



## Conference on ‘Nutrition dynamics in Africa: opportunities and challenges for meeting the sustainable development goals’

### Evidence-informed decision making for nutrition: African experiences and way forward

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Although substantial amount of nutrition research is conducted in Africa, the research agenda is mainly donor-driven. There is a clear need for a revised research agenda in Africa which is both driven by and responding to local priorities. The present paper summarises proceedings of a symposium on how evidence can guide decision makers towards context-appropriate priorities and decisions in nutrition. The paper focuses on lessons learnt from case studies by the Evidence Informed Decision Making in Nutrition and Health Network implemented between 2015 and 2016 in Benin, Ghana and South Africa. Activities within these countries were organised around problem-oriented evidence-informed decision-making (EIDM), capacity strengthening and leadership and horizontal collaboration. Using a combination of desk-reviews, stakeholder influence-mapping, semi-structured interviews and convening platforms, these country-level studies demonstrated strong interest for partnership between researchers and decision makers, and use of research evidence for prioritisation and decision making in nutrition. Identified capacity gaps were addressed through training workshops on EIDM, systematic reviews, cost–benefit evaluations and evidence contextualisation. Investing in knowledge partnerships and development of capacity and leadership are key to drive appropriate use of evidence in nutrition policy and programming in Africa.

#### **Evidence: Decision making: Priority-setting: Africa: Nutrition: Policy: Health**

In April 2016, the UN General Assembly declared the next 10 years as a decade of Action on Nutrition around the world<sup>(1)</sup>. In the African context, this declaration is even more pertinent considering the current unacceptably high burden of malnutrition and the relatively slow pace in the decline of malnutrition on the continent. Presently, an estimated 220 million people on the African

continent are energy-deficient<sup>(2)</sup>. In addition, micronutrient malnutrition remains widespread and affects the most vulnerable<sup>(2)</sup>. More than 165 million children and women of reproductive age are anaemic<sup>(3)</sup>; the burden of anaemia is pervasive and excessively prevalent in all but two African countries. Almost 60 million African children under 5 years are stunted<sup>(4)</sup>. Concurrently,

**Abbreviations:** EIDM, evidence-informed decision making; EVIDENT, Evidence Informed Decision Making in Nutrition and Health.

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obesity and overweight are increasing across the continent with more than one quarter of the global burden of overweight/obesity in preschool age children occurring in Africa<sup>(4)</sup>.

In many African countries, the burden of malnutrition is multi-faceted. For example, in thirteen countries, health and nutrition authorities are struggling to deal with a triple challenge of malnutrition: unacceptably high rates of childhood stunting, anaemia and overweight<sup>(5)</sup>. These different forms of malnutrition place huge social and economic costs on society. Some estimates indicate that annual costs of undernutrition range between 3 and 16% of Gross Domestic Product<sup>(6)</sup>. If low- and middle-income countries take no action on non-communicable diseases, cumulative costs are estimated to reach \$7 trillion between 2011 and 2025<sup>(7)</sup>.

The present paper reviews existing published and grey literature and discusses the need for building capacity, academic research networks and promoting evidence-informed decision making (EIDM) to address malnutrition in Africa. The paper expands on a chapter presented in the 2015 Annual trends and Outlook Report<sup>(8)</sup> of ReSAKSS Africa. It also draws upon a symposium entitled 'Evidence-informed decision making for nutrition: African experiences and way forward', which was presented at the 2016 African Nutrition Epidemiology Conference to highlight EIDM. The paper concludes by sharing lessons learnt from existing EIDM initiatives in Africa with the view to diffuse EIDM in policy and programme planning to address malnutrition and disease burden across the continent.

### Research and policy landscape in Africa

A key component in addressing malnutrition is the use of high quality evidence by decision makers<sup>(9)</sup>. Evidence-informed nutrition policies and research programmes, when introduced on a national scale and appropriately prioritised, have the potential to encourage delivery of improved nutrition services, and contribute to sustainable development outcomes<sup>(10,11)</sup>. The enhancement of EIDM and policy-driven nutrition research in resource-limited settings is thus increasingly recognised as essential for maximising public health benefits and resources<sup>(12)</sup>. Implemented appropriately, EIDM is likely to translate quality evidence into action and enhance impact, particularly in the world's poorest settings<sup>(13)</sup>.

A critical and practical aspect of applying EIDM is the conceptualisation of what constitutes evidence (Fig. 1)<sup>(14)</sup>. The Health Evidence Network defines evidence as 'findings from research and other knowledge that may serve as a useful basis for decision making in public health and health care'<sup>(15)</sup>. This definition aptly captures key factors that influence decision making beyond research findings. Such factors include levels of experience, existing public health resources, knowledge about community nutrition and health challenges, community preferences and needs, and the political climate<sup>(16,17)</sup>.

It is known, however, that harnessing the power of research evidence for decision making in nutrition is

limited by multiple factors in Africa and other low resource settings. Firstly, although a relatively large volume of published nutrition research exists in Africa, this research is mainly descriptive with insufficient intervention-related evidence to support policy development<sup>(18)</sup>. Secondly, existing research evidence may not adequately address the priorities of national and local contexts<sup>(19–21)</sup> and particularly, the needs of low- and middle-income countries<sup>(22)</sup>. Even where they exist, insufficient effort is invested in championing use of existing nutrition research by policy makers<sup>(23)</sup>. This lack of visibility of evidence can prevent uptake of the existing research evidence.

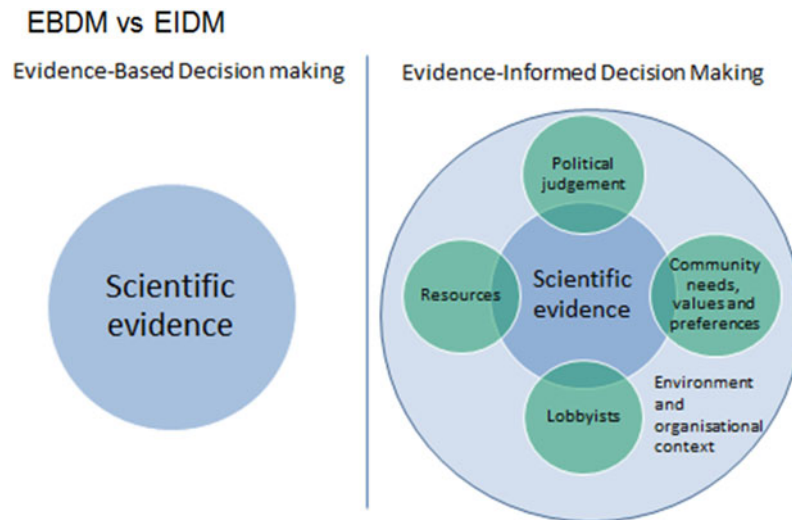
Other systemic challenges to evidence use have been identified. In an analysis of barriers towards sustainable nutrition research, African researchers identified unmet need for developing and conducting research that meets quality demands from high-impact journals. This is partly because of inadequate resources and funding needed to design and implement long-term follow-up or experimental studies with sufficient statistical power. Much of the existing research in Africa is typically supported by *ad hoc* funding and collaborations with non-African researchers and donors. Capacity to take stock of existing literature and research proposals that address pertinent knowledge gaps and policy demands were considered essential to support the local research agenda<sup>(24)</sup>.

Although not limited to Africa, it is also known that many nutrition studies are electronically locked behind journal paywalls and thus remain inaccessible, particularly to decision makers. Also, a significant proportion of local research in Africa is published in Africa-based journals or shared as grey literature, which is not indexed in high visibility databases and therefore difficult to access. Conversely, the existing research outputs remain inaccessible to most decision makers largely because scientists tend to promote their work to academic audiences, effectively leaving out the decision makers who need the evidence for decision making. In some cases, accessible research may be limited by biases linked with poor study design and poor reporting of findings<sup>(25,26)</sup>.

As a result, decisions to address malnutrition may either be unsupported by relevant evidence<sup>(23,24)</sup>, or be based on poor-quality evidence. In situations where there is insufficient time, resources or capacity to generate quality evidence, decision makers are left with no choice but to use anecdotal evidence to support decisions. Such evidence, however, ranks low on the evidence-appraisal scale and is thus likely to result in low-impact interventions and a waste of scarce resources.

### Evidence-informed decision making: response to accelerating progress in reducing malnutrition burden in Africa

Working with a range of diverse actors, new efforts are therefore needed in Africa to foster EIDM to address the malnutrition burden. The availability of high-quality evidence is necessary, but insufficient by itself in decision-making processes. A culture of information stewardship



**Fig. 1.** Conceptualisation of evidence informed v. evidence-based. Adapted from Satterfield *et al*<sup>(14)</sup>.

and long-term commitment needs to be fostered within the nutrition research community. Evidence synthesis tools, such as evidence maps, systematic reviews and rapid reviews, are useful and enable policy makers to make informed decisions on which policies to invest in. These tools further enable academia to harness the available evidence. In addition, capacity in implementing health technology assessments is critical in learning about the properties, effects and/or impacts of health technologies and interventions. Evidence synthesis and technology assessments should, however, be tailored to identify and prioritise needs, by addressing locally relevant questions, to reduce the risk of epidemiological research waste.

Before evidence can be translated into action (such as policy, programmes, or decisions), other factors such as economic constraints, advocacy, community preferences, traditions and values must be considered. Using evidence to inform decisions therefore requires leadership, capacity and concerted action<sup>(22)</sup>. Both technical capacity and leadership are critical<sup>(23)</sup> for harnessing the use of evidence to inform policies and programmes, and therefore better decisions. Such capacity and leadership skills are required at all stages of the stepwise EIDM process: from articulating demand, generating data, conducting evidence synthesis and mobilising knowledge from multi-sectoral research to translating knowledge from research to the local context. This does not only involve strengthening individual capacity but also necessitates building operational and institutional capacity (for example researchers) and increasing the sustainability and resilience of the systematic evidence-informed processes and partners.

The African Nutrition Leadership Programme is a model of how to develop individual functional leadership capacity in Africa<sup>(27)</sup>. In addition, leadership for nutrition within all government agencies (such as agriculture, water and sanitation, and social protection), civil society, the UN, academia, bilateral donors and the private sector is recognised as a fundamental aspect of translating evidence of the effectiveness of multi-sectoral nutrition programmes

and policies into action on the ground. A number of initiatives are presently ongoing that seek to strengthen capacity for enhancing technical competence in nutrition in Africa<sup>(28)</sup> including re-entry grants by the International Union of Nutritional Sciences; the eNutrition Academy platform for eLearning, creating access to high quality evidence through Hinari, and Agora, EnLink Library and North-South research collaboration that includes capacity development components<sup>(28,29)</sup>.

Multiple EIDM initiatives have been identified in Africa (see **Box 1** for a brief overview). Evidence Informed Decision Making in Nutrition and Health (EVIDENT) is a relatively new initiative that has attempted to follow a stepwise EIDM process. The Scaling Up Nutrition movement also uses a similar approach of engaging stakeholders and to using existing evidence-base<sup>(30)</sup>. EIDM initiatives that promote leadership, include Leveraging Agriculture for Nutrition in South Asia and Leveraging Agriculture for Nutrition in East Africa, both of which operate as part of the CGIAR Agriculture for Nutrition and Health Program. All these initiatives demonstrate promising solutions for addressing the identified challenges, and could have huge impact when scaled up.

### The collaboration for Evidence Informed Decision Making in Nutrition and Health

EVIDENT is an international collaboration, which aims to strengthen the capacity to address the disparity between research activities and local evidence needs in nutrition and health in Africa. Hence, EVIDENT aims to bridge the gap between academic research and nutrition policies and programmes. Unlike other initiatives that aim to improve the use of evidence in decision making in health, EVIDENT focuses primarily on nutrition. EVIDENT, therefore, encompasses all issues that are at the forefront of global nutrition and health policy, and highly relevant

**Box 1. Evidence-informed decision-making initiatives in Africa**

Agriculture for Nutrition and Health (A4NH): A Consultative Group on International Agricultural Research Programme focused on linkages between agriculture, nutrition and health. [www.a4nh.cgiar.org/](http://www.a4nh.cgiar.org/)

African Evidence Network: A network of researchers, practitioners, and policymakers promoting evidence production and use in decision making. For education, health and technology. [www.africaevidencenetwork.org/about-us/](http://www.africaevidencenetwork.org/about-us/)

Cochrane Nutrition Field South Africa: Based in South Africa and seeks to increase coverage, quality and relevance of Cochrane nutrition reviews. <http://cwww.cochrane.org/news/cochrane-nutrition-field-established-south-africa>

Building Capacity to Use Research Evidence (BCURE): Promotes and builds capacity in EIDM in developing countries. [bcureglobal.wordpress.com/](http://bcureglobal.wordpress.com/)

Leveraging Agriculture for Nutrition in East Africa (LANEA): An international research consortia on leveraging agriculture and food policies and interventions to nutrition. [www.fao.org/3/a-i4550e.pdf](http://www.fao.org/3/a-i4550e.pdf)

Supporting the Use of Research Evidence (SURE): A collaborative project to strengthen of EIDM capacity and partnerships in Africa. [www.who.int/evidence/sure/en/](http://www.who.int/evidence/sure/en/)

The SECURE Health Programme: An initiative of the African Institute for Development Policy to improve and optimise individual and institutional capacity in accessing and using data and research evidence in decision making for health. [www.afidep.org/?p=1364](http://www.afidep.org/?p=1364)

VakaYiko Consortium: A programme of the International Network for the Availability of Scientific Publications. Aims to build capacity and create an enabling environment for EIDM [www.inasp.info/en/work/vakayiko/](http://www.inasp.info/en/work/vakayiko/)

to Africa, focusing on stunting, infant and young child feeding, maternal and child health, micronutrient deficiencies, obesity and diet-related non-communicable diseases.

The EVIDENT approach is to provide evidence that is tailored to the expressed needs of decision makers. EVIDENT aims to increase impact by strengthening this evidence-policy pathway and also by translating local needs into recommendations that are specific, actionable and informed by the best available evidence, with recognition of stakeholder priorities.

Through activities within each pillar, EVIDENT investigates if such a stepwise process for identifying and using evidence actually leads to better decision making and better nutrition policies in countries with a high burden of malnutrition in all its forms. EVIDENT also explores how best to conceptually represent these processes of evidence application across different countries: i.e. whether this *a priori* framework applies in a linear way as proposed in Fig. 2, or whether it is a more iterative process.

#### Activities in African countries

In the past 3 years, EVIDENT has implemented numerous activities in four case countries in Africa, of which three are described here: Benin, Ghana and South Africa (Fig. 3). Although the case study activities have been designed to address needs relevant to each country's context, common strands emerge across countries. These include the process for engaging with key stakeholders in nutrition to understand the present process for decision making, the key players who influence nutrition programming and the process for prioritisation of nutrition actions. These case studies were designed to be conducted alongside a rapid stakeholder mapping exercise. Overall, the learning activities were carried out in consultation with the relevant nutrition departments or agencies of the case study countries. In addition to the case studies, key personnel in academia and programme implementing Government Departments have been trained on aspects of EIDM, including evidence synthesis, cost-effectiveness and contextualisation of evidence.

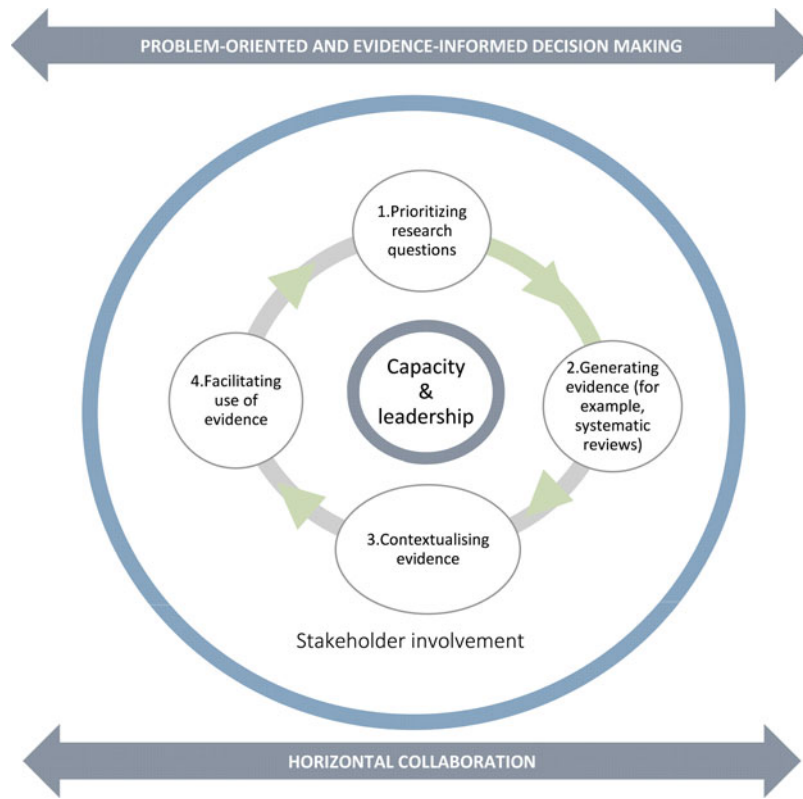
In all three countries, the case studies focused on identifying who the key stakeholders were in nutrition policy

and programme implementation. Similar tools were utilised in the process of stakeholder influence mapping: Net-Mapping in Ghana<sup>(31)</sup>, Mind Mapping in Benin and Power to Influence Matrix in South Africa<sup>(32)</sup>. In all countries, it was clear that a wide variety of partners were involved in nutrition policy and programming in addition to Government agencies. These included UN agencies, civil society actors (both international and indigenous), research and academia, and the media. Nevertheless, the roles and influence of various stakeholders are not always the same across countries.

Also in all countries, key informant interviews were undertaken with high level officials of multi-stakeholder organisations (exception: only government sector in South Africa) were utilised. In addition, a desk review in Ghana was used to explore the process for nutrition policy and programme prioritisation and decision-making processes as well as the process for EIDM in nutrition. Furthermore, priority questions for nutrition were identified within countries for which three relevant systematic reviews are currently underway (PROSPERO registrations: Benin: CRD42016035941; Ghana: CRD4201037471; South-Africa: CRD42016038451). All countries have conducted a dissemination process in which stakeholders were engaged to discuss findings of the case study. From these case studies, it emerged that policies are driven by evidence generated both within and outside a country (e.g. UN Agencies, bilateral donor agencies). However, application of evidence was moderated by multiple factors including political will, influential international agencies, personal interests of decision makers, availability of local evidence and funding. It also became clear that the defined *a priori* framework differed across countries, and may not apply in a linear way as has been proposed in Fig. 2.

#### Lessons learnt in the Evidence Informed Decision Making in Nutrition and Health network across countries

Experiences from the case studies have shown that using evidence to inform decision making is neither cheap nor

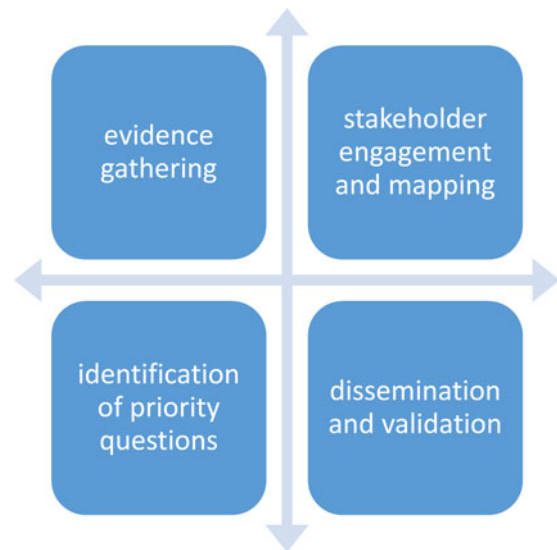


**Fig. 2.** Evidence informed decision making in nutrition and health (EVIDENT) conceptual framework for evidence-informed decision making. Source: The EVIDENT Partnership (<http://www.evident-network.org/>) and Holdsworth *et al*<sup>(8)</sup>.

easy, but it has major advantages. The ten key lessons learnt from this process are summarised in Table 1 later:

Altogether, experiences from the EVIDENT activities demonstrate some key aspects of what is required to fill the gap for EIDM in Africa. Going into the future, EIDM initiatives need to cultivate leadership and capacity within and across countries. In the example of EVIDENT, this leadership emerged from academia. In practice, it has become clear that there is still more work to be done to bring academics into a common space with decision makers and implementers. When appropriately cultivated, this leadership will be useful to generate and sustain needed partnerships and harness available resources for generating, appraising, contextualising and championing evidence for decision-making and prioritisation in nutrition.

On various platforms where the experiences of EVIDENT have been shared, there has been a positive response to the achievements made. In addition, EVIDENT has been urged to share the experiences and lessons learnt more widely in order to engender interest and uptake in other settings. A key challenge however remains how to sustain the momentum generated. One of the proposed means is to partner with established initiatives like the Scaling Up Nutrition movement and the Agriculture, Nutrition & Health academy. This way, more stakeholders and also with a varied



**Fig. 3.** (Colour online) Case study activities in Benin, Ghana and South Africa.

background can be reached to sustain activities. In addition, mainstreaming of the EIDM approaches through pre-service training can build capacity as part of higher education training.

**Table 1.** Lessons learnt while implementing evidence-informed decision making (EIDM) case studies in Benin, Ghana and South Africa<sup>(8)</sup>

Lessons learnt	Evidence for similarities and differences across countries
1 Relationship building	In all three countries, relationship building was both recognised and utilised as an important tool. In the case of Ghana and Benin, the success of the case studies was hinged on prior existing relationships cultivated through joint training programmes and research activities, which created basis for engagement and thereby facilitated the process of data collection, stakeholder mapping and consensus building. In the case of South Africa, relationship building was an outcome of the case study. The presentation of the case study findings to multiple stakeholders engendered recognition for increased collaboration across sectors. Across countries, creation of South-South collaborations are important for experience sharing and sustenance of EIDM competencies learned
2 Clear and concise communication	In all three countries, there was clear desire for increased sharing of knowledge and information across sectors. Nutrition programme implementers and decision makers in Ghana and Benin were particularly clear about their need for research evidence to inform decisions as well as their desire to be informed about progress of ongoing local research. However, there was no existing mechanism for sharing information across sectors
3 Leadership by African partners	Partners in EVIDENT have different levels of capacities associated with leadership potential. Over the course of the 3-year programme, South Africa and Ghana, demonstrated strong interest and willingness, and gained confidence to co-lead the programme. They have thus emerged as co-leaders to coordinate EVIDENT actions across the continent and beyond. Transition to African leadership has been a key output of the 3-year programme to sustain the momentum of EVIDENT
4 EIDM processes are context-specific	Capacity generation and the uptake of evidence-informed products are highly context-driven. Compared with the other partners, South Africa already has an existing local system through which decision-makers request evidence products generated through an evidence appraisal mechanism. In Ghana and Benin, decision makers are heavily reliant on globally-generated (often UN) strategies which are then contextualised with support of external or internal evidence brokers (consultants). These contextual differences indicate that what works in one setting to enhance EIDM may not necessarily work well in another; a one-size fit all approach may not be ideal for every context. The EIDM processes are also not as linear or straightforward as was hypothesised (see Fig. 2)
5 High demand for cross-talk between research and decision making sectors	There is clear interest to increase and enhance collaboration between local researchers/ research institutions and decision makers in all three case study countries. In the case of Ghana, decision makers expressed desire for more opportunities to utilise local evidence. However, there is need to build leadership and capacity to foster and nurture this cross-talk
6 Experience in the implementation of case studies varies across countries	Despite the similarities in purpose of the case studies across countries (i.e. identifying priorities and decision making processes in nutrition), there were significant differences in implementation. In Ghana, a combination of desk reviews, in-depth interviews and stakeholder meetings were used. In South Africa and Benin, in-depth interviews were the main approach utilised. The challenges to implementation were however, unique across countries. For example, in South Africa, there were challenges in setting up meetings with stakeholders due to long-standing mistrust between decision makers and scientists. In the Ghanaian context, the difficulty was having opportunity to engage with implementing stakeholders who were so occupied and difficult to meet to have discussions on EIDM. What was common in all case study countries, however, was that engaging with stakeholders took time and trust, and therefore cannot be rushed
7 Nutrition researchers experienced a paradigm shift concerning knowledge translation and networks	Feedback from training activities demonstrates a greater appreciation of the big picture regarding knowledge translation beyond primary research. On the part of researchers, there is awareness of the processes for championing, appraising and packaging knowledge for use by decision makers. On the part of decision makers, there is greater awareness and interest to demand evidence products and to work collaboratively with the research sector. There is however recognition that decision makers have to be actively courted to embrace EIDM since it may be a paradigm shift in the way they function
8 Impact pathways are needed to clarify needs and enhance impact in the EIDM cycle	Contextual differences across case study countries revealed the need to be guided by a clearly defined impact pathway. Such pathways need to be empirically tested for efficacy and could potentially be adapted for use in other settings
9 Co-creation of priority questions and solutions are key for EIDM	Across all three countries there is recognition by both researchers and decision makers of the need to work together in identifying research questions, appraising the evidence and applying the outcomes to decision making
10 Collaboration between EVIDENT and SUN and other Global/Regional initiatives can strengthen the potential impact of EVIDENT	Ghana and Benin are both signed up to the SUN Movement. In both countries, EVIDENT identified the harnessed opportunities to engage with the existing multi-stakeholder platform of SUN in the case study. This was found to be useful for implementation of the case study. South Africa is not a SUN country and the case study was focused on Government officials only. Nevertheless there was a platform in South Africa to engage with

EVIDENT, Evidence informed decision making in nutrition and health

### Methodological advances

Access to information is a key enabler of informed decision making. Although progress has been made in facilitating access to academic publications in low- and middle-income countries, practical constraints such as poor internet connectivity and language barriers persist. Although international consensus favours the need to make published research evidence and data accessible, much data intended for sharing remains isolated, and stored in formats that restrict reuse<sup>(33)</sup>. One initiative, which indirectly resulted from EVIDENT, to improve usefulness of nutrition research, is the development of reporting guidelines for nutrition research known as STROBE-nut<sup>(34)</sup>. STROBE-nut provides a set of twenty-four items to consider when reporting research regarding nutritional epidemiology and dietary assessment, with the aim to increase completeness and interpretation of nutrition research and thereby to strengthen the quality of the evidence base.

### Conclusion

The emergence of EIDM initiatives on the African continent is an indication of the growing demand by decision makers at different levels for high quality evidence to inform decision making. The case studies in three different African countries presented here revealed strong interest for partnership between researchers and decision makers. However, there is need to cultivate, nurture and strengthen the linkages to accelerate progress in reducing the malnutrition burden in Africa. The existence of networks like EVIDENT and other similar EIDM initiatives can support the development of both capacity and leadership, EIDM processes and the necessary partnerships. The growth of EIDM, however, needs to be championed actively by both researchers and decision makers and supported at regional, national and international level.

### Acknowledgement

The EVIDENT Network appreciates the time and effort of all stakeholders at global and national levels to participate in the stakeholder consultations.

### Financial Support

This research received a grant from the Development Cooperation of Belgium (#912502) ([http://diplomatie.belgium.be/en/policy/development\\_cooperation/](http://diplomatie.belgium.be/en/policy/development_cooperation/)) and Nutrition Third World ([www.nutrition-ntw.org](http://www.nutrition-ntw.org)).

### Conflict of Interest

None.

### Authorship

R. A. drafted the first version of the manuscript. All co-authors reviewed and revised the manuscript.

### References

1. Food and Agriculture Organization (FAO), World Health Organization (WHO) (2016) *United Nations Decade of Action on Nutrition: 2016–2015*. Geneva: United Nations.
2. Covic N & Hendricks SL (editors) (2016) *Achieving a Nutrition Revolution for Africa: The Road to Healthier Diets and Optimal Nutrition*. Ethiopia: The International Food Policy Research Institute.
3. World Health Organization (2015) *The Global Prevalence of Anaemia in 2011*. Geneva: World Health Organization.
4. United Nations Childrens Fund, World Health Organization, World Bank Group (2016) *Levels And Trends In Child Malnutrition: Key findings of the 2016 Edition*. New York: UNICEF/WHO/WB.
5. Haddad L, Bendech MA, Bhatia K *et al.* (2016) Africa's progress toward meeting current nutrition targets. In *Achieving a Nutrition Revolution for Africa: The Road to Healthier Diets and Optimal Nutrition*, pp. 12–27 [N Covic and SL Hendricks, editors]. Ethiopia: International Food Policy Research Institute.
6. Hoddinott J (2016) *The Economics for Reducing Malnutrition in Sub-Saharan Africa*. Global Panel on Agriculture and Food Systems for Nutrition. Available at [http://www.glopan.org/sites/default/files/Global\\_Panel\\_Working\\_Paper.pdf](http://www.glopan.org/sites/default/files/Global_Panel_Working_Paper.pdf)
7. World Health Organization (2014) *Global Status Report on Noncommunicable Diseases 2014*. Geneva: World Health Organization.
8. Holdsworth M, Aryeetey RNO, Jerling J *et al.* (2016) The challenges, opportunities, and lessons learned in evidence-informed decision making in Africa. In *Achieving a Nutrition Revolution for Africa: The Road to Healthier Diets and Optimal Nutrition*, pp. 115–129 [N Covic and SL Hendricks, editors]. Addis Ababa: International Food Policy Research Institute.
9. Lokosang L, Osei A & Covic N (2016) The African union policy environment toward enabling action for nutrition in Africa. In *Achieving A Nutrition Revolution For Africa: The Road To Healthier Diets And Optimal Nutrition. Annual Trends and Outlook Report*, pp. 5–11 [N Covic and SL Hendricks, editors]. Addis Ababa: International Food Policy Research Institute.
10. Gillespie S, Haddad L, Mannar V *et al.* (2013) The politics of reducing malnutrition: building commitment and accelerating progress. *Lancet (London, England)* **382**, 552–569.
11. Bryce J, Coitinho D, Darnton-Hill I *et al.* (2008) Maternal and child undernutrition: effective action at national level. *Lancet (London, England)* **371**, 510–526.
12. Ioannidis JP, Greenland S, Hlatky MA *et al.* (2014) Increasing value and reducing waste in research design, conduct, and analysis. *Lancet (London, England)* **383**, 166–175.
13. Council on Health Research for Development (2007) *Are International Health Research Programmes Doing Enough to Develop Research Systems and Skills in Low and Middle Income Countries?* Available at <http://health-equity.lib.umd.edu/891/>.
14. Satterfield JM, Spring B, Brownson RC *et al.* (2009) Toward a transdisciplinary model of evidence-based practice. *Milbank Quarterly* **87**, 368–390.



15. Lomas J, Culyer T, McCutcheon C *et al.* (2005) *Conceptualizing and Combining Evidence for Health System Guidance*. Ontario: Canadian Health Services Research Foundation.
16. Yost J, Dobbins M, Traynor R *et al.* (2014) Tools to support evidence-informed public health decision making. *BMC Public Health* **14**, 1–13.
17. National Collaborating Centre for Methods and Tools (2016). *Evidence-Informed Public Health: What is Evidence-Informed Public Health?* Available at <http://www.nccmt.ca/professional-development/eiph>.
18. Lachat C, Roberfroid D, Van den Broeck L *et al.* (2015) A decade of nutrition research in Africa: assessment of the evidence base and academic collaboration. *Public Health Nutrition* **18**, 1890–1897.
19. Morris SS, Cogill B & Uauy R (2008) Effective international action against undernutrition: why has it proven so difficult and what can be done to accelerate progress? *Lancet (London, England)* **371**, 608–621.
20. Holdsworth M, Kruger A, Nago E *et al.* (2015) African stakeholders' views of research options to improve nutritional status in sub-Saharan Africa. *Health Policy and Planning* **30**, 863–874.
21. Verstraeten R, Roberfroid D, Lachat C *et al.* (2012) Effectiveness of preventive school-based obesity interventions in low- and middle-income countries: a systematic review. *American Journal of Clinical Nutrition* **96**, 415–438.
22. Resnick D, Babu S, Haggblade S *et al.* (2015) *Conceptualizing Drivers of Policy Change in Agriculture, Nutrition, and Food Security: The Kaleidoscope Model*. International Food Policy Research Institute. Available at [http://fsg.afre.msu.edu/fsp/Resnick\\_DP.pdf](http://fsg.afre.msu.edu/fsp/Resnick_DP.pdf)
23. Gillespie S, Hodge J, Yosef S *et al.* (editors) (2016) *Nourishing Millions: Stories of Change in Nutrition*. Washington, DC: International Food Policy Research Institute.
24. Lachat C, Roberfroid D, van den Broeck L *et al.* (2014) Developing a sustainable nutrition research agenda in Africa in the years to come – findings from the SUNRAY project. *PLoS Medicine* **11**, e1001593.
25. King DA (2004) The scientific impact of nations. *Nature* **430**, 311–316.
26. Horton R (2000) North and South: bridging the information gap. *Lancet* **355**, 2231–2236.
27. Taljaard C (2012) Nutrition leadership in Africa: making the change. *South African Journal of Clinical Nutrition* **25**, 154.
28. Aryeetey R & Lartey A (2016) *A Creation of Local Capacity*. In *50th Anniversary Report 2015*, Nestle Nutrition Foundation. Available at <http://www.nestlefoundation.org/docs/AnnualReport2015.pdf>
29. Geissler C, Amuna P, Kattelman KK *et al.* (2016) The eNutrition Academy: supporting a new generation of nutritional scientists around the world. *Advances in Nutrition (Bethesda, Md)* **7**, 190–198.
30. Scaling Up Nutrition Movement Secretariat (2016). *Scaling Up Nutrition: 'SUN Countries'*. Available at [www.scalingupnutrition.org/sun-countries](http://www.scalingupnutrition.org/sun-countries).
31. Schiffer E & Waale D (2008) *Tracing Power and Influence in Networks: Net-Map as a Tool for Research and Strategic Network Planning*. Washington, DC: IFPRI.
32. Community Tool Box (2016) *Tools to Change our World*. Kansas: University of Kansas. Available at <http://ctb.ku.edu/en/table-of-contents/participation/encouraging-involvement/identify-stakeholders/main> (accessed November 2016).
33. Wilkinson MD, Dumontier M, Aalbersberg IJ *et al.* (2016) The FAIR guiding principles for scientific data management and stewardship. *Scientific Data* **3**, 160018.
34. Lachat C, Hawwash D, Ocke MC *et al.* (2016) Strengthening the reporting of observational studies in epidemiology-nutritional epidemiology (STROBE-nut): an extension of the STROBE statement. *PLoS Medicine* **13**, e1002036.