Nutrition Modeling Consortium

October 31 – November 1, 2019
Meeting Report

World Trade Center
New York, NY

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This report was written by Kara Greenblott, under a consulting contract with The New York Academy of Sciences.

This document is a record of presentations, discussions and agreements that occurred during this meeting. The ideas expressed by individual participants are not necessarily endorsed by the NMC as a group.

Executive Summary

Introduction: The fourth meeting of the Nutrition Modeling Consortium (NMC) was held from October 31 to November 1, 2019 at the New York Academy of Sciences (NYAS) in New York. The content of the two-day meeting included the introduction of various new modeling tools; updates from member-modeling teams; and an interactive 'speed-dating' session designed to enhance strategic collaboration between members. Additionally, there were presentations and in-depth discussions around the mapping of tool applications and data; the value-added that the Consortium brings to its members and the wider nutrition community; and discussions about the future of the NMC in terms of thematic focus and funding potential.

New Modeling Tools: The following initiatives were introduced to the Consortium: 1) The Cost of Not Breast Feeding (CONBF) (Dylan Walters, Alive and Thrive/ Nutrition International); 2) the Biofortification Priority Index (BPI) (Ekin Birol, Harvest Plus); 3) the Multiple Micronutrient Supplementation (MMS) Cost-Benefit Tool (Jennifer Busch-Hallen, Nutrition International; 4) the Global Individual Food Consumption data Tool (GIFT) (Victoria Padula de Quadros and Rita Ferreira de Sousa, FAO/WHO); 5) the Innovative Methods and Metrics for Agriculture Nutrition Actions (IMMANA) Evidence and Gap Map (Thalia Sparling, IMMANA); and the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) (Keith Wiebe, International Food Policy Research Institute (IFPRI))

Speed-dating: The interactive (speed-dating) session enhanced each modeler's knowledge of the tools that they were paired with; and in some cases, also launched initial conversations towards future collaboration. Participants discovered areas of compatibility, possibilities for co-location; and potential for synergy and bridging of gaps. Common challenges were identified, and brainstorming was initiated towards overcoming them. One modeling team representative whose tool has not been in existence for as long as others noted that valuable lessons were imparted by those with more experience.

Several members reported being surprised to discover updates and modifications to some of the tools, which reinforced for them the idea that improved dissemination and promotion of the tools (to the nutrition community) is vital. Each tool answers specific policy questions and the more they collaborate, the more they can make the most of one another's unique features, bringing a wider range of benefits to the end user. Finally, it was noted that collaboration must be strategically planned and doesn't necessarily evolve organically from co-location.

Mapping of Tool Applications; Data Mapping and Case Studies: Polling of the members indicated relatively strong interest in continuing to update / maintain the excel matrix that maps when various tools have been (or plan to be) applied in countries. The group was also interested in collecting and mapping more details such as sub-national locations, analysis questions and themes, and who was involved. The group indicated less interest in taking on a data mapping initiative, noting that it would take substantial resources and would not necessarily be utilized over time. Finally, the six, recently-completed case studies were presented, which are now available on the NMC website. They include Micronutrient Intervention Modeling Project (MINIMOD) (Cameroon), Cost of the Double Burden (Ecuador), Optifood (Guatemala), the Lives Saved Tool (LiST) (Malawi), the Cost of Hunger in Africa (COHA) (Mozambique), and the Cost of the Diet (CotD) (Pakistan).

Conference participation: There are two upcoming conferences that appear ideal for reaching the NMC's target audience; in particular, country-level end users. They are the Agriculture, Nutrition and Health (ANH) Academy Week (June 29th through July 3rd in Malawi) and the Micronutrient Forum (MNF) 5th Global Conference 2020 (March 23 – 27 in Thailand). The group decided to take a 'case study' approach for both conferences, aiming to help the audience understand where the tools are useful in the overall planning process. The individual tools would not be explored in detail, but instead it would be an opportunity to learn what policy questions they are each capable of addressing. For the ANH conference, the NMC decided to apply for a Learning Lab session, and for the MNF, they will apply for both a Learning Center session *and* a booth, to facilitate more in-depth, one-on-one discussion. NMC members offered to assist in staffing the MNF booth during the conference.

Value Added of the NMC: Meeting participants cited a variety of ways in which the NMC has provided added value to its members. Here are just a few:

- Prior to forming the NMC, the existence and purpose of these tools was unknown and / or confusing, both to end users and tool developers. Due to the knowledge sharing and relationship building that has taken place, members are now more conversant on the purpose of each tool and are capable of guiding end users to one that is suitable to their specific needs.
- From a donor perspective, the NMC offers an opportunity to see how the tools fit together, overlap and complement one another so that they can better assist countries in answering their policy questions.
- The relationship between USAID and the NMC has led to a number of presentations and a webinar about the tools to USAID and its partners."
- The NMC's website offers a centralized repository of all the tools; their applications and results; and other related literature. Previously, this information was in disparate locations, primarily on individual member-websites.
- NMC meetings have helped modeling teams to recognize common challenges, e.g. having to send in technical experts to conduct the analysis and struggling to translate modeling results into policy changes. As a group, members are now able to discuss and strategize around these challenges, and approach them with more understanding, thoughtfulness and resources.
- The NMC has created a community of individuals that feel comfortable interacting in the context of potentially thorny issues. For example, when two tools produce differing results on the same topic or for the same context, the modeling teams are more likely to make direct communication with one another and jointly explore and explain discrepancies, and to help end users understand them as well. Without these relationships, there is a higher likelihood of argument or misunderstanding over whose results are 'correct'.

Future Funding Prospects: The Bill & Melinda Gates Foundation (BMGF) is currently undergoing a restructuring and is not able to make funding commitments at this time. They do, however, hope to (eventually) provide continued funding to NYAS for the core convening function (i.e. regular NMC meetings), which they view as vital. With the intention of continuing beyond the end of the current grant, NYAS has begun exploring future funding with two primary donors; the Rockefeller Foundation and the country of Jordan.

***Rockefeller Foundation*:** NYAS sent a concept note to the Foundation's 'Precision in Public Health' Initiative and discussions are ongoing. Next steps include conversations with their Food Initiative team, whose mission they felt was more aligned with the NMC's goals. The BMGF has an excellent relationship with Rockefeller and has offered to facilitate any introductions that might assist towards securing funding.

Jordan: Promising conversations have begun around the possibility of implementing several modeling tools using data recently collected by UNICEF in Jordan. The data comes from a nation-wide micronutrient (MN) survey, which includes samples from Syrian refugee populations, as well as host communities. Buy-in from the country is good, offering strong prospects for translating results to changes in policy. Next steps include a presentation by NYAS about the NMC to the Ministry of Health in Jordan, which is likely to take place in December or January.

On a final note regarding funding, the NYAS is about to receive a grant from the Botnar Foundation to examine how the occupational status of adolescent girls determine their nutrition status in four lower-to-middle income countries (LMICs). This initiative will likely use the CotD and Optifood tools as part of this research, demonstrating how the tools can be layered onto other initiatives that are receiving funding.

The Focus of Future NMC Meetings: Meeting participants articulated several topics that they would like to see included in the agendas of future NMC meetings:

Greater promotion of the NMC and its tools: Several members felt that more should be done to promote the NMC and its tools to the nutrition community, including nutrition departments of various organizations and academic institutions. Ideas included developing a core set of power point slides, or a 'dissemination toolkit', that members could use as needed; posting the NMC website link on member websites; and including the NMC logo in all presentations that members give, in order to communicate that they are members of this community of practice.

Country-level Decision Making Processes: Members requested a session dedicated to learning about decision-making spaces / processes at the country level. Topics might include: What are the trends in how governments fund their global health and nutrition programs domestically? How many of these countries are starting to think about

universal health coverage? Is sector-wide programming still driving the decision-making process? And how does nutrition figure into the various sectors' packages? A meeting on this topic would help members to better understand the policy environment and view members' tools in the context of that decision-making space.

Inclusion of end-users: Inclusion of end-users was an initial objective of the NMC but has not been prioritized to date. It would be useful to discuss how future funding might be used to support regional meetings for this group and prioritize end-user involvement in future conversations. This would ensure that end users are better informed about ways in which modeling tools can influence policy environments. It would also assist in capacity building and knowledge transfer to the country level.

Future membership: The NMC membership has grown incrementally with the recruitment of several additional modeling teams over the past two years. It would be helpful to discuss whether there is a desire to expand the membership even further, or whether members would instead prefer to maintain its current numbers. Finally, the initial graphic that placed member-tools on the planning cycle still includes only the original members. The group should discuss whether additional tools should be incorporated into that graphic. If NMC members agree to expand membership, the inclusion criteria for future members and their tools also requires consideration.

October 31 – Day One Proceedings

Welcome, Introduction and Updates

Gilles Bergeron

This is the fourth meeting of the NMC, and the second from the last under the current grant from the BMGF. The agenda for this meeting can be found here. Andrew Thompson of OMNI was warmly welcomed as the newest member of the Consortium. Representatives from additional modeling tools and initiatives will be joining via WebEx throughout the course of the meeting.

The meeting will begin with presentations on modeling tools and other associated initiatives that the NMC has become aware of over the past several months. These tools are either directly or peripherally connected to our work and include:

- The Cost of Not Breastfeeding (Alive and Thrive / Nutrition International)
- Biofortification Priority Index (HarvestPlus)
- MMS vs Iron and Folic Acid (IFA) Cost Effectiveness and Policy Decision Tool (Nutrition International)
- GIFT: Mapping and providing access to dietary data sets (FAO/WHO)
- Gap Map to understand existing tools that explore the links between agriculture & nutrition (LCIRAH) (IMMANA)
- IMPACT (IFPRI)

In addition to presentations from guests, several of the NMC members will update the group on progress and recent initiatives related to their tools. USAID's flagship multi-sectoral nutrition project entitled USAID Advancing Nutrition will present on their goals, activities and current / planned collaboration with the NMC. This will be followed by updates on the NMC mapping of 1) past, current & future tool applications, and potential data sources; and 2) presentation of the six recently-published case studies that were distributed in hard copy to the group.

The core interactive exercise for this meeting is a 'speed dating' activity, which was designed to facilitate increased coordination and collaboration between the modeling tools. A list of suggested topics/questions has been provided for those sessions. Finally, the group will discuss strategies to enhance reach and impact on end users, and how the group envisions the future of the NMC. This will include a discussion of the NMC's perceived 'added value' and possibilities for future funding.

Introducing More Modeling Tools: Expanding Our Vision

The Cost of Not Breast Feeding Tool (CONBF)

Dylan Walters

The CONBF tool was developed by Dylan Walters with support from Alive and Thrive (A&T), and funding from the BMGF. Its goal is to make information accessible to policy makers on the health and economic impact of not breastfeeding. It advocates for over a hundred countries to support domestic advocacy, policy change, and investments in breastfeeding. The CONBF is a relatively simple, evidence-based modelling tool that uses open access data to estimate the health and economic costs of not breastfeeding (i.e. cost of illness / exposure to breastmilk substitutes). As its name implies, it answers a single policy question: 'What are the costs of not breastfeeding?'

The CONBF tool utilizes 25 indicators under four main types of cost: 1) morbidity and mortality, 2) health system, 3) cognitive losses, and 4) cost to the household of using breastfeeding substitutes. Results can be generated at country, regional and global levels to support advocacy efforts. There is an interactive on-line tool available for generating results for 30 countries and accessing custom policy briefs, with more countries to be added in the future: https://www.aliveandthrive.org/cost-of-not-breastfeeding/

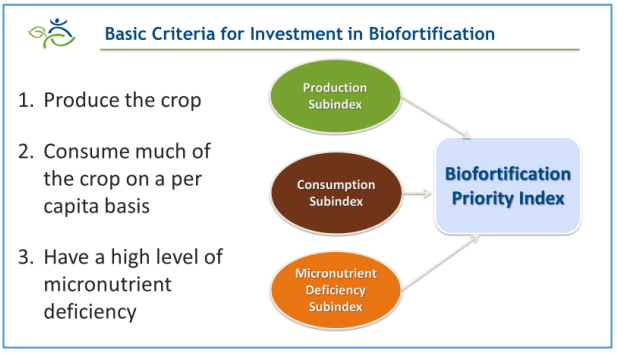
The CONBF tool is currently being used for several different knowledge translation purposes through both Alive and Thrive and the Global Breastfeeding Collective. They are disseminating policy briefs, engaging with policy makers, and conducting on-line promotion through social media and videos. They would be grateful to the NMC for any assistance in promoting the CONBF tool to country-level policy makers, and they look forward to future opportunities for collaboration with respect to improving data and modeling related to breastfeeding and Infant and Young Child Nutrition (IYCN) interventions.

Questions & Answers:

Biofortification Priority Index

Ekin Birol

Harvest Plus uses conventional plant breeding methods to improve staple crops so that they deliver higher levels of vitamins and minerals. In 2012, they began delivery in several countries, and shortly afterwards, World Vision (WV) approached them to integrate biofortification into their agriculture programming. The BPI is an index and a tool, which ranks 128 LMICs according to the key staple crops potential for impact in addressing MN deficiencies. The three criteria for biofortification are listed in the image at right.



The BPI has sub-indexes for production (measures intensity of crop production); consumption (measures magnitude of per capita consumption of crop supplied by domestic production); and for vitamin A (VA), iron and zinc (measures the extent of MN deficiencies). Using the formula at right, the BPI then scores, ranks and prioritizes countries for suitability for biofortification.

$$BPI = \sqrt{(\sqrt{PI \times CI}) \times MDI}$$

PI – Production Subindex
CI – Consumption Subindex
MDI – Micronutrient Deficiency Subindex

The website for the BPI is interactive and allows users to select by biofortified crop and view all the countries using that crop as well as their prioritization. It also displays the top 20 countries that would most benefit from introduction of that crop, along with other details about its agronomic and nutrition benefits. The user can also search by 'country' to see what biofortified crops have been released in that country, and what crops are suitable for introduction.

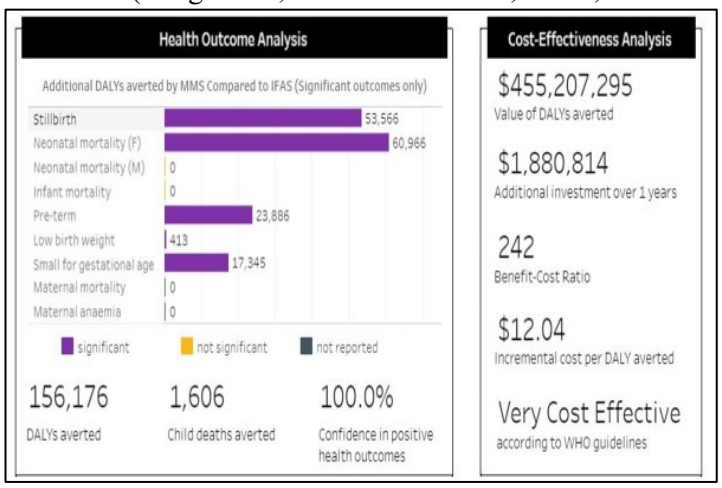
Several partners have begun using this tool: WV uses it annually to strategize on where to introduce biofortified crops; talks are underway to link the BPI with the Global Alliance for Improved Nutrition's (GAIN's) Global Fortification Data Exchange tool; and the World Bank is using it for their Nutrition-Smart Agriculture Strategy to see where it makes the most sense to invest in biofortification. The tool can be found at https://bpi.harvestplus.org/.

Questions & Answers:

MMS vs IFA Cost Effectiveness and Policy Decision Tool (Nutrition International)

Jennifer Busch-Hallen

Recent evidence has encouraged LMICs to consider transitioning from long-standing iron and folic acid supplementation (IFAS) to MMS for antenatal care programs. In one study, a cost effectiveness analysis compared MMS to IFAS in three high-burden countries in Asia (Bangladesh, India and Pakistan; Kashi, et al.), considering such outcomes as neonatal mortality, pre-term birth and small for gestational age. Another study (on Bangladesh and Burkina Faso) showed similar results, both confirming that moving from IFAS to MMS is cost effective in these contexts and generates positive health outcomes for infants and pregnant women (Engle-Stone, et al.). In response to requests for guidance on making this transition, Nutrition International used the rigorous research methodology in the Kashi study to develop the MMS Cost-Benefit Tool, an easy-to-use tool that calculates the incremental benefits and costs of transitioning from IFAS to MMS in any country. The tool was designed for Nutrition International's in-country counterparts and their governments, and to answer the question that they had been repeatedly asking: Is MMS better value for money than IFAS? The tool estimates the impact of MMS compared to IFAS for all significant health outcomes and calculates budget impact, cost-effectiveness, and return on investment (see graph above). Beyond calculating these results, the tool's purpose is to support the knowledge translation of economic evidence on IFAS and MMS for countries' decision and policy makers. To aid in advocacy, Nutrition International has constructed six-page policy briefs for the 12 countries that have preloaded data as well as adaptable PowerPoint slides.



The MMS Cost Effectiveness Tool is evidence-based, rapid, timely, and does not require data entry once the basic information is pre-loaded, unless users choose to enter more data to conduct analysis at a sub-national level. Users can construct and test different scenarios by updating the assumptions within the tool or running a Custom Analysis. Up to eight health outcomes are included in the analysis and aggregated using disability-adjusted life years (DALYs). It's interesting to note that for all 12 countries currently loaded, the transition is shown to be either 'very cost effective' or 'cost effective'.
MMS Cost Benefit Tool Website

Questions & Answers:

FAO / WHO GIFT Platform

Victoria Padula de Quadros and Rita Ferreira de Sousa

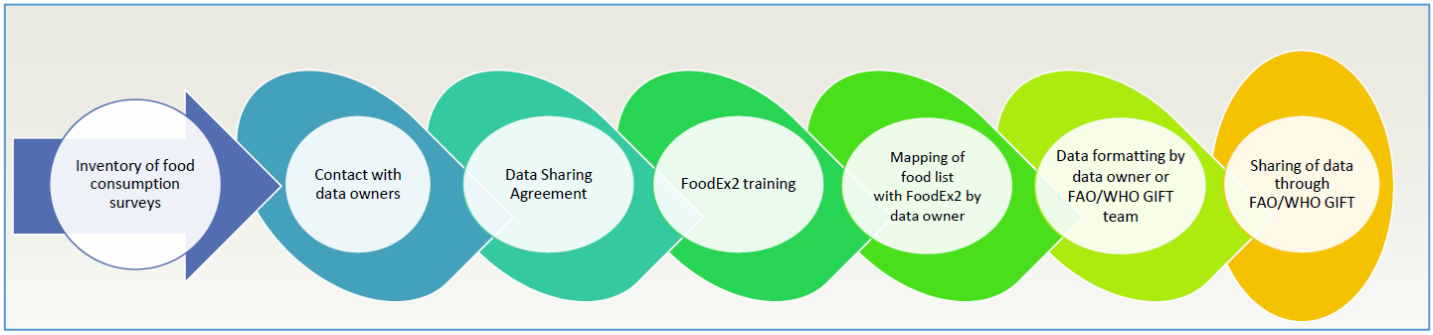
The GIFT platform is a collaborative initiative between FAO and WHO that collates individual food consumption data (24-hour recall) from around the world, and makes it available free of charge, hence the GIFT acronym. GIFT also provides the ability to analyze these data online and generate indicators for nutrition and food safety. There is also an interactive map that shows the details of hundreds of existing dietary surveys around the world and can be used to identify existing data (even if not yet available on the GIFT platform).

GIFT began six years ago; it took five years to build the platform and in their sixth year the team began to populate the database with food consumption data. To date, there are data sets from eight countries and the number continues to grow. Not all the data sets currently in GIFT are nationally representative; there are sub-national data sets as well. Indicator categories include food consumption, nutrient consumption and food safety, and all data is disaggregated by age and gender. The tool utilizes an abundance of infographics to help policy makers without technical backgrounds to understand the messages.

Anyone can download and use the data sets once they have signed the user agreement declaring their intended use and agreeing to apply the requisite citations. NMC members may find the inventory function useful: surveys are listed and color-coded to delineate: 1) those data sets that are already loaded in GIFT; 2) those that are in the pipeline; and 3) those that exist but the GIFT team has not yet reached out to their owners. A mapping function displays the number of surveys in each country with details about each survey.

The GIFT team is in the continuous process of taking an inventory of surveys throughout the world and contacting owners of data sets. For each new data set, they go through a process of introducing the GIFT project; validating eligibility criteria; asking questions related to weighting; and setting a timeline with the owner for the process of data sharing. The process also includes a six-hour-long training by video conference to harmonize the data (using a food classification and description system); data mapping and formatting; and finally, public dissemination. See process map below. Having received a four-year grant from the BMGF last year, the GIFT team intends to add at least 50 additional data sets, including additional dietary indicators, over the life of the grant. A recent journal article in the Proceedings of the Nutrition Society provides a detailed examination of GIFT and its benefits and challenges.

Questions & Answers:



IMMANA: Gap Map to Understanding Tools that Explore the Links between Agriculture & Nutrition (LCIRAH)

Thalia Sparling

12 DOMAINS
Primary food production (growing, cultivating, raising, etc.)
Value chains and food transformation
Food safety
Economy
Markets
Food environments
Water, Sanitation and Hygiene
Ecology, sustainability and environment
Food policy, governance, trade, MSPs
Conflict of interest
Food security
Diet, nutrition and health

IMMANA has produced an evidence and gap map that aims to: 1) identify innovation in tools, metrics and methods for research on food systems and agriculture-nutrition linkages in the last ten years, and map them onto existing conceptual frameworks; and 2) highlight opportunities for future development, addressing gaps and bringing newer developments into wide-spread use. Like other evidence and gap maps, it seeks to reveal the evidence that exists, and that doesn't exist, but does not analyze or qualify the strength of that evidence.

The IMMANA mapping tool is different than previous evidence and gap maps in that it focuses on the mapping of 'methodologies' rather than mapping intervention 'effectiveness'. An extensive literature search was conducted (over 30,000 reports), screening for either agriculture and food systems, or nutrition and nutrition-related health, including tools, metrics or methods developed or newly applied since 2008. Data was mapped for 12 thematic domains (rows) against categories of tools, methods and metrics (columns). To date there are 847 items mapped; see the 12 domains listed at right.

Links to the evidence and gap map, along with its web portal and other resources are found below.

ANH Academy: https://www.anh-academy.org/evidence-gap-map
- Evidence and Gap Map
- Tutorials and presentations
- RFPs for grants and fellowships

Evidence and Gap Map protocol with full methodology:
https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1035
Web portal: https://eppi.ioe.ac.uk/webdatabases4/Intro.aspx?ID=18
- Username: IMMANA
- Password: nutrition

Questions & Answers:

Overview of USAID Advancing Nutrition & Relevant NMC-Related Activities

Monica Woldt

USAID Advancing Nutrition is USAID's flagship, multi-sectoral nutrition project that builds on the Agency's past nutrition investments and works to support the US Government's Global Food Security Strategy and the USAID Multi-Sectoral Nutrition Strategy to address the many causes of malnutrition. It's a five-year (2018-2023) project and is a follow-on from the Food and Nutrition Technical Assistance Project (FANTA) (FHI 360) and the Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project (John Snow Inc. (JSI)). It is a centrally funded contract with Mission buy-in and currently has funding from three USAID Bureaus –

Global Health; Food Security; and Democracy, Conflict and Humanitarian Assistance, and three USAID Missions: Kyrgyz Republic, Mozambique, and Tanzania

USAID Advancing Nutrition has three broad goals:

1. Scale up high-impact nutrition interventions and services
2. Strengthen country commitment and capacity for multi-sectoral nutrition programming
3. Generate evidence and facilitate learning and innovation for improved nutrition

In relation to the NMC, USAID Advancing Nutrition has already begun sharing information generated by the NMC with USAID staff in D.C, the USAID Missions, and USAID's partners. Presentations have been made on the Fill the Nutrient Gap (FNG), CotD and PROFILES, and they recently hosted a webinar on tools to identify nutrient gaps and ways to address them, including FNG, CotD, Optifood and GIFT, among others. There are also plans for upcoming presentations on Strengthening the Economic Evaluation of Multi-Sectoral Strategies (SEEMS) for Nutrition, Agrifood, MINIMOD and Optima Nutrition. USAID Advancing Nutrition is increasingly focused on diet quality and understanding what tools exist to identify the specific nutrient gaps in addition to tools that can then help with prioritizing solutions. They look forward to broadening links and collaboration with the NMC going forward. For more information, they can be found at: www.advancingnutrition.org.

Questions & Answers:

Updates from the Consortium

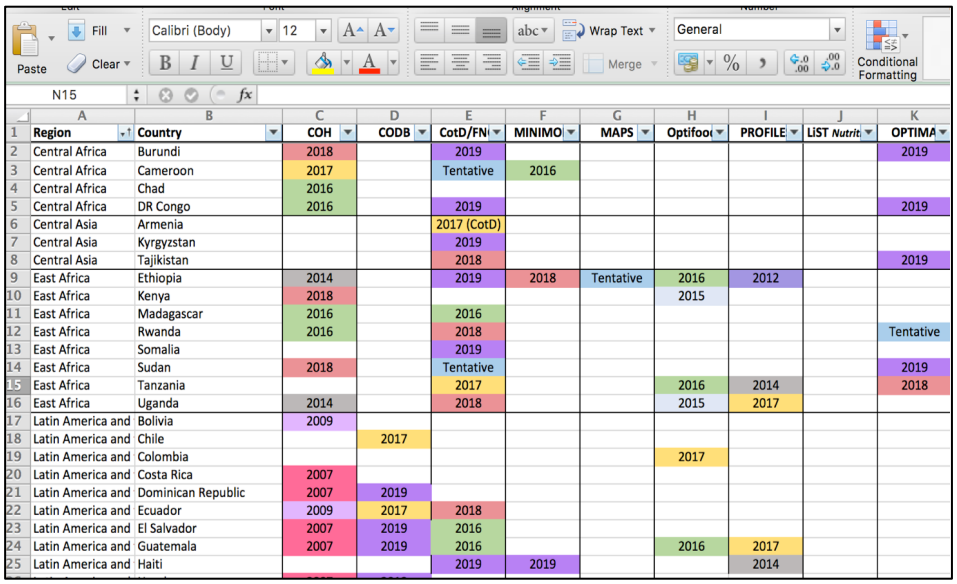
Mapping Past, Current and Future Tool Applications, and Potential Data Sources

Frances Knight

This session was primarily designed to obtain input from the group on 1) whether (or not) to invest *further* NMC resources in 'mapping of the modeling tool applications in countries', and 2) whether (or not) to *begin* 'mapping potential data sources.'

There are two presentations for this session, see above left. The first displays the results from the polling exercise that was done to gauge the group's interest in the mapping exercises; and the second covers the content of this session.

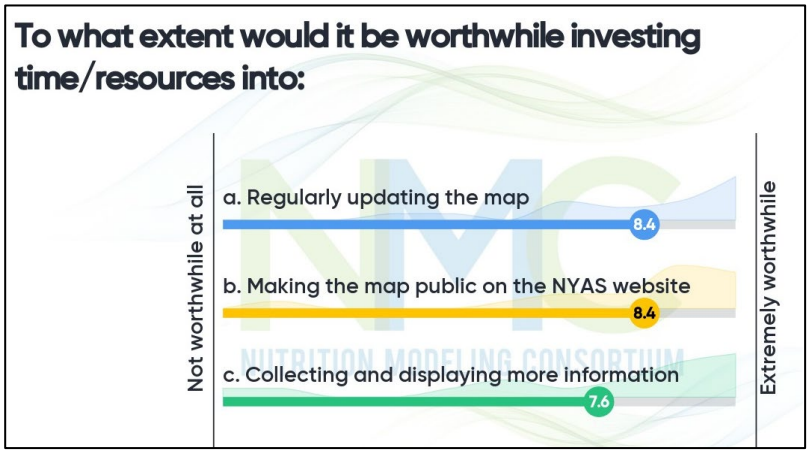
Mapping of Tool Applications:
Initially, all the tools were mapped to identify potential interview participants for evaluations. This mapping eventually became useful for FNG work, as well as for informing current and future analyses and planning of NMC activities. The mapping currently exists in a relatively basic excel spreadsheet and records each tool and the year that it was applied (or will be applied) in various countries. It is perhaps more aptly referred to as a 'matrix' (see image at right)). It represents the breadth and reach of the collective work of the NMC and identifies opportunities for potential collaboration and cross pollination. In its current format, the data is static and

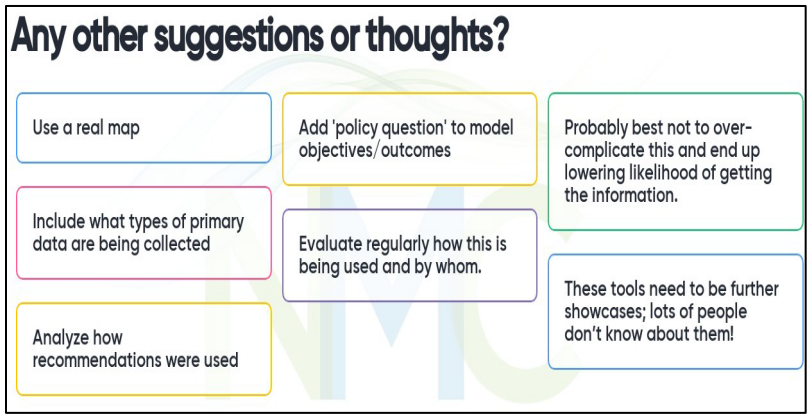


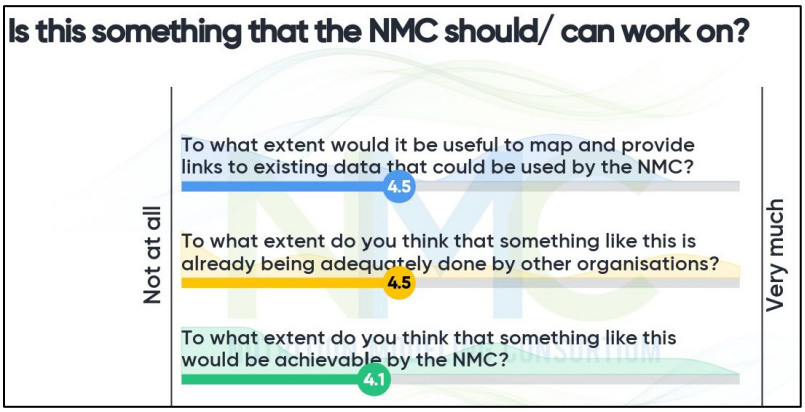
Region	Country	COH	CODB	CotD/FNI	MINIMO	MAPS	Optifoo	PROFILE	LiST Nutriti	OPTIMA
Central Africa	Burundi	2018		2019						2019
Central Africa	Cameroon	2017		Tentative	2016					
Central Africa	Chad	2016								
Central Africa	DR Congo	2016		2019						2019
Central Asia	Armenia			2017 (CotD)						
Central Asia	Kyrgyzstan			2019						
Central Asia	Tajikistan			2018						2019
East Africa	Ethiopia	2014		2019	2018	Tentative	2016	2012		
East Africa	Kenya	2018					2015			
East Africa	Madagascar	2016		2016						
East Africa	Rwanda	2016		2018						Tentative
East Africa	Somalia			2019						
East Africa	Sudan	2018		Tentative						2019
East Africa	Tanzania			2017			2016	2014		2018
East Africa	Uganda	2014		2018			2015	2017		
Latin America and	Bolivia	2009								
Latin America and	Chile		2017							
Latin America and	Colombia						2017			
Latin America and	Costa Rica	2007								
Latin America and	Dominican Republic	2007	2019							
Latin America and	Ecuador	2009	2017	2018						
Latin America and	El Salvador	2007	2019	2016						
Latin America and	Guatemala	2007	2019	2016			2016	2017		
Latin America and	Haiti			2019	2019			2014		

relies on periodic emails to NMC members in order to stay up to date.

The graphic at top right was generated by polling the group and indicates relatively strong interest in updating the map; making it available on the NMC website; and adding more information to the matrix. The middle graphic at right lists some of the suggestions made by members with regards to improving the matrix. Finally, the bottom right graphic indicates moderate interest in mapping data.







The group agreed that if the NMC decides to move further with this mapping tool / matrix, it would require a dedicated person to keep it up to date. It might be useful to include an indicator of 'what is driving the need for a particular tool in a country', e.g. if they are moving towards universal health care or some other country-wide trend. It could also include information related to sector-wide programming under the World Bank, which drives in-country initiatives in terms of timing and what tools they need during their planning cycle.

Mapping of Potential Data Sources: In the early months of the NMC, the idea of mapping data sources was raised, but the group hasn't discussed it since. Interestingly, this session follows the presentation of the GIFT platform, where it was noted that GIFT has been active (collecting data) for just one year, following five years of building the platform. As noted in the third graphic from the top, the NMC participants did not voice strong interest in taking on a data mapping exercise. Participants noted that while these types of exercises appear useful initially, they frequently don't get utilized; don't get maintained; get superseded by other efforts; and are very challenging to sustain and generate demand for use.

Compendium of Case Studies

Frances Knight

Thus far, six case studies have been developed featuring the following modeling tools: MINIMOD (Cameroon), Cost of the Double Burden (Ecuador), Optifood (Guatemala), LiST (Malawi), the Cost of Hunger in Africa (COHA) (Mozambique), and the Cost of the Diet (CotD) (Pakistan).

The objectives of this exercise were to: 1) Increase awareness about individual tools and the NMC amongst end users, and 2) Present tool applications and lessons learned to end users in an easily digestible format.

All the case studies are written in the same format to facilitate the comparing and contrasting of features of the various tools, and how they've been used in different countries. What's unique about these case studies is that they not only describe the actual analysis and results, but they also investigate 'why' the analysis was done to begin with, and in what ways the results were used in country, which isn't always found in the literature. Finally, the studies explore the challenges and opportunities that arose in applying the tools in each country.

The NMC intends to develop additional case studies prior to the ending of the current grant. Thus, if any of the modeling teams are interested in having theirs documented, they should contact the NYAS secretariat.

The six case studies can be found on the NMC Website.

Modeling Tool Updates

OMNI

Andrew Thompson

Outcome Modeling for Nutrition Impact (OMNI) is used for program planning and essentially answers the question: how should a specific amount of money be allocated in order to achieve the greatest impact? OMNI brings together program coverage data from the field (or *predicted* program coverage), and intervention efficacy values, in order to compute nutrition and health outcome estimates for existing or future interventions. It deals with health outcomes including child deaths averted; anemia cases averted; low birth weight cases averted; stunting cases averted; neural tube defects averted; and mental impairments averted.

OMNI can assist programmers to select between interventions, decide where an intervention should take place in order to have the greatest impact, understand how much human capital is required; and, ultimately, decide how and where to allocate resources. It was developed in response to the perceived need of Nutrition International and its partners to more effectively harness existing data in order to estimate the impacts of programs and inform decision-making about nutrition investments.

The OMNI tool is fit for purpose; evidence-based; and is regularly reviewed and updated. It's also relatively easy (and quick) to use and optimizes the application of both universal evidence and context-specific program data. Users require a basic aptitude with computers; an understanding of program coverage and knowledge about the intervention in question. A more technically savvy user can use the tool for retrospective impact reporting as well as *prospective* impact reporting. And while not required, more users with programming knowledge can modify the evidence base (instead of using the default data) to inform estimates of coverage.

OMNI uses an impact pathway to examine an intervention in terms of its nutrition and health outcomes, and the mortality and morbidity impacts. It might, for example, examine IFA interventions looking at reach, coverage and the anemia burden, see below, to estimate the number of anemia cases averted by a given program. OMNI has also been used in the treatment of diarrhea with zinc and ORS among children 1-59 months of age. By identifying reach, coverage and burden, OMNI can estimate the number of child deaths averted. Other examples can be found on the OMNI website.

Reducing the burden of anaemia among pregnant women in country X through IFA:

- **Reach**: A specific area of country X is targeted, reaching ~400K pregnant women
- **Coverage**: an additional 35% of pregnant women consume 90+ IFA after implementation
- **Burden**: 58% of pregnant women are anaemic in country X
- **Burden**: 42% of anaemia among pregnant women is due to iron-deficiency in country X

There are six basic steps to using the OMNI tool, see graphic at right, with the data entered in step 5 being the 'coverage' data. For more granular details (i.e. methodology, literature references, effect sizes, etc.), users can refer to the OMNI website. One unique aspect of the tool is that no matter where you start, the tool helps you through the next steps, and information on any of the steps can be easily modified at any time.

OMNI is currently preparing for expanded beta testing, user training and ongoing knowledge translation (including expansion of the user guide to include new features of the tool; in-depth guided examples; and documentation of successful applications of the tool). OMNI is not yet publicly available for download; though access can be obtained with permission via the website.

OMNI in Action

How to use the OMNI Tool

- Step 1: Select Scenario
- Step 2: View Scenario Selections
- Step 3: Define Country(ies)
- Step 4: Define Duration
- Step 5: Data Entry
- Step 6: Calculate Results

Questions & Answers:

MINIMOD Update

Steve Vosti

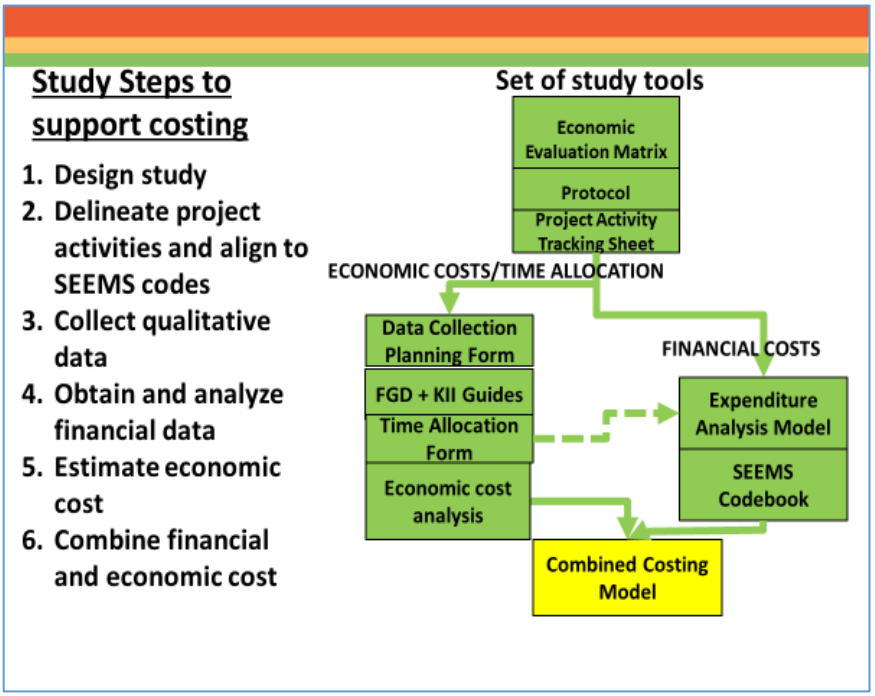
The MINIMOD team continues to develop the 'full' MINIMOD tool, which uses detailed dietary information. They are also working on developing a 'simplified' version of MINIMOD, which will have all three components (benefit estimates, cost estimates and economic optimization), but only requires standard 'secondary' data, making it accessible to a wider range of users. They are comparing results ('full' vs 'simplified') in both Cameroon and Ethiopia, and in many cases, they've been pleasantly surprised at how close the results have been.

The MINIMOD team is also working closely with Kevin Dodd at the National Cancer Institute to put together methods that will generate improved metrics in several areas, including: 1) improved estimates of nutrient intake based on single-recall (note: the gold standard is to have repeat observations for 20% of the sample of those originally interviewed); and 2) how to deal with the thorny issue of 'within' versus 'across-individual' variation in MN intakes, particularly in the context of single-recall dietary intake data.

In addition to its continuing work in Cameroon and Ethiopia, the MINIMOD team just received additional funding to expand to Senegal, Burkina Faso and Nigeria. They recently spent six months training their partners in Ethiopia and concluded that it was too time consuming using the current training approach. The MINIMOD team therefore developed Mega Macro, which uses dietary intake data to estimate MN deficiencies (and their impacts on MN intervention programs); however, it is a simpler tool that is more accessible to collaborators in LMICs who may not have strong programming skills. This represents a huge leap forward in facilitating access to users.

MINIMOD recently hired full-time policy engagement specialists; one for West Africa and one for Ethiopia. These staff are constantly nudging and reminding policy makers that the tool exists and what it can do for them. This work has prompted the reactivation of the fortification group in Cameroon, which was dormant for a long period, and has since collected data on oil and wheat flour fortification and found that that fortification program is performing well.

GAIN and MINIMOD have started a partnership to update GAIN's tool for in-country consultations on the fortification of edible oils. This was test-driven two weeks ago and went reasonably well, but it became clear that even for these spread-sheet-based tools, it's very time-consuming. They are therefore proposing a two-round approach where technical experts first address a round of questions, then bring in other stakeholders for only the second round. MINIMOD has also begun working with the Global Alliance for Vitamin A (GAVA) to determine under what circumstances countries should scale back their very expensive VA supplementation interventions. There are a lot of thorny issues and MINIMOD is assisting by sharing their results and policy pathways. Other initiatives include MN-fortified bouillon cubes in Ghana and an examination of the cost effectiveness of VA supplements in sub-Saharan Africa.



SEEMS Nutrition

Carol Levin

SEEMS is not yet a modeling tool, per se, but with the inspiration of the NMC members to date, it will likely develop into one. SEEMS is a three-year project funded by the BMGF and focuses on multi-sectoral nutrition interventions. To date, there is a lack of guidance on economic evaluation of multi-sectoral actions for health and nutrition. This project aims to develop a framework that helps understand the *comprehensive* set of benefits from these programs, including both nutrition-specific and nutrition-sensitive interventions.

Cost Efficiency — Malawi Case Study

Cost	Population		Cost/reached	
$186,832	Pre-School Children	1017	$182	per child
	Beneficiaries	4806	$39	per beneficiary
	Households	900	$206	per household

SEEMS is in the process of developing guidance and a set of tools which generate evidence on cost, cost-effectiveness, cost-benefit, cost-efficiency and cost-utility of these interventions. They also aim to move the field toward standardization (e.g. cost per child reached), so that results are comparable across settings and interventions. The framework is described in detail in the *ANH Technical Brief: Economic Evaluation of Multisectoral Actions for Health and Nutrition*, which lays out the guidance and steps for applying economic evaluation. SEEMS is currently putting into place tools to integrate cost analysis into ongoing projects, (alongside impact evaluation), in the following countries, (with the following partners): Bangladesh (IFPRI), Burkina Faso (IFPRI), Kenya (IFPRI), Kenya (GAIN), Malawi (IFPRI), and Nepal (Helen Keller International (HKI)).

As a community, we know how to measure single outcomes, or even combined outcomes (e.g. a DALY), but the most challenging objective is to measure the *aggregated* benefit of multi-sectoral strategies; particularly in terms of incorporating more abstract themes such as women's empowerment. It's important, however, to be explicit in recognizing that there is a full range of benefits from multi-sectoral interventions. The figure above details the study steps and tools to support costing, with an example (below it) of one set of results from a cost efficiency study conducted in Malawi.

NMC members are invited to attend the IFPRI-hosted Policy Seminar on the Malawi Early Childhood Development NEEPIE project on November 6th. Detailed results from the costs analyses on this project will be presented by SEEMS. Further information on the SEEMS project can be found by watching the ANH-hosted Ag2Nut Seminar facilitated by Carol Levin and James Levinson (Tufts University).

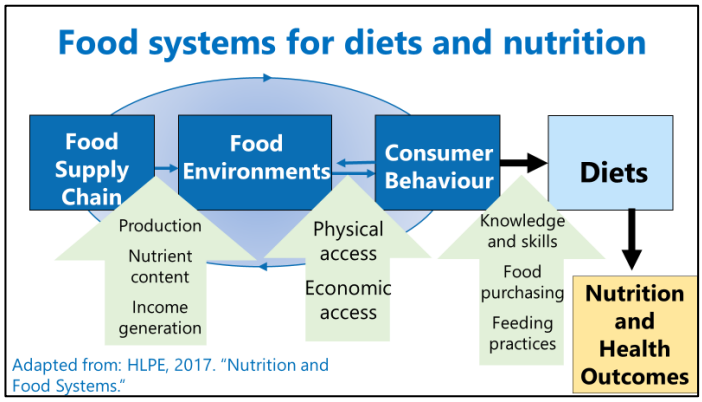
Fill the Nutrient Gap (FNG)

Saskia de Pee

This presentation is a recap and update of the FNG approach (which uses the CotD tool). The FNG was developed in 2015 and piloted in 2016; and since 2017, has been applied in approximately ten countries per year. The 32 countries where it's been applied vary dramatically in terms of size, income and context. Countries typically request and pay for the analysis, with some analyses requested for specific situations, e.g. comparing access to nutritious diets for refugees in camps versus access to nutritious diets for host communities.

The FNG is the overarching framework, which includes both the Cost of the Diet (CotD) analysis *and* a review of literature and other secondary data analyses answering questions such as: 'Are nutritious foods available, accessible and chosen for consumption?' The FNG uses a complex data mapping spreadsheet, which covers all of the components of food systems, see figure below emphasizing the links between diets and nutrition / health outcomes.

The CotD answers the question: 'What would be the cost of a diet that would meet macro and micro-nutrient requirements at the lowest possible cost', considering local food availability and cost as well as average staple consumption. These diet costs are compared to actual food expenditure to estimate how many in the population would be able to afford a nutritious diet. This is then used as a baseline to compare against 'what if' scenarios to see the potential of various interventions to improve access to nutritious diets. The FNG focuses on how to improve the affordability of nutritious diets and can help prioritize existing or proposed interventions for effective, multi-sector intervention packages.



Every FNG analysis has a strong focus on nutrition, looking at trends over time, correlations between nutritional status and diet affordability, and other food environment and food systems aspects. The FNG continues to develop a focus and expertise in areas such as cash and vouchers, school feeding, social protection, nutrition-sensitive agriculture, resilience, retail, gender, Social and Behavior Change Communication (SBCC), climate change, Water, Sanitation and Hygiene (WASH) and other support topics (e.g. South-South cooperation and communications).

Speed Dating Sessions

Speed Dating Recap by Participants

The following are summary statements of the discussions that took place between various members during the speed dating sessions:

SEEMS (Carol Levin): There is ample common ground between SEEMS and Optima. It will be helpful to follow Optima closely as they start to incorporate nutrition-sensitive interventions. It was interesting to discover that the PROFILES tool has been expanded. Essentially, beyond modelling for stunting, wasting, and underweight, and micronutrients; PROFILES now also has models that focus on early initiation of breastfeeding and neonatal mortality, breastfeeding and child mortality, breastfeeding and child obesity, and dietary diversity among children under two and stunting, and a model on teenage pregnancy related to childhood stunting. These are all new models within the PROFILES platform. Not knowing about this reinforces the idea that there is room for improving the dissemination of information on the NMC tools. People are looking for information and solutions that these tools offer, and unless the NMC disseminates that knowledge, there may be some reinventing of the wheel taking place.

OMNI (Andrew Thompson): OMNI is having similar experiences to the other modeling tools, which was helpful to hear. It would indeed be useful to bring more attention to the updates and modifications of tools when they happen. This session was an excellent learning opportunity for a newcomer to the NMC. The idea of 'layering' where various tools are co-located and capitalizing on different synergies was interesting. Furthermore, it appears that the low-tech mapping tool (i.e. the matrix) facilitates this well. It's practical and helps the group see where it makes sense to work together. The discussion with Optifood examined where one tool ends, and another can pick up, so again, building on different synergies and bridging gaps.

OMNI (Homero Martinez): It was very useful to have this type of more focused, one-on-one discussion with representatives from the various tools in the NMC. It was impressive to see how this technique really facilitated learning about one another's tools.

PROFILES (Kavita Sethuraman): The conversation with Micronutrient Action Policy Support (MAPS) was a helpful follow-on to a previous discussion on selenium, Malawi, land tenure challenges, and how farmers are resistant to investing in land if they don't own it. Given PROFILES vast experience in engaging strategically with different types of stakeholders, it has a lot to offer to other tools regarding this process. Discussion also took place with MAPS about economic productivity. Again, PROFILES has documented their experience on this front and can share with others. With SEEMS, they compared notes on the challenges of incorporating non-communicable diseases (NCDs) into modeling tools. And finally, with FNG, they discussed adapting the advocacy planning workshop methods detailed in the PROFILES manual to the FNG process, and how that can be used with any of the tools for strategizing on advocacy.

MINIMOD (Steve Vosti): There were several themes that came through in all four conversations: 1) *Co-location:* there is already a lot of colocation taking place; they don't always dovetail exactly, but they might do so either geographically or thematically. There is still ample opportunity for the tools to work together. Collaboration, however, won't be automatic. The teams will have to look at themes like data collection and the application of the tools in a very strategically coordinated way. Co-located activities don't need to be cotemporaneous; one can follow the other and still derive mutual benefits if there is ample preparation and coordination. 2) *Partners:* Many of the modeling tools will inevitably end up working with the same stakeholders and MINIMOD is happy to share contact information of their partners with other tools that plan to work in their countries. 3) *Comparative advantage:* Trying to identify and demonstrate comparative advantages of various NMC modeling tools in addressing policy questions would be extremely useful to all concerned, 4) Most MINIMOD interventions relate to enhancing the quality of the food being consumed (e.g. fortification). They have fewer of the indirect interventions that many of the others in the NMC focus on. It therefore makes sense to work together closely to exploit one another's added value.

Optima Nutrition (Nick Scott): One important theme that emerged was how to advance the agenda for activities where it's hard to quantify their cost and effect. SEEMS is really moving forward on this issue and they discussed how SEEMS could potentially be incorporated into the Optima Nutrition tool to help them answer the question: 'How do these interventions weigh up against the other things that we could be doing?' They also discussed how to get outcomes / results into a format where they are comparable to other areas of health, particularly in countries that want to know about their health benefits packages. Productivity gains and the long-term consequences of stunting were also discussed, as well as the question of how frequently data collection and analyses need to be carried out. Co-location with other tools was raised, particularly when there is potential for mixed messages when results are announced from two co-located tools. One suggestion on how to mitigate confusion (due to potentially differing results) was to draft a combined policy brief, thereby helping local stakeholders understand that they are collaborating and that results *are* consistent.

USAID Advancing Nutrition (Monica Woldt): There are different ways to ensure that our teams are *aware* of co-location. The mapping tool (matrix) seems to be an effective one; and NMC members could also text and email the group when considering or setting up in a new country. It's exciting to hear about potential collaboration between SEEMS and Optima Nutrition. There is some wonderful potential for synergies.

MAPS (Ed Joy): MAPS is still a relatively young tool, so it was useful to speak with those with more experience. The topics of gender and land tenure were raised, and how we also need to understand the *context* (e.g. farmers don't own their land) to know what's feasible before modeling various interventions. Other topics included policy cycles and when to engage with different stakeholders. It's important to enter the five-year cycle early so that there is uptake and utilization of the results when they are finally generated. Sharing networks and sharing strategies for stakeholder engagement are other benefits of being part of the NMC. It was valuable to learn that PROFILES has several stakeholder engagement strategies on their website that the group can benefit from. Finally, the question of 'where *not* to intervene', given the context of a limited budget, was discussed.

NYAS (Frances Knight): It was heartening to hear that the matrix has been valuable, and that participants want it to be updated. It would also be helpful to develop a practice (among members) of reaching out to the NMC group prior to working in a new country. This would aid in knowing who to partner with, what data is available, and what tools have already been implemented there. Another tool's results, even from a prior year, can be used to strengthen one's results or advocacy argument. The NMC could consider putting the excel matrix online, so that NMC members can access it any time; both to update it and to utilize it as a resource.

Saskia de Pee (FNG/CoTD): The conversation with MINIMOD was helpful; it was interesting to learn about their evolving methods and tools. This sparked conversations about rice fortification standards in Senegal and questions as to whether there is something MINIMOD could offer if there is good overlap and interest. With OMNI and Optima Nutrition, there was a realization that the diet intake tools are on the 'pathway' to optimal nutrition, but many of the nutrition-sensitive interventions don't have sufficient effect sizes. Given this fact, and other points discussed, it is important to share the following information with countries when working together: 1) certain tools are restrictive in terms of what interventions they can work with; 2) what a given tool can, and *can't*, do; 3) where results from one tool end and another can enter to cover gaps; and 4) how the tools can work together to cover the entire spectrum of policy questions.

Optifood (Elaine Ferguson): There is a tension between having a modeling tool that is simple enough to be used by a wide range of stakeholders, and a tool that can only be implemented by experts. The tools that were presented this morning (e.g. OMNI, GIFT, and the more basic version of MINIMOD) are all extremely simple, and they have good uptake from stakeholders. This session provided a good, focused opportunity to find ways to work together, e.g. SEEMS is doing work with an agriculture intervention that the LSHTM team is involved with. Likewise, several of the NMC members will be working in Senegal, so this was an opportunity to start conversations about collaborating.

Day One Closing Statements:

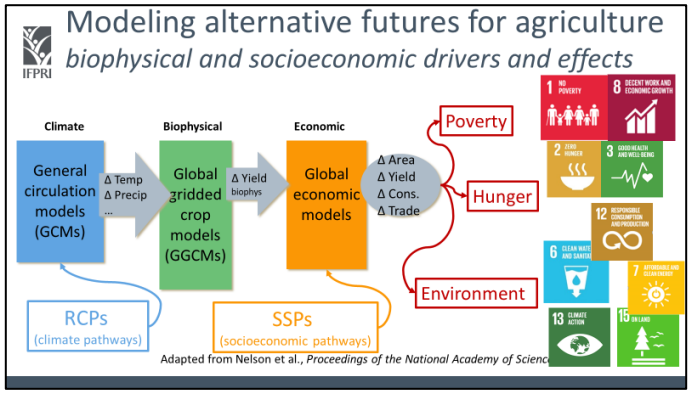
Two themes stood out from this morning's presentations of new tools, including the CONBF, BPI, MMS Cost Effectiveness, GIFT, IMMANA Gap Map and SEEMS: 1) Many of these are simple to use, thereby usable by a wide range of stakeholders; and 2) There is a variety of efforts underway to improve our access to resources, e.g. the FAO effort, IMMANA and the USAID review. Looking back over the past two years, its impressive to see how much terrain has been covered. The members of the NMC can certainly be proud of what's been achieved collectively by this group. This will be discussed further on day two, along with a conversation on how the members envision the future of the NMC.

November 1 – Day 2 Proceedings

Introducing More Modeling Tools

IFPRI / IMPACT Model: How Trading Regimes, Land Degradation and Climate Change affect LMIC's ability to Reduce Hunger

Keith Wiebe



IMPACT is a modeling framework that uses results from general circulation (climate) models as inputs to crop models and then economic models, under a range of climate and socioeconomic assumptions (see graphic at right). It was developed by IFPRI about 20 years ago and has been continually refined over time.

IMPACT relies on a variety of individual modeling tools and partners, each bringing their own tools but with a standardized approach. It's unique in that it has detailed links to water models, in addition to the climate and crop models; and has a high degree of disaggregation, both spatially and by commodities. Most modeling tools have up to 20 regions that they look at, and all look at the major cereals, etc., but most do not have the degree of commodity disaggregation that IMPACT does.

Some examples of analysis that IMPACT can conduct include (see slides in power point):

- Projected decline in share of expenditure on food as per capita GDP rises, by region
- Projected decline in share of calories from staple foods, as per capita GDP rises, by region
- Projected growth in demand for non-staple foods over time, disaggregated by fruits & vegetables; meat, dairy & eggs; and cereals
- Projected change in diet structure (cereals vs. fruits and vegetables vs. meat, dairy & eggs), by region, as countries become more developed

Climate change affects diets through multiple pathways, including crop yields and availability; nutrient quality; and food prices / access. Taking results from climate models, and running them through crop models and water models, and then economic models, can show huge variations in the types of impacts, depending on the region, commodity, which climate models were used, etc. However, under virtually all scenarios that were run, prices rise, and food consumption falls as a result of climate change. It also implies sacrifices and trade-offs that need to be made to ensure sufficient caloric intake.

IMPACT can also produce comparative analyses looking at various types of food and agriculture projections both *with* the impact of climate change and *without* its impact, as well as different interventions that can off-set its impact. Interestingly, in all regions of the world, the impact of socioeconomic drivers over the next several decades is much larger than the impact of climate change, though climate change impacts are likely to become larger *after* 2050. Policy and investment choices today can offset the impacts of climate change, but care is needed to minimize trade-offs

Questions & Answers:

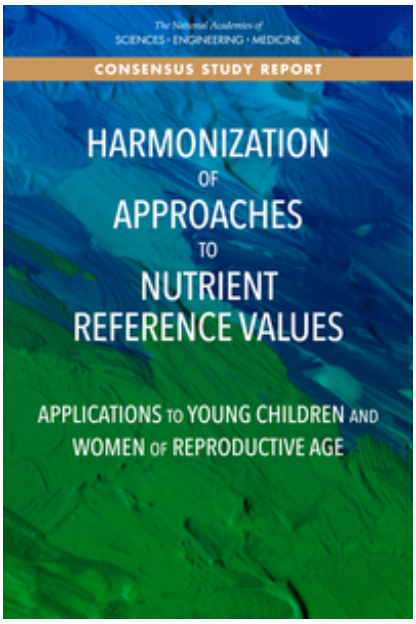
IMAPP

Lindsay Allen

Intake Modeling And Prediction Program (IMAPP) is a software program that was developed about 20 years ago for use in fortification programs to estimate the prevalence of inadequate and excessive intake of nutrients.

The current IMAPP modeling tool estimates:

- Usual intake distributions of nutrients (using the Iowa State University method) and selected foods or food groups
- Prevalence of inadequate and excessive intakes (including iron)
- Intake 'gaps', given desired target prevalence of inadequacy e.g. 15%
- Predicted changes in prevalence of inadequate and excessive intakes at different levels of fortification



To date, there has been relatively little discussion in the NMC about assessing the prevalence of inadequate or excessive nutrient intakes. This cannot be assessed without values for estimated average requirements (EARs) and upper limits (ULs); these are *missing* for most nutrients in the Institute of Medicine (IOM) and European Food Safety Authority (EFSA) recommended intakes, and absent for virtually all in the WHO/FAO recommendations. Furthermore, most NMC tools are intended for global application, so we need nutrient intake recommendations to be global too.

Next month, the Oxford University Press (*Advances in Nutrition*) will publish an article covering the proposed values for harmonized average requirements (H-ARs) and harmonized upper limits (H-ULs), for all nutrients, by age and physiological status. This was done differently from the original efforts, and now values are primarily based on EFSA, which are newer, and IOM values with added average requirements (ARs) and updated ULs. It is hoped and expected that these will be reviewed by FAO and WHO; and modified further and used. It would be useful to explore ways to link IMAPP to some of the other tools in the NMC, e.g. GIFT, MINIMOD, Optifood, etc.

The Harmonization of Approaches to Nutrient Reference Values was released in 2018 and explains the methodology for setting nutrient reference values (NRVs). The team is also working on a toolkit to help users decide whether or not to modify existing values.

Questions & Answers:

Upcoming Conferences

Learning Lab at ANH Discussion

Introduction by Edward Joy

The Agriculture, Nutrition and Health (ANH) Academy Week is an annual research conference that alternates locations annually between Africa and South Asia. The upcoming 2020 conference will be held in Lilongwe, Malawi from June 29th to July 3rd. It is a five-day long program and offers an excellent opportunity for the NMC outreach.

The ANH Academy Week is one of the work streams of the IMMANA program; it is a global research network of people working in agriculture, nutrition and / or health. They have technical and policy working groups; the SEEMS group, for example, came out of a technical working group of the ANH. They also offer online and face-to-

face seminars and training, as well as research grants and fellowships. In particular, this conference would be a good opportunity to give early-career researchers some exposure to the NMC tools, so that they can go back to their countries and apply them in their research. Unlike many other conferences, the ANH is known for bringing in practitioners and policy-makers from LMICs, perhaps because membership is free of charge. There is a nominal registration fee for conference attendance and IMMANA offers a number of travel bursaries for researchers from LMICs.

The first two days of the conference are dedicated to learning labs, which are the interactive part of the program. They are normally 1.5 hours, but it is possible to acquire two consecutive sessions (i.e. 3 hours). The learning labs must:

- be constructed around a tool or method (not a project pitch or consultation exercise)
- have specific learning outputs
- have break out work sessions
- feature tools/methods that are open access, and available to use without significant barriers
- be co-facilitated by colleagues in LMICs

The ANH is currently accepting expressions of interest for learning labs, so this NMC meeting would be a good opportunity to start putting ideas together for a proposal. A suggested format for the session would be to start with an overview of the NMC and its various tools; go into break-out groups for training on certain tools; and finally, reconvene to share learning, offering information on further training to those who are interested.

Discussion: A 'case study' approach could work well for the learning lab. The session would aim to help participants understand when the different tools can be applied in the overall planning process, perhaps using an updated version of the circular graphic / cascade (from planning to evaluation) from the early NMC meetings. There would not be sufficient time to highlight all tools in detail, but it would be an opportunity to present and discuss where they all fit.

This would be a hands-on session about looking at specific policy questions and seeing which modeling tool(s) address them, with an introductory session that helps to begin to translate their 'issue' into specific policy questions that can be answered with a tool. The types of policy questions could be divided by different tables, with participants rotating to different tables so that they have opportunities to engage on each type. This approach might be better suited to a three-hour session than attempting to provide brief training activities for a variety of tools.

It could take significant work to develop the case study in advance, but it could give participants a strong overview of the full portfolio of tools. If developing a comprehensive case study is too laborious, another approach might be to have participants 'opt-in' to the tool or part of the planning cycle that they feel is of most interest, thereby learning only about one tool / part of the policy cycle but one that is most relevant to their specific research work or experience. It should be noted, however, that the provision of full trainings for the tools represented by the NMC would not be feasible as this would usually take multiple days per tool.

A benefit of the ANH is that one week prior to the event, learning lab organizers receive a list of all individuals who have been allocated to their session, along with their email addresses. This can be useful in understanding the audience, assigning participants into groups, or potentially contacting participants in advance to help them prepare for the session.

Finally, it was noted that the Malawi Nutrition Department is planning to hold its National Nutrition Strategy dissemination conference the week prior to the ANH conference in order to make it easier for people to attend both. There is also a science and arts conference *following* the ANH conference, thus the ANH conference falls at an excellent time in terms of reaching the NMC's target audience.

Learning Center at MNF Global Conference Discussion

Introduction by Saskia Osendarp

The Micronutrient Forum 5th Global Conference 2020 will take place in Bangkok, Thailand, March 23 – 27. The program has just been finalized and will be on their website shortly. They are expecting about 1,000 participants, including some country-level delegations. There are already two sessions featuring nutrition modeling tools as part of the main program. The first is a plenary session hosted by USAID Advancing Nutrition, which looks at cost analysis and cost-benefit analysis and includes MINIMOD and other relevant tools. Secondly, there is a concurrent session moderated by Steve Vosti, with presentations from SEEMS, the MMS Cost Effectiveness tool and MINIMOD.

The conference will also feature one-hour-long learning centers that are designed for skills transfer, capacity building and in-depth discussion on specific topics. The NMC has already submitted an application for a learning center, and it appears likely that it will be accepted. The most valuable use of this session, given the time constraint and audience, might be an overview of the NMC and the various modeling tools, but the content is really open for discussion.

Discussion: If the NMC application is accepted, it would be useful to push for a Tuesday slot, since it's the first day after the core sessions. The number of attendees for the learning centers varies widely and depends heavily on how well a session is promoted. The group agreed that it would be best to focus on 'what are the tools, and how can they help you to make decisions', rather than presenting the details on specific tools. When presenting in the plenary sessions, those NMC members that are hosting or presenting could promote the learning center session on the portfolio of tools (and vice versa) and encourage the audience to see the links to other tools (and hopefully attend that later session). The learning center session could utilize an updated version of the circular graphic that was produced for the first NMC meeting and disseminate all of the other materials produced, e.g. the matrix and the case studies. It would be more 'informative' than the classic 'learning' sessions but hopefully still interactive and skill oriented.

The idea of offering more comprehensive training on the weekend following the conference (for those participants that are interested) was proposed. There might not be enough time to plan this this for the MNF conference, but perhaps it could work for the ANH conference.

As an alternative to a learning center, having an NMC booth at the conference was also proposed. The NMC members that are presenting in plenary sessions could direct people to the booth, and NMC members could take turns staffing the booth over the course of the conference. This could be a more intimate and effective way to promote the NMC and its tools. Even if the booth has to be empty some of the time, materials would be there for passers-by, and a schedule showing 'when' it would be staffed and 'by whom' could be posted. Several of the meeting participants expressed their willingness to work at the booth for one or two hours over the course of the conference. The group generally agreed that both a learning center and booth were desirable in order to communicate the NMC messages in different ways.

Looking Back and Ahead: NMC Accomplishments and Future Potential

Future Funding and Outreach Efforts

Paul Mikov

Paul is the Senior Vice President of Global Partnerships at the NYAS and has recently been working closely with Gilles to identify future funding for the Consortium. Below is an update on the two primary funding prospects:

Rockefeller Foundation: The Rockefeller Foundation recently launched their Precision in Public Health Initiative, a $100 million fund, which aims to leverage data and analytic tools to accelerate progress on the world's greatest public health challenges, beginning with reducing maternal and child deaths in LMICs. They are mostly focused at

the community level, thus some of the NMC's tools may not be as relevant. The NMC recently put together a two-page pitch document for Rockefeller highlighting the tools that align best with their goals. In response, they have referred the NMC to their Food Initiative, which has a nutrition component, and Paul is currently following up with that group.

The country of Jordan: At the end of this year, Jordan will release the results from a major, nation-wide MN survey which was led by UNICEF. Promising discussions have begun with the King's personal physician, (who manages Jordan's digital health platform), and he believes that applying some of the NMC's tools to this data set could offer Jordan's policy makers a significant opportunity for answering a wide variety of policy questions.

The MN survey contains data on iron, ferritin, vitamin D, folate, B12 and zinc status in various sub-population. They have also measured the iodine content of household salt and done under-five anthropometrics. Jordan has an interesting *variety* of sub-groups, e.g. refugee populations, obesity in some groups, etc. They also published a DHS in 2019.

The next step is to present the NMC's modeling tools to Jordan's Ministry of Health and showcase the various benefits they offer. This trip will likely take place in December or January. Furthermore, USAID-Jordan is currently in the process of reviewing applications from three major consortia in community health and will commit $25 million to nutrition programming. This convergence of opportunities is still in the exploratory stages, but it does look promising. It also represents an opportunity to 'reverse the lens', i.e. instead of going to a country offering our services, here is a case where they have new data and are seeing the value of using modeling tools to exploit the benefits of that data and in turn could request the services of particular NMC tools. It offers the opportunity to provide the 'proof of concept' that NMC members have been discussing since the first NMC meeting (i.e. of applying several tools in one country). Finally, it appears that there is very strong buy-in from the government, and they intend to revamp their nutrition policies based on analysis done with the new data set.

Discussion: It will be important to keep NMC members in the loop as the discussion with Jordan progresses, particularly from a financial point of view since the cost of conducting an analysis can vary dramatically between the different modeling tools and in some cases is very significant. Paul and Gilles will therefore need financial estimates from the individual modeling teams in order to create an overall budget for applying the tools in Jordan. It may be helpful for some of the modeling teams to participate (virtually) in these discussions with the MoH, and perhaps even conduct presentations on their tools.

It makes sense to approach both the Rockefeller Foundation and the government of Jordan as donors for both country-level work *and* global / regional work for the NMC. The Rockefeller Foundation has selected Uganda and India as their priority countries, so the Consortium should also consider pursuing funding for application in one of those countries as well.

The BMGF's nutrition section is undergoing reorganization making it currently prohibitive to make funding commitments to the NMC beyond this grant. BMGF does, however, have an excellent relationship with the Rockefeller Foundation and can lend assistance in the form of introductions if members view that as useful. At a bare minimum, the BMGF hopes to continue funding the global convening function of the NYAS, i.e. support to these meetings, given that this is a relatively small investment for the benefit that it returns.

On another front, the NYAS is about to receive funding from a European donor called the Botnar Foundation for an operations research initiative in Medellin, Colombia and Marrakesh, Morocco. This initiative will examine how the occupational status of adolescent girls determine their nutrition status and will likely use the CotD and Optifood tools as part of this research. This is an example of how the tools can be layered onto other initiatives that are receiving funding.

Given the abundance of data from various countries, another option for providing 'proof of concept' is to apply several tools to existing data sets from a given country, without actually going to that country (i.e. doing it remotely). Harvest Plus has been doing some interesting modeling, and so has Frances with CotD, Optifood and with a new tool under development, *Agrifood*, and together, they are contemplating writing a paper to add to the evidence for biofortification by showing the results from various modeling tools. Perhaps this group could do

something similar by selecting a problem and using a data set that they already have access to. One or more writers (potentially from this group) could attend a writing camp / retreat with the goal of producing a publication. This would eliminate the need to raise funding for the 'piloting' in the way that it was originally conceived. One of the challenges with this 'remote' application of the tools would be to ensure that each modeling team used the same (or similar) points of departure and underlying assumptions at the time that they applied their tool in country.

What is the Value Added of the NMC to its Members?

There are several ways to judge whether something is 'value added'. These include asking the following questions: What counter-factual do you use? What is the baseline? What would it be like if members of this group had never come together? Members voiced the following examples of 'value-added' that the Consortium offers from their perspectives:

Value added to Donors:

- From USAID's perspective, the NMC has offered an opportunity understand how the tools fit together, overlap and complement one another so that they can better assist countries in answering their policy questions. This will become even clearer as they begin working together in a single country, e.g. Jordan. Where it is discovered that gaps exist, perhaps certain tools may be modified to fill those gaps.
- From BMGF's point of view, the Consortium does indeed add significant value, though it would be helpful to acquire more objective evidence of this value in order to help to sell the idea (of continued funding) *internally* within the BMGF, and to other donors.
- The relationship between USAID and the NMC has led to a number of presentations and a webinar about the tools to USAID and its partners.

Value added for Tool Developers:

- Being a member of the NMC has made it possible for the modeling teams to learn about the many other nutrition modeling tools that exist and their respective purposes. Working together as a community has facilitated the development of documentation, presentations and graphics about this plethora of tools, and the potential and limitations of each. Clarifying the utility of each tool for one another has been incredibly useful, not just for the members themselves, but for the rest of the nutrition community as well. The documentation, presentations, and graphics produced by the Consortium advocate for the use of specific tools for specific contexts; *and* they support the mutual goal of promoting the utilization of nutrition modeling tools in LMICs more generally.
- The NMC offers value in the form of enhancing tool *development* of its member-tools. Members face similar challenges and can turn to one another for technical expertise and advice as they modify and improve their tools.
- Referring to the original objectives of the NMC, the group has made significant progress in terms of 'interoperability'. Each member is now much more capable of directing end users to a suitable modeling tool due to all of the sharing, knowledge transfer and relationship building between NMC members. In terms of 'disseminating technical information on the tools to end users', there has also been significant quantitative (website metrics, webinars attended, etc.) *and* qualitative evidence of progress that the group could collect.
- The NMC meetings have helped each of the modeling teams to recognize common challenges, e.g. having to send in technical experts to conduct the analysis and struggling to translate modeling results into policy changes. Having the NMC allows the group to discuss and strategize around these challenges, and hopefully come at them with more understanding, thoughtfulness and resources. For less experienced tools like MAPS, being part of the NMC is extremely useful as their team can learn from others that have already overcome the challenges that they are now facing. It helps the 'younger' modeling teams to avoid duplicating efforts or mistakes.
- Several participants noted that they receive many invitations to meetings and seminars each year, and that they are forced to prioritize which ones they can attend. They always come to *this* meeting, indicating how valuable it is to their organizations.

- Complementarity is not automatic; it must be carefully strategized. The 'speed-dating' exercise on day one of this meeting was spent figuring out how the two tools that were matched at each session can actually work together. An important value added of this group will be the realization of those complementarities and these meetings have served as a starting point for that process.
- In many cases, two tools will get different answers to the same questions. How the teams respond to that is important. They can either argue about who is right, or they can pick up the phone and discuss progress along the way and manage discrepancies (or better understand them) as they arise. Knowing one another through this group makes the latter option much more likely and helps the legitimacy of the tools in the eyes of policymakers. The NMC has created a community of people that feel more comfortable interacting in the context of these potentially thorny issues.
- The NMC might consider becoming a platform for leveraging donor funds for projects that they see as a priority, e.g. collaborative projects between tools or for applying a tool in a priority country. This would be a shift from only using it as an information sharing mechanism, to also utilizing it as a funding platform.

Value added for End Users:

- In one instance, where end users were confused by conflicting results (between tools), an NMC member utilized graphics developed by the Consortium to show how different tools are likely to be addressing slightly different questions, and therefore it's no surprise that it may look like they've produced conflicting results. His experience with the NMC allowed him to mediate and help resolve a discussion where two tools were seemingly in conflict.
- Prior to the forming of the NMC, the existence and purpose of these tools was unknown and / or confusing, both to end users and tool developers. Due to the knowledge sharing and relationship building, members are now more conversant on the purpose of each tool and are capable of guiding end users to one that is suitable to their specific needs.
- The NMC website offers a centralized repository of all the tools; applications and results of those tools; and other related literature. This is extremely valuable to end users and others in the nutrition community.
- Working together forces country-level decision makers to be very specific about formulating the question that they want and need answered; as opposed to being led to answer the question that a particular tool (that they happen to have been approached by) can answer for them.

Value added for the global nutrition community:

- The NMC is an *imperative* in the context of the global calls for more data, more analytics and better predictive capabilities in the humanitarian sector. Last year, the World Bank launched a famine prevention mechanism, bringing in Google, Microsoft and Amazon as the world's leading analytics experts. Ultimately, their goal is to better preposition resources for future food crises following the massive loss of lives in South Sudan. This group was very interested in the NMC when Paul Mikov presented to them and even extended an invitation for the NMC to participate in their global task force. This exemplifies how others view the NMC as performing a valuable function.
- NMC members have spent time thinking about and discussing what data is available and where the data gaps lie. Doing this as a group, across modeling tools, would not have happened had this Consortium not formed.

It was suggested that members of the Consortium continue to brainstorm individually following this meeting and send more ideas to Megan so that they can be further documented.

What would the NMC members like to focus on at future meetings?

Members had several ideas and suggestions on what to place on future agendas and where the NMC needs to re-double its efforts:

1. ***Enhancing promotion of the NMC:*** Members agreed that more needs to be done to promote the Consortium (and its member-tools), particularly to nutrition departments of various international development organizations, donors and academic institutions. Several ideas were proposed:

    - Conduct presentations or seminars for each member's own organization on the NMC and member-tools.
    - Develops a core set of power point slides that members could use for presentations as needed. Several sets of slides of different lengths could be created, e.g. a very brief (5-slide PPP) that summarizes everything, and medium and longer versions that allows presenters to adapt it to their needs, i.e. dissemination tool kit.
    - Include a link to the NMC website on each member's own website.
    - Include the NMC logo and website link on the last slide of any presentation that a member gives, in order to show that they are a member of this community of practice.
    - Include a slide that shows all the collaborators in the NMC in any presentation that a member gives on a given tool, again to promote the 'community' of member-tools.

2. ***Exploring decision making spaces / process in LMICs:*** It would be useful to have a meeting or session dedicated to the decision-making space / process at the country level. What are the trends in how governments are funding their global health and nutrition programs domestically? How many of these countries are starting to think about universal health coverage? Is sector-wide programming still driving the decision-making process? How does nutrition figure into the various sectors' packages? What do policy makers consider they need in terms of evidence to inform decision-making and how could we fill this gap?

    A meeting on this topic would help the group to better understand the policy environment and view the tools in the context of that decision-making space. Speakers on this topic could include academic experts on policy making as well as Scaling Up Nutrition (SUN) Coordinators. Perhaps Purnima Menon and David Pelletier could assist. It may be interesting to expand this discussion to include *industry* actors in addition to government, since the private sector also influences policy decisions. The more this group truly understands the policy environment in LMICs, the more opportunities they will be able to create for applying the modeling tools.

3. ***Enhancing End-User Participation:*** The original intention of this group was to include end-users as members and influencers of the NMC; and in particular, to involve them in tool development. It doesn't appear that this sub-objective has been prioritized, and moving forward, members should discuss whether including national-level end-users (as members) should remain one of the Consortium's goals. Some members articulated a desire to *enhance* end-user participation and proposed using future funding to support regional meetings, inviting end-users into those conversations. This would ensure that this group is better informed about the policy environments that it seeks to influence. It would also assist in capacity building and knowledge transfer to the country level.

4. ***Revisiting the NMC's Membership:*** The NMC membership has grown incrementally with the recruitment of several additional modeling tools / teams over the past two years. It would be helpful to discuss whether there is a desire to expand the membership even further, or whether members would instead prefer to maintain the current numbers. If the membership is to be expanded, the group will also need to discuss criteria for membership. Similarly, the initial graphic that placed member-tools on the planning cycle still includes only the original members. The group should discuss whether additional tools should be incorporated into that graphic and how.

The NYAS conference room has been booked for April 27/28 (for the next NMC meeting), but if that time period overlaps with an event in a region, then it could potentially be changed. Finally, it was noted that the ongoing interviews with end users (being conducted by Frances Knight) will likely reveal additional topics for discussion at NMC meetings.

Organizer and Participant List

Scientific Organizing Committee (SOC)

Gilles Bergeron, The New York Academy of Sciences
Megan Bourassa, The New York Academy of Sciences
Purnima Menon, International Food Policy Research Institute (participated via Web-Ex)
Lynnette Neufeld, Global Alliance for Improved Nutrition
Rahul Rawat, The Bill & Melinda Gates Foundation (Excused)
Banda Ndiaye, Nutrition International (participated via WebEx)
Saskia Osendarp, Micronutrient Forum
David Wilson, BMGF (Excused)

Participants

Katie Adams, University of California, Davis (participated via WebEx)
Saima Ahmed, The New York Academy of Sciences
Lindsay Allen, USDA, ARS Western Human Nutrition Research Center (participated via WebEx)
Ekin Birol, HarvestPlus (participated via WebEx)
Jennifer Busch-Hallen, Nutrition International (participated via WebEx)
Omar Dary, USAID (participated via WebEx)
Saskia de Pee, World Food Program
Reina Engle-Stone, University of California, Davis (participated via Web-Ex)
Elaine Ferguson, London School of Hygiene and Tropical Medicine
Rita Ferreira de Sousa, FAO (participated via WebEx)
Filomena Gomes, The New York Academy of Sciences
Edward Joy, London School of Hygiene and Tropical Medicine
Carol Levin, University of Washington
Homero Martinez, Nutrition International
Paul Mikov, The New York Academy of Sciences
Victoria Padula de Quadros, FAO (participated via WebEx)
Ellen Piwoz, The Bill & Melinda Gates Foundation
Nick Scott, Burnet Institute
Kavita Sethuraman, previously FHI 360
Thalia Sparling, IMMANA (participated via WebEx)
Andrew Thompson, Nutrition International
Roos Verstraeten, IFPRI/Transform Nutrition (participated via Web-Ex)
Steve Vosti, University of California, Davis
Neff Walker, Johns Hopkins Bloomberg School of Public Health (participated via WebEx)
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Jakub Jan Kakietek, The World Bank
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Shannon King, Johns Hopkins Bloomberg School of Public Health
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Tim Roberton, Johns Hopkins Bloomberg School of Public Health
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Christopher Sudfeld, Harvard T.H. Chan School of Public Health
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Acronyms

ANH	Agriculture, Nutrition and Health
AR	Average Requirement
BMGF	Bill and Melinda Gates Foundation
BPI	Biofortification Priority Index
COHA	Cost of Hunger in Africa
CONBF	Cost of Not Breast Feeding
CotD	Cost of the Diet
DALY	Disability-Adjusted Life Year
DHS	Demographic and Health Survey
EAR	Estimated Average Requirements
FNG	Fill the Nutrient Gap
FANTA	Food and Nutrition Technical Assistance Project
GIFT	Global Individual Food Consumption data Tool
H-AR	Harmonized Average Requirement
H-UL	Harmonized Upper Limit
HKI	Helen Keller International
IMMANA	Innovative Methods and Metrics for Agriculture Nutrition Actions
IFA	Iron and Folic Acid
IFPRI	International Food Policy Research Institute
IMPACT	International Model for Policy Analysis of Agricultural Commodities and Trade
IYCN	Infant and Young Child Nutrition
LCIRAH	London Centre for Integrative Research on Agriculture and Health
LiST	Lives Saved Tool
LMIC	Lower-To-Middle-Income Country
MINIMOD	Micronutrient Intervention Modeling Project
MMS	Multiple Micronutrient Supplementation
NYAS	New York Academy of Sciences
NMC	Nutrition Modeling Consortium
NRV	Nutrient Reference Value
OMNI	Outcome Modeling for Nutrition Impact
SEEMS	Strengthening the Economic Evaluation of Multi-Sectoral Strategies (for Nutrition)
SBCC	Social and Behavior Change Communication
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
SUN	Scaling Up Nutrition movement
ULs	Upper Limits
USAID	United States Agency for International Development
VA	Vitamin A
WV	World Vision