



Global Data Visualization Tools to Empower Decision-Making in Nutrition

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Key messages

- > Well-designed data visualization tools (DVTs) can solve certain data challenges facing nutrition stakeholders. DVTs help people understand the meaning of data by placing the most relevant data in easy-to-interpret visualization formats such as bar graphs or maps, and can facilitate data-driven decision-making.
- > The number of DVTs in existence is growing, which may be useful if individual DVTs serve different and complementary purposes. However, there are inefficiencies in the landscape. The global nutrition community of DVT producers and funders could: support coordination to increase synergies and share learnings; convene DVT producers that report on common indicators to reduce divergent messages; and strengthen capacity to interpret and use data for decision-making.
- > Three key insights for those developing DVTs are likely to increase the effectiveness of DVTs: having a clear theory of change about the key decisions (and respective users) that the DVT aims to support and what actions are needed to deliver that change; including more actionable indicators; and ensuring the DVTs' formats align with users' data literacy levels and needs.

This analysis was conducted by Results for Development Institute (R4D) as part of the Data for Decisions to Expand Nutrition Transformation (DataDENT) initiative, which aims to transform the availability and use of nutrition data by addressing gaps in nutrition measurement and advocating for stronger nutrition

data systems. For DataDENT, R4D conducted a landscaping of 22 global data visualization tools in nutrition, as well as a literature review of data visualizations to complement the landscaping. These activities aim to improve the uptake of data for decision-making in nutrition.

Nutrition data users face many challenges

Thanks to the significant investments in the nutrition data landscape over the past decade, more data is available to support the work of nutrition policymakers, implementers, donors, advocates and researchers. Data is collected through routine administrative health information platforms (e.g., District Health Information System 2 [DHIS2]), large-scale household surveys (e.g., Demographic and Health Surveys [DHS], Multiple Indicator Cluster Surveys [MICS] and Standardized Monitoring and Assessment of Relief and Transitions [SMART] surveys) and project evaluation studies or monitoring platforms (e.g., Scaling Up Nutrition Monitoring, Evaluation, Accountability and Learning [SUN MEAL] and Hunger and Nutrition Commitment Index [HANCI]). Hundreds of indicators on nutrition outcomes, intervention coverage, underlying determinants and the enabling environment are collected across global data platforms.

While the increased amount of data available represents real progress, challenges still remain. Through the DataDENT engagement with nutrition stakeholders, we have identified that they are confronted with many challenges including:

- > accessing data at the right geographical level (e.g., subnational level) or trend data to track progress across indicators;
- > having clarity on which indicators (and corresponding definitions) are most critical for the decisions they need to make; and
- > analyzing and interpreting data to inform decision-making.

FIGURE 1: Four typologies of data visualization tools: dashboards, scorecards, indices and profiles

Dashboards

Present the most critical performance indicators for a particular goal on a single screen – often used for operations or management purposes

Example: UNICEF/WHO Global Breastfeeding Interactive Dashboard



Scorecards

Compare performance across indicators to display status and monitor progress – often used for advocacy and accountability purposes

Example: African Leaders Malaria Alliance



Indices

Calculate several indicators into a single indicator (or composite score) to rank geographies or other units – often used for advocacy and accountability purposes

Example: Access to Nutrition Index



Profiles

Provide a snapshot of how a geographic region is doing in a particular sector – often used to spread awareness across broad audiences

Example: Global Nutrition Report Country Profiles

Well-designed data visualization tools (DVTs) can help address some of these challenges.

Data visualization tools: a critical tool to help decision-making in nutrition

Our brains have limited capacity to prioritize and process large quantities of data in raw form.¹ Not only do we process visuals more rapidly than text, but data is often more persuasive when presented in graphs rather than in tables.²

“Data visualizations help people understand the meaning of data by placing them in a visual context”

Data visualizations such as bar graphs and scatter plots help people understand the meaning of data by placing them in a visual context. DVTs – scorecards, dashboards, indices and profiles – are interfaces between data and data users that are meant to facilitate decision-making by providing the most critical data for decision-making in a format that is easy to interpret (Figure 1).

A common DVT example in everyday life is the car dashboard (Figure 2). While there is a lot of information about how a car works, the car dashboard curates the most important actionable indicators that drivers need to facilitate decision-making (e.g., the speedometer tells the driver how fast they are going to help monitor speed).

The landscape of global data visualization tools in nutrition

DataDENT reviewed 22 active global DVTs (defined as DVTs that are publicly accessible and cover multiple countries) in nutrition to understand how these contribute to the nutrition landscape. We developed a framework to review DVTs against four parameters:

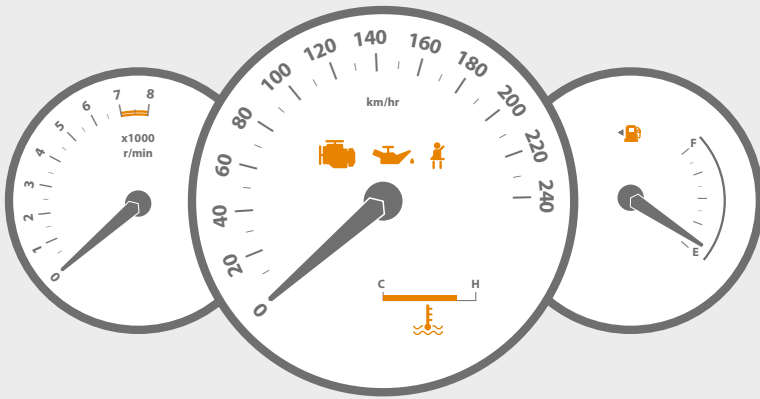
- > goals and audience (i.e., accountability, and planning, implementation and monitoring tools);
- > domains and indicators (e.g., intervention coverage, nutritional status);
- > output structure (i.e., chart types used to visualize data); and
- > dissemination (i.e., timing and method of dissemination).

Based on the DVT review, we conducted consultations with select DVT producers to develop case studies (Figure 3).

We characterized global DVTs into two categories:

- > **Accountability DVTs** – e.g., the Joint Child Malnutrition Estimates interactive dashboard – aim to hold governments accountable for delivering on political commitments or outcomes. These DVTs usually focus on outcome indicators.
- > **Planning, implementation and monitoring (PIM) DVTs** – e.g., the Vitamin A Supplementation Dashboard – provide

FIGURE 2: An everyday example: car dashboard versus statistics in a table

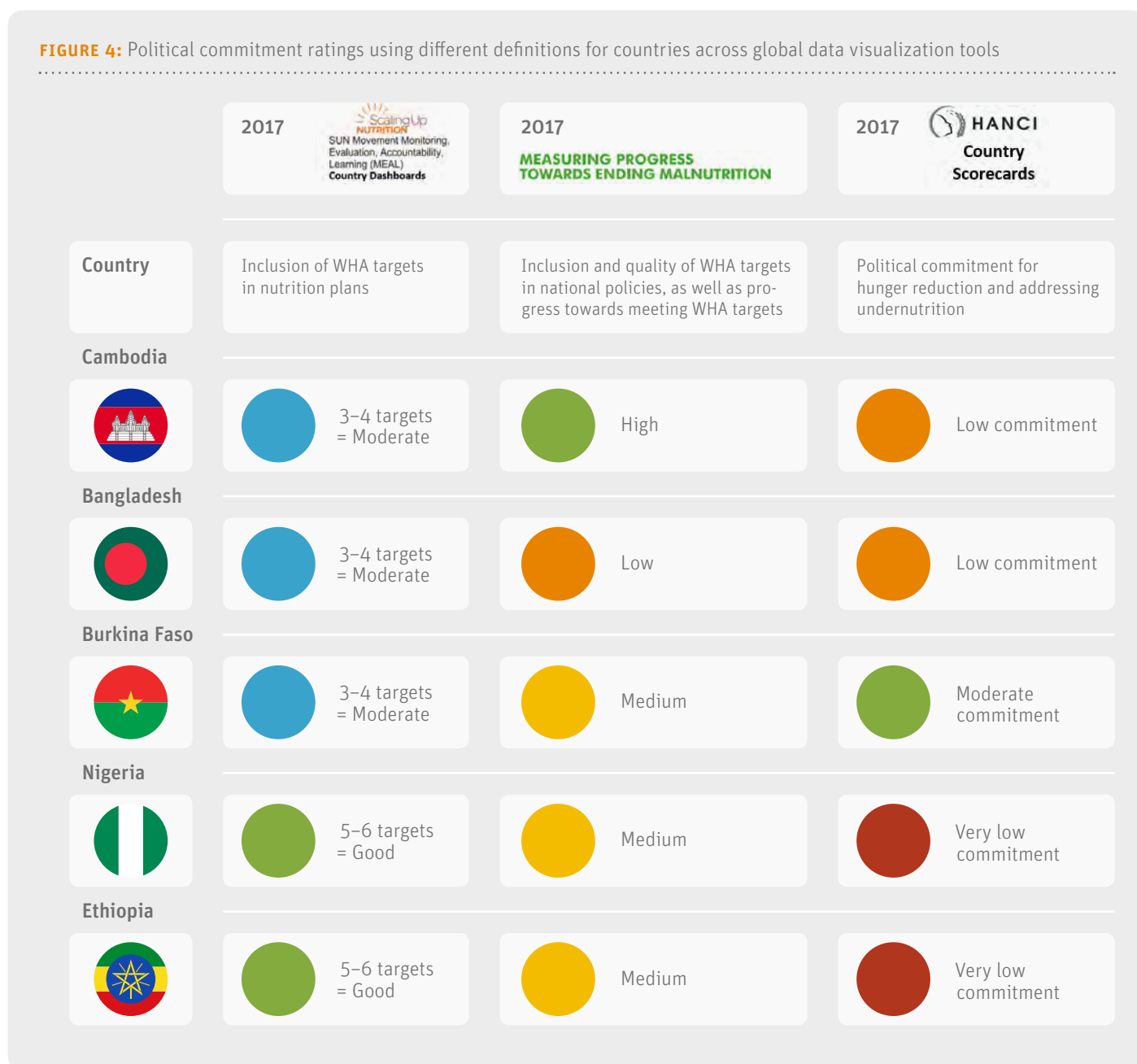


Feature	Status
Rotations per minute	0–8,000
Speed	0–240 km/hour
Engine	Operating, malfunction
Oil	Operating, maintenance needed
Seat belt	Fastened, unfastened
Engine temperature	Cold, hot
Gas	Full, empty

FIGURE 3: Global data visualization tools in nutrition reviewed for landscaping

The figure displays a collection of 20 global data visualization tools in nutrition, arranged in a grid. The tools include:

- HANCI Country Scorecards
- The State of Acute Malnutrition
- Nutrition for Growth Accountability Tool
- Country Indicators
- GLOBAL HUNGER INDEX
- Scaling Up NUTRITION SUN Movement Monitoring Evaluation, Accountability, Learning (MEAL) Country Dashboards
- Investing in Nutrition
- Global Scorecard of Iodine Nutrition
- Global targets tracking tool
- NLIS Nutrition Landscape Information System Country Profiles
- Countdown Country Dashboards
- THE WORLD BANK Nutrition Country Profiles
- GLOBAL FOOD SECURITY INDEX 2017
- ACCESS TO NUTRITION INDEX™
- Global Fortification DATA EXCHANGE
- National Anemia Profile
- MEASURING PROGRESS TOWARDS ENDING MALNUTRITION
- GLOBAL NUTRITION COUNTRY PROFILE
- GLOBAL BREASTFEEDING SCORECARD
- State of the World's Children Report Dashboard
- UNICEF / WHO / World Bank Group Joint Child Malnutrition Estimates Interactive Dashboard
- Vitamin A supplementation interactive dashboard

FIGURE 4: Political commitment ratings using different definitions for countries across global data visualization tools

data to support a range of stakeholders in planning, implementation and monitoring progress. These DVTs tend to include more actionable indicators.

These two categories are not mutually exclusive, and many global DVTs fall into both categories (e.g., the SUN MEAL country dashboards).

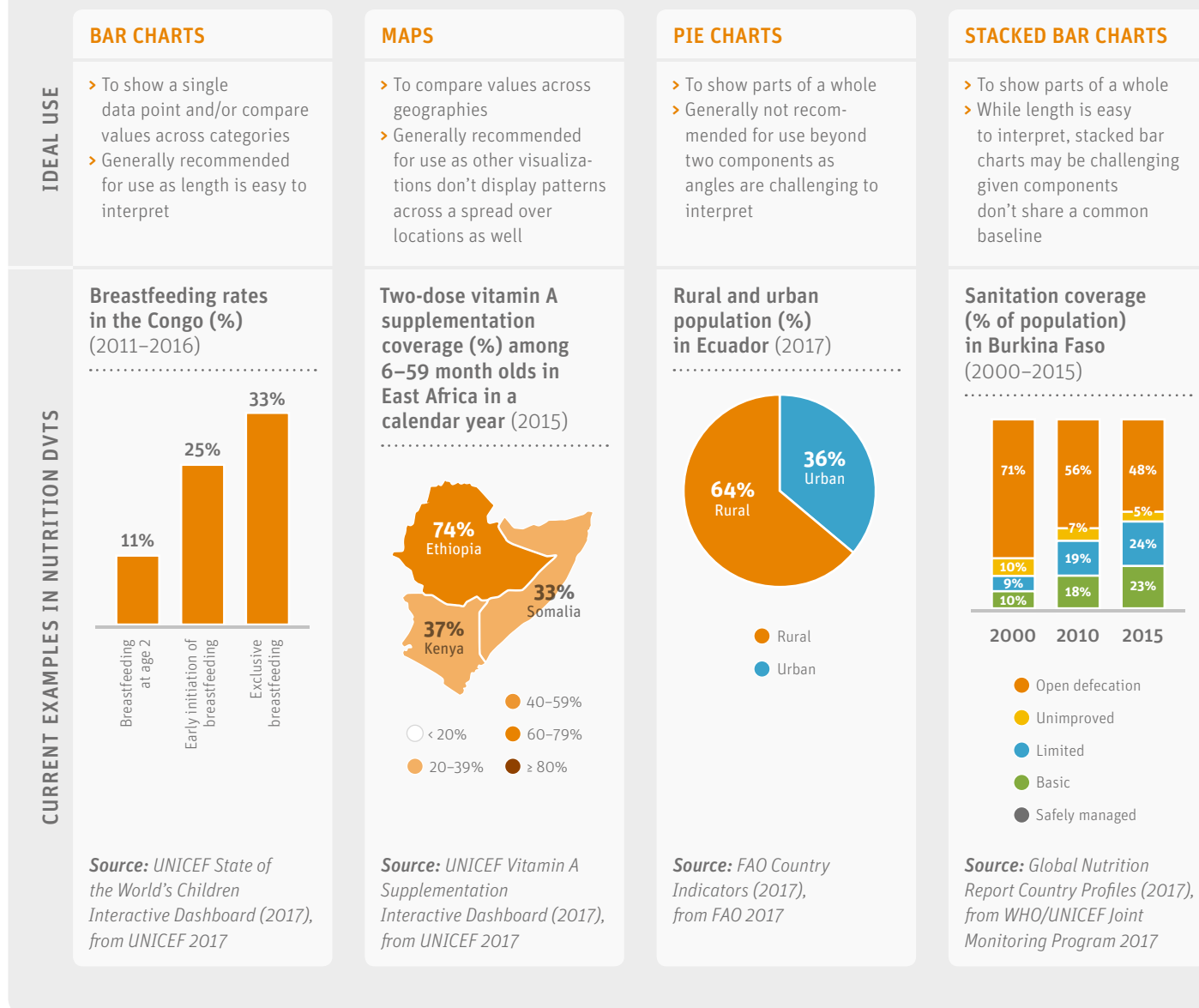
Navigating the growing global data visualization tools landscape

The number of global DVTs in nutrition is increasing. From July 2017 to June 2018, at least 14 global nutrition DVTs were either launched or else refreshed. This growing number may be useful if these DVTs serve different and complementary purposes.

But the proliferation may result in fatigue and confusion if there is overlap. Our analysis reveals inefficiencies in the landscape, mainly due to two challenges.

First, many DVTs report the same or similar nutrition indicators with varying definitions (which may be due to a lack of global standard definitions) and years. This can be challenging for funders, country decision-makers or advocates: How can they assess needs and program progress with such different indicators? For example, iron folic acid (IFA) supplementation during pregnancy is a commonly reported indicator across DVTs. Across five DVTs released between 2015 and 2018 reporting data from the 2010 DHS Burkina Faso, four different definitions (any IFA, < 60 days, 60–89 days and 90+ days during pregnancy) were used, resulting in four different statistics ranging from 23 per-

FIGURE 5: Ideal use of data visualizations and current examples in nutrition data visualization tools



cent to 93 percent. However, in this case, there is currently no global standard definition for this indicator, which impacts the range of definitions reported.

Second, DVTs use different methodologies and definitions to report similar topics. For example, DVTs commonly use traffic-light color coding based on different definitions. The SUN MEAL, Measuring Progress Towards Ending Malnutrition Scorecard and HANCI include metrics on political commitment for countries but use different definitions. SUN MEAL measures the *existence* of World Health Assembly (WHA) targets in nutrition plans; Measuring Progress Towards Ending Malnutrition Scorecard tracks the *existence and quality* of nutrition targets in national policies, as well as progress towards meeting WHA targets; and HANCI measures *political commitment* to hunger reduction and addresses undernutrition. This results in different

ratings, and when viewed together for the same country, likely sends conflicting messages to decision-makers (Figure 4).

Tools in action: three key insights from nutrition data visualization tools

1. Very few DVTs have clear and focused theories of change about the decision(s) they are trying to influence

Making data publicly available to development partners and policymakers with the expectation that it will be used – sometimes known as the ‘build-it-and-they-will-come’ approach – is common. DVTs in nutrition track many domains, including nutrition policies, financing for nutrition, healthy diets, interventions and progress towards global goals, with little clarity about the DVT’s goals and the pathway for change that the DVT is trying

DOT PLOTS

- > To show distribution of data points on a scale
- > Generally recommended for use as dots on a line are easy to interpret

TABLES

- > To show data points in an organized structure
- > While commonly used, it is not the most engaging visualization method

Attendance of 4+ ANC visits and skilled birth attendant by wealth quintile in Cambodia (2014)

Attendance of 4+ ANC visits

61% — 28 — 89%

Skilled birth attendant

75% — 23 — 98%

Rich / poor gap (% points)

20% poorest — 20% richest

Source: Countdown to 2030 Country Dashboards (2017), from DHS 2014

Anemia prevalence in Afghanistan

Indicator	Year	Value	Source info
Anemia in children < 5 years (Hb < 110 g/L) (%)	2011	44.0%	WHO
Anemia in Nonpregnant women (Hb < 120 g/L) (%)	2016	42.4%	WHO GHO
Anemia in pregnant women (Hb < 110 g/L) (%)	2016	38.2%	WHO GHO

Source: WHO Nutrition Landscape Information System (2017), from WHO 2011

to achieve among its targeted audience (which we define as the DVT’s ‘theory of change’).

Without clarity on goals and theory of change, can DVTs prioritize the information they provide and support actions appropriately? Is it possible to assess whether these DVTs are effective?

DVTs with a focused theory of change seem more poised to achieve their goals based on our initial consultations. For instance, the African Leaders Malaria Alliance (ALMA) scorecard is often lauded as a successful DVT for three key reasons. First, it focuses on malaria and targets a select group of decision-makers (i.e., African Heads of States). Second, ALMA measures a select number of the most critical actionable indicators that align with its objectives. Its actionable indicators are flagged with color coding and upward/downward arrows and recommendations

are provided to facilitate action. Finally, it has a strong engagement strategy: Heads of States are provided with quarterly progress reports; ALMA regularly adapts its approach based on user feedback; and, when requested, ALMA facilitates connections to provide technical assistance.

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2. DVTs could include more actionable indicators to support decision-making

Outcome indicators such as stunting and wasting present the ‘state of nutrition’, but are insufficient to support decision-making needs. Indicators such as coverage of stunting prevention interventions (e.g., IFA supplementation during pregnancy or complementary feeding counseling) provide the necessary information to take action and improve stunting outcomes.

We define actionable indicators as providing data that can be acted upon to improve performance and management at the program and systems levels. Actionable indicators typically include policy/enabling environment and intervention coverage indicators.

While most DVTs report some actionable indicators, more actionable indicators could be included to support decision-making as per the DVT’s theory of change. There are three ways to achieve this:

- > if relevant, use actionable indicators that are already collected (and sometimes reported in other DVTs), e.g., *attendance of antenatal care visits (at least four visits)*;
- > if needed, collect new actionable indicators, e.g., *annual meeting frequency of multisectoral coordination bodies or existence of a multisectoral nutrition-costed plan*; and
- > for unavailable data, report blank data to trigger discussions on the need for data collection.

3. There are different ways of visualizing data; the choice should be based on the DVT’s goals, as well as users’ decision needs and data literacy levels

Across nutrition DVTs, several types of visualization are used, including: bar charts, maps, stacked bar charts, pie charts and dot plots – all of which serve different purposes in responding to users’ needs (Figure 5).²⁻⁴

It is critical that visualizations align with the DVT's goals as well as users' data literacy levels and decision needs. A study was conducted on reproductive, maternal, newborn and child health, and nutrition decision-makers (defined as program implementers and policymakers) in Tanzania. These decision-makers generally preferred simple visualizations such as bar graphs and pie charts.⁵ The study also noted statistical capacity was limited and recommended statistical training to improve data interpretation of advanced data analyses and visualizations. In contrast, nutrition stakeholders with high data literacy and advanced statistics backgrounds may have an easier time leveraging complex DVTs, such as the Global Burden of Disease (GBD) Compare tool, which allows users to change the inputs of risk factors and disease causes against different outcomes (e.g., disability-adjusted life years).

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“The growing number of global DVTs in nutrition is a positive reflection of the greater emphasis on data for decision-making, but also a challenge”

Call to action

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The growing number of global DVTs in nutrition is a positive reflection of the greater emphasis on data for decision-making, but also a challenge, given the inefficiencies in the DVT landscape.

DVTs can facilitate decision-making among nutrition stakeholders and be powerful instruments for change. However, to increase effectiveness, our initial findings recommend that DVTs should:

- > **have a clear theory of change**, articulating which decisions (by which users) the DVT aims to support and what supporting actions are needed to deliver change;
 - > **include actionable indicators** that align with the DVT's theory of change, including indicators with little to no data for advocacy purposes; and
 - > **test data visualization formats with targeted users** to ensure formats align with users' data literacy levels and decision needs.
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More broadly, there are three potential opportunities for the global community of DVT producers and funders to improve the efficiency of the landscape:

- > **Support coordination** among the global DVT community to increase synergies, reduce inefficiencies, and share learnings across DVTs.
- > **Convene DVT producers that report on common indicators** to reduce differences in definitions and divergent messages.
- > **Strengthen capacity** of targeted users to interpret and use data for decision-making.

Finally, complementing this review, we will be conducting user research among nutrition stakeholders to identify their data needs and how global DVTs respond to them. We will also conduct a DVT landscaping exercise with user research in India to understand how DVTs support country decision-makers in nutrition.

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