lack of collaboration across ECD components, with responsive caregiving report no collaboration at all. Comparing the four countries, Tanzania had the highest collaborations outside SSA across the ECD components.

Based on publications from international databases, collaborations outside SSA were the most common type of collaboration, with minimal differences across the four countries (Figure 24). Among the four countries, Kenya shows the higher collaborations within SSA countries across all ECD components. Comparing country-level searches and international databases, publications in the later are more likely to report collaborations outside SSA than research outputs in country-level searches. Generally, very few publications did not report any form of collaborations.

Figure 23: Collaboration within and outside SSA by ECD component based on country-level searches (2020-2022)

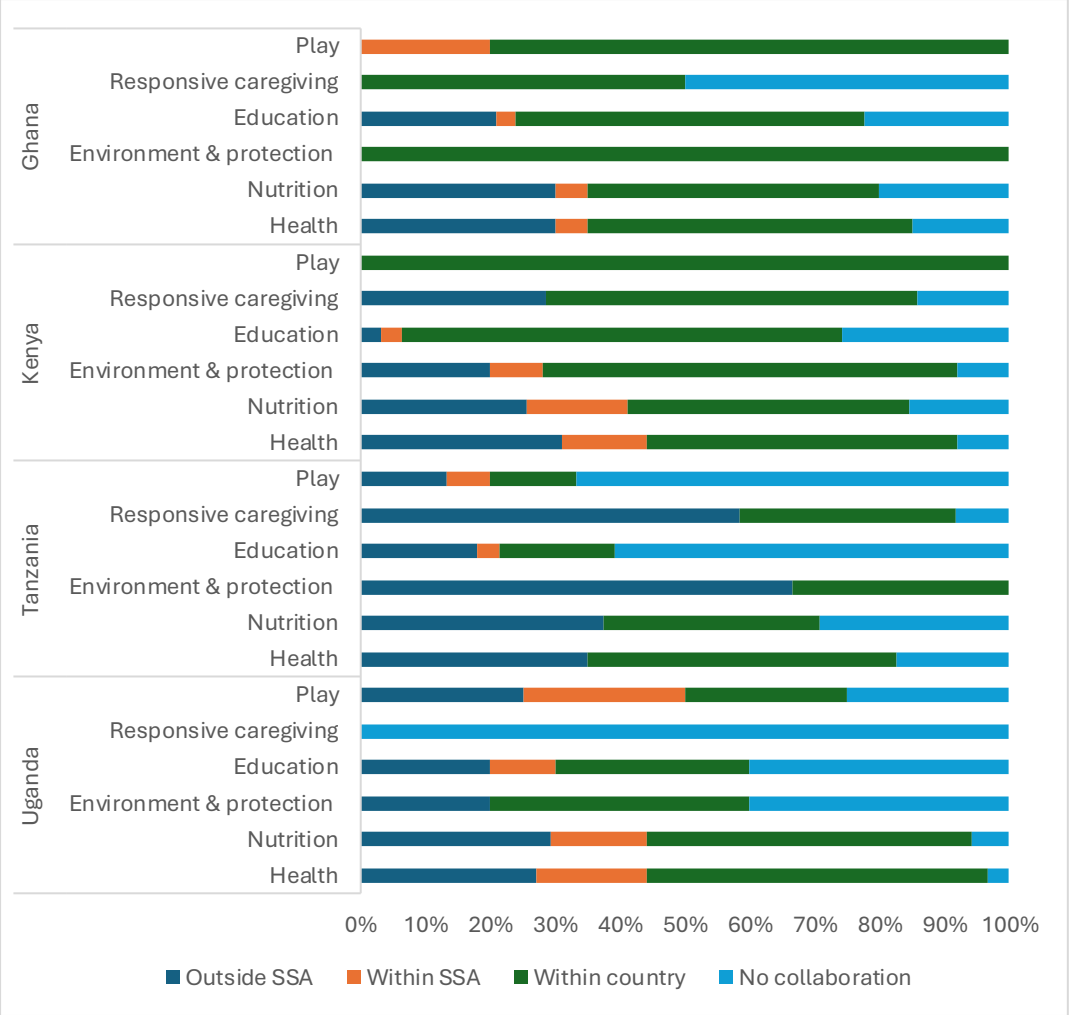
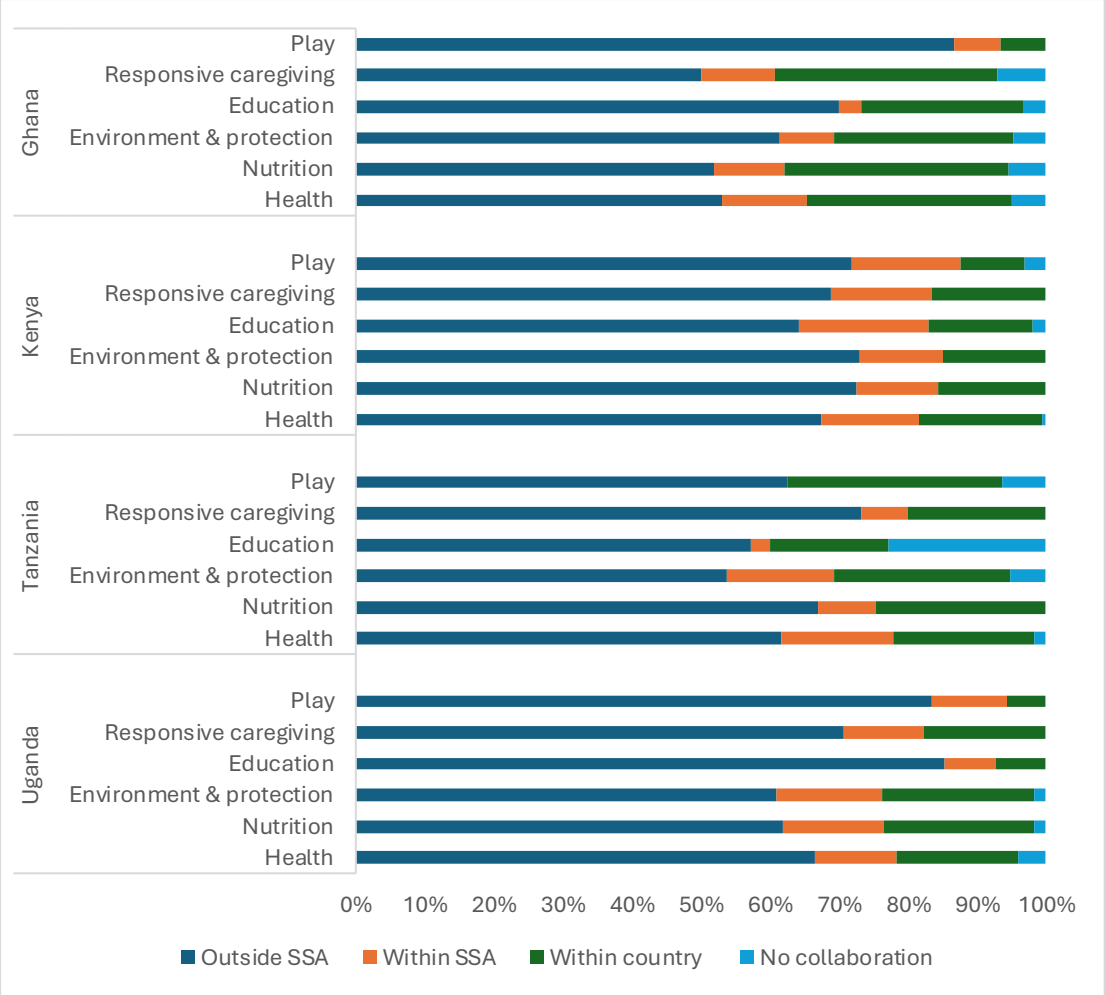


Figure 24: Collaboration within and outside SSA by ECD component based on international database searches (2020-2022)



5. Conclusion and recommendations

Based on this mapping exercise of country-level research outputs, we have observed that research on ECD in the four countries has increased since 2010, although it is unevenly distributed across the six ECD components, with health and education having the highest number of research outputs (except in Ghana). This contrasts with publications in international databases, where publications on health and nutrition outnumber other ECD components. The higher number of research outputs on education from country-searches could partly be due to our greater ability to identify education researchers.

There are far more publications identified from international databases for each country compared to country-level searches. The data also shows women are underrepresented in research in general, and that most research on ECD conducted in the four countries is unfunded except in Uganda. Our analysis also highlights that there is minimal collaboration among researchers across SSA countries, which is perhaps an indication of limited knowledge exchange and learning in the region. Compared to publications in international databases, research outputs in country-level searches are less likely to be funded, women authors are less likely to be published in international journals, and researchers are more likely to collaborate within their country.

Recommendations

With the recognition that ECD should have a multisectoral and a multidisciplinary approach, these recommendations are targeted to all stakeholders in this area including ECD researchers, implementing organisations, governments, NGOs and bilateral/multilateral funders.

- **Increase funding for ECD research:** Allocate more funding particularly on components with the highest funding gaps including responsive caregiving, education and play. African countries can no longer depend only on external funders. Governments as well as the private sector need to play a larger role in investing in research within countries. Funding should be coordinated across ECD components to ensure they are all well-funded and promote a holistic understanding of children's development in their early years.
- **Develop collaborative research communities:** Foster strong collaboration between research communities across countries to share lessons, knowledge, and mentorship opportunities. Having such platforms to foster, enhance and expand collaborations will not only cultivate local capacity, but also provide a diversity of perspectives and approaches from different countries.
- **Support full participation of women and early career researchers:** Increase opportunities for women and early career researchers to publish in international journals.

- **Increase research visibility and data availability**: Develop functional online repositories to facilitate the dissemination of evidence, including working papers, and research and evaluation reports.

References

African Union. (2007). Assembly of the African Union Eighth Ordinary Session 29 – 30 January *2007 Addis Ababa, Ethiopia: Decisions and Declarations*. Addis Ababa, Ethiopia: African Union. https://au.int/sites/default/files/decisions/9556-assembly_en_29_30_january_2007_auc_the_african_union_eighth_ordinary_session.pdf

African Union. (2015). *The Continental Education Strategy for Africa (CESA 2016 – 2025)*. https://ecosocc.au.int/sites/default/files/files/2021-09/continental-strategy-education-africa-english.pdf

Asare, S., Mitchell, R., & Rose, P. (2021). How accessible are journal articles on education written by sub-Saharan Africa-based researchers? *Development and Change*, *52*(3), 661-669. https://doi.org/10.1111/dech.12639

Baro, E. E., & Nwabueze-Echedom, A. U. (2023). An evaluation of institutional repository development in African universities. *IFLA Journal*, *49*(1), 18-38. https://doi.org/10.1177/03400352221089672

Black, M. M., Walker, S. P., Fernald, L. C. H., Andersen, C. T., DiGirolamo, A. M., Lu, C., McCoy, D. C., Fink, G., Shawar, Y. R., Shiffman, J., Devercelli, A. E., Wodon, Q. T., Vargas-Barón, E., & Grantham-McGregor, S. (2017). Early childhood development coming of age: science through the life course. *The Lancet*, *389*(10064), 77-90. https://doi.org/https://doi.org/10.1016/S0140-6736(16)31389-7

Collyer, F. M. (2018). Global patterns in the publishing of academic knowledge: Global North, global South. *Current Sociology*, *66*(1), 56-73. https://doi.org/10.1177/0011392116680020

DFID. (2019). *Strengthening Research Institutions in Africa (SRIA) inception Analysis: A synthesis report*. https://assets.publishing.service.gov.uk/media/5ef4ac4986650c12a0c778a7/Synthesis_report__Final_revised_v3_clean_.pdf

Gray, E. (2013). Research for development and the role of 'grey literature' in southern African research production. *Ecancermedicalscience*, *7*, ed22. https://doi.org/10.3332/ecancer.2013.ed22

Green, T. (2022). Grey Literature is Booming. It's Time to Turn it into an Asset. *Against the Grain*, *34*(6), 18–20. https://issuu.com/against-the-grain/docs/dec22-jan23_v34-6/s/18327456

Iddrisu, D.H., Williams, E.M., & Rose, P. (2024). *Literature search protocol: Mapping early childhood development publications in international databases by researchers located in sub-Saharan Africa.* REAL Centre, University of Cambridge and ESSA. https://www.educ.cam.ac.uk/centres/real/researchprojects/ongoing/mapping-education-sub-saharan-africa/Literature-search-protocol-ECD-international-databases.pdf

Iddrisu, D.H., Adrupio, S., & Rose, P. (2024). *Mapping early childhood development publications in sub-Saharan Africa: Report on analysis from international satabases*. REAL Centre, University of Cambridge and ESSA.

Lasi, S., Nadeem, S., & Fatima, I. (2007). Quality in early childhood education: Assessing early child development - a holistic approach for ages 3-6 years. In *Quality in education: Teaching and leadership in challenging times* (pp. 295-305). http://ecommons.aku.edu/book_chapters/81

Marincola, E., & Kariuki, T. (2020). Quality research in Africa and why it is important. *ACS Omega*, *5*(38), 24155-24157. https://doi.org/10.1021/acsomega.0c04327

Naumann, I. K. (2018). Early childhood education and care policy: Beyond quantity and quality, for human development. In C. Trevarthen, J. Delafield-Butt, & A.-W. Dunlop (Eds.), *The child's curriculum: Working with the natural voices of young children* (pp. 235-255). Oxford University Press. https://doi.org/10.1093/oso/9780198747109.003.0013

Nurturing Care for Early Childhood Development. (2023). *Country Profiles for Early Childhood Development*. Retrieved April 2024 from https://nurturing-care.org/resources/country-profiles

Pitchik, H. O., Tofail, F., Rahman, M., Akter, F., Sultana, J., Shoab, A. K., Huda, T. M. N., Jahir, T., Amin, M. R., Hossain, M. K., Das, J. B., Chung, E. O., Byrd, K. A., Yeasmin, F., Kwong, L. H., Forsyth, J. E., Mridha, M. K., Winch, P. J., Luby, S. P., & Fernald, L. C. (2021). A holistic approach to promoting early child development: A cluster randomised trial of a group-based, multicomponent intervention in rural Bangladesh. *BMJ Glob Health*, *6*(3). https://doi.org/10.1136/bmjgh-2020-004307

Ssentongo, J. S. (2020). 'Which journal is that?' Politics of academic promotion in Uganda and the predicament of African publication outlets. *Critical African Studies*, *12*, 283-301. https://doi.org/10.1080/21681392.2020.1788400

Tarkang, E. E., & Bain, L. E. (2019). The bane of publishing a research article in international journals by African researchers, the peer-review process and the contentious issue of predatory journals: a commentary. *Pan African Medical Journal*, *32*, 119. https://doi.org/10.11604/pamj.2019.32.119.18351

UNESCO Institute for Statistics (UIS). (2020). *Women in Science. Fact Sheet No. 60 June 2020.*https://uis.unesco.org/sites/default/files/documents/fs60-women-in-science-2020-en.pdf

UNESCO. (2022). *Education starts early: progress, challenges and opportunities; conference background report.* World Conference on Early Childhood Care and Education, Tashkent, Uzbekistan, November 2022. https://unesdoc.unesco.org/ark:/48223/pf0000383668?posInSet=17&queryId=dcdf952c-6ea1-4cbb-8263-8f48574060c5

UNESCO Institute for Statistics (UIS). (2024). *Science, technology and innovation.* https://data.uis.unesco.org/Index.aspx?DataSetCode=SCN_DS

UNESCO and UNICEF. (2024). *Global report on early childhood care and education: The right to a strong foundation*. https://unesdoc.unesco.org/ark:/48223/pf0000390215

United Nations. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

UNICEF. (2019). *Population dynamics and the demographic dividend potential of Eastern and Southern Africa: A primer*. Nairobi. United Nations Children's Fund (UNICEF), Eastern and Southern Africa Regional Office (ESARO), Nairobi, Kenya https://www.unicef.org/esa/media/4961/file/UNICEF-ESA-Population-Dynamics-Demographic-Dividend-Potential-Nov-2019.pdf

UNICEF. (2021). *Quantifying Heckman: Are governments in Eastern and Southern Africa maximizing returns on investments in early childhood development?* Nairobi. United Nations Children's Fund (UNICEF), Eastern and Southern Africa Regional Office (ESARO), Nairobi, Kenya https://www.unicef.org/esa/media/8156/file/UNICEF-ESARO-Quantifying-Heckman-Paper-2021-revised.pdf

UNICEF and Countdown to 2030 Women's, Children's and Adolescent's Health. (2023). *Country Profiles for Early Childhood Development*. https://nurturing-care.org/resources/country-profiles

United Nations Department of Economic and Social Affairs Population Division. (2022). *World Population Prospects. 2022 Revision.* https://population.un.org/wpp/DataQuery/

Williams, E.M., Iddrisu, D.H., & Rose, P. (2024). *Literature search protocol: Mapping country-based early childhood development research outputs by researchers located in sub-Saharan Africa.* REAL Centre, University of Cambridge and ESSA. https://www.educ.cam.ac.uk/centres/real/researchprojects/ongoing/mapping-education-sub-saharan-africa/Literature-search-protocol-ECD-research-outputs.pdf

World Bank. (2024). *2024 World Development Indicators* https://data.worldbank.org/indicator/SL.AGR.EMPL.FE.ZS?locations=ZG

World Health Organization, United Nations Children's Fund, & World Bank Group. (2018). *Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential.* Geneva, World Health Organization. https://iris.who.int/bitstream/handle/10665/272603/9789241514064-eng.pdf?sequence=1

World Health Organization, & United Nations Children's Fund (UNICEF). (2023). *Nurturing care framework progress report 2018-2023: reflections and looking forward.* https://iris.who.int/bitstream/handle/10665/369449/9789240074460-eng.pdf?sequence=1

Yoshikawa, H., & Kabay, S. (2015). *The evidence base on early childhood care and education in global contexts. Paper commissioned for the EFA Global Monitoring Report 2015, Education for All 2000-2015: achievements and challenges.* https://unesdoc.unesco.org/ark:/48223/pf0000232456

Zubairi, A., & Rose, P. (2021). *A better start? A progress check on donor funding for pre-primary education and early childhood development*. https://theirworld.org/wp-content/uploads/2021/07/ABetterStart-Report-Pages_210720_160759.pdf

Zubairi, A. & Rose, P. (2024). *A turning point? An updated scorecard on donor funding to pre-primary education.* https://actforearlyyears.org/wp-content/uploads/sites/261/Scorecard-FINAL-2024-07-May.pdf

Endnotes

[i] South Africa was excluded because researchers there may not face the same challenges faced by the rest of the SSA countries, and thus there are many more publications indexed in international databases (see Mitchell & Rose, 2018). In addition, South Africa has the highest ECE attendance rate in the region (48 percent) and also fares better on other ECD indicators, while showing wide inequalities across population groups.

[ii] A related process was done with Mozambique, but only 20 research outputs were found. We have not included it in this report as the process adopted was not identical to the other four countries, as detailed in the mapping protocol developed for this exercise.

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