

# FFI/Smarter Futures meeting on Flour Fortification Monitoring and Surveillance: Process and Possibilities

4-7 March 2013, Balalaika Hotel, Sandton, South Africa

## Background:

In recent years, over 20 countries in Africa have implemented national flour fortification programs, and have grappled with the design of appropriate baseline and follow up assessments to document or track the impact of the interventions. While some countries have included a micronutrient module in their existing surveys, such as the Demographic and Health Surveys (DHS), few have been able to draw on established data systems to provide early and regular evidence on the quality, coverage and impact of micronutrient interventions. They have thus had to wait several years for evidence from impact studies to identify implementation issues and make course corrections where needed.

The Flour Fortification Initiative (FFI) and Smarter Futures identified a need to develop a monitoring and surveillance (M&S) approach which would assist countries to:

1. Assess if the maximum household coverage of fortified flour, estimated based on industry production and/or importation figures, with population level confirmation in the early stages, is reached and sustained in a given geographic area over time and
2. Answer the question, "is the health status of those who regularly consume fortified flour improving?"

FFI and Smarter Futures have therefore been working on a guide for a ***Population Based Flour Fortification Program Monitoring and Surveillance System*** (FFMSS) that aims to enable countries that have embarked on flour fortification programmes to assess trends in a limited number of program coverage and micronutrient status indicators in "easy-to-reach" target populations. The purpose of the document is to provide guidance on the development of a feasible and sustainable M&S system to track the trends in the household coverage of quality fortified flour and foods such as bread made from fortified flour, and in the health status of non-pregnant women of childbearing age over time, focusing on anemia, iron and folate status and the birth prevalence of neural tube defects. The guide should help in designing a feasible and on-going system to guide fine-tuning of programmes, to document the trends in impact indicators in populations consuming adequately fortified flour in sufficient quantities, and to determine when a full impact survey is appropriate.

The draft of the guide, principally authored by Ibrahim (Abe) Parvanta, was reviewed at a meeting in Dar es Salaam in April 2011<sup>1</sup>, where country participants and international experts provided inputs. A further meeting was convened in Sandton, South Africa, to review a near-final draft of the guide, and to provide guidance on how it could be applied in

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<sup>1</sup> For a report on the Dar es Salaam meeting, see <http://www.ffinetwork.org/about/calendar/2011/QAOCMSTanzania.html>

the field.

## **Objective of the Meeting**

The overall objective of the meeting was to finalize the guide for a *Population Based Flour Fortification Program Monitoring and Surveillance System* (FFMSS), to finalize a protocol to field test it, and to select possible locations for the field-test.

## **Expected Outputs**

1. A final or near-final draft of the guide for a *Population Based Flour Fortification Program Monitoring and Surveillance System* (FFMSS).
2. A final or near to final field-testing protocol for the FFMSS.
3. Agreement on 1 or possibly 2 countries where the FFMSS could be field tested beginning in 2013.

## **Participants**

With the assistance of partner agencies in Africa, including the Global Alliance for Improved Nutrition (GAIN), Helen Keller International (HKI), Micronutrient Initiative (MI), UNICEF, and the Regional Office for Africa of the World Health Organisation (WHO/AFRO), scientists, programme managers and monitoring and surveillance specialists from different parts of Africa were selected to participate in the meeting. The remarkably enthusiastic, hard-working and knowledgeable group of participants came from Burkina Faso, Cameroon, Ethiopia, Ghana, Mozambique, Tanzania, Nigeria, South Africa, and Uganda<sup>2</sup>.

## **Meeting overview and key issues discussed**

The meeting started with introductory presentations and plenary discussions on the background and content of the draft guide. Anna Verster reminded the group that at a global level, mandatory wheat flour fortification has increased from 33 countries to 75 countries in just 10 years, and that effective monitoring and surveillance systems are urgently required to help safeguard the effective implementation of these programmes<sup>3</sup>. Many countries started fortification without strong baseline data, and with sub-optimal fortificant content, and have experienced challenges with compliance. When these programmes were assessed, they showed little impact on health status, due to implementation problems that could have been identified earlier if strong M&S systems had been in place.

The guide is thus being developed in response to the need for regular information on trends in coverage and impact of a programme, particularly, but not exclusively in the initial stages, so that there is rapid feedback that enables programmes to be adjusted for

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<sup>2</sup> The participant list can be accessed here:

<http://www.ffinetwork.org/about/calendar/2013/documents/FORTIMASparticipants.pdf>

<sup>3</sup> Verster's presentation can be accessed here:

<http://www.ffinetwork.org/about/calendar/2013/documents/FORTIMASbackground.pdf>

greater impact. **The key purpose is to track *trends* in the effectiveness of a flour fortification program over time in populations documented to consume quality fortified flour and its products on a regular basis – not necessarily to provide statistically representative estimates of the prevalence or incidence of micronutrient deficiencies in the population at a point in time.** For the latter, a representative survey is needed. Based on the WHO/FAO Monitoring framework<sup>4</sup>, the guide focuses on population-based monitoring, and builds on other existing tools, particularly those used for product quality monitoring. It also follows the WHO recommendations on wheat and maize flour fortification.<sup>5</sup>

Abe Parvanta set the scene for the group work which was to follow during the next few days<sup>6</sup>. He provided an overview of the minimum conditions needed for successful flour fortification programmes and explained the complementary nature of food industry and regulatory monitoring on the one hand, which should provide data on the quality of the fortified product and its expected population coverage; and public health monitoring and surveillance on the other, which provide information about actual coverage and health impacts. Together, these processes make up a comprehensive monitoring and surveillance system. He stressed that surveillance of impact on health/nutritional status is only useful once it is established that coverage (in a particular geographic area) of adequately fortified flour has reached about 80%.

The presentation also highlighted the different uses of sentinel site data collection and randomized population-based surveys. In countries where data on micronutrient intakes and micronutrient status are not regularly collected in population surveys, regular sentinel site data collection can be used. A sentinel site approach uses convenience sampling at data collection points such as clinics, workplaces, places of worship and schools, in selected communities, to regularly collect data on the population's use of fortified flour/flour-based staple foods and relevant health outcomes. The data from sentinel sites and collection points should provide a reflection of trends over time in population coverage and health/nutritional outcomes. Periodic (every 5 or 10 years) population-based surveys are used to establish changes in health status and confirm the trends identified through the surveillance system.

Helena Pachón shared findings from an initial overview of the public health evidence on the impact of flour fortification on serum folate, neural tube defects, serum ferritin, and haemoglobin<sup>7</sup>. Using findings from effectiveness trials conducted before and after fortification programmes were initiated, the presentation indicated that 18 of 19 subgroups analyzed for impact on serum folate demonstrated increased folate levels after folic-acid fortification began; 19 of 20 subgroups showed decreased neural tube defects

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<sup>4</sup> See: [http://www.who.int/nutrition/publications/micronutrients/guide\\_food\\_fortification\\_micronutrients.pdf](http://www.who.int/nutrition/publications/micronutrients/guide_food_fortification_micronutrients.pdf)

<sup>5</sup> See: [http://www.who.int/nutrition/publications/micronutrients/wheat\\_maize\\_fortification/en/](http://www.who.int/nutrition/publications/micronutrients/wheat_maize_fortification/en/)

<sup>6</sup> Parvanta's presentation can be accessed here:

<http://www.ffinetwork.org/about/calendar/2013/documents/FORTIMASooverview.pdf>

<sup>7</sup> Pachón's presentation can be accessed here:

<http://www.ffinetwork.org/about/calendar/2013/documents/HealthImpact.pdf>

after initiation of folic-acid fortification; and increased serum ferritin levels were found in 9 of 11 subgroups after commencement of iron fortification. In contrast, impact on haemoglobin was detected in only 11 of 23 subgroups after fortification began with one or multiple nutrients. Based on these findings, effectiveness studies of wheat and flour fortification programmes demonstrate that folic-acid fortification increases serum folate levels and decreases the risk of neural tube defects, and iron fortification increases serum ferritin levels. In populations where factors in addition to iron deficiency substantially influence haemoglobin levels, assessments of the impact of flour fortification with iron and/or other nutrients based on haemoglobin alone may not readily detect changes.

Quentin Johnson and Philip Randall introduced recent developments regarding tools and tests for quality assurance and quality control (QA/QC). Quentin provided an overview of the rationale for QA/QC and reviewed examples of basic and enhanced quality systems that are available and in use in different operations at the mill level<sup>8</sup>. He reminded participants of the available guidance document<sup>9</sup> for good practice at the mill level. A lot of excitement was generated by Philip Randall's presentation of a very easy modification of the iron-spot test to be able to assess if NaFeEDTA is present (something not possible with the current iron spot test). It involves not adding hydrogen peroxide to the sample. In later presentations it was stressed that the revised method should now be documented and official AACC (American Association of Cereal Chemists) status modification obtained. Developing i-Check technology for rapid measurement of micronutrients in foods & use for NaFeEDTA-fortified flours should be a priority.

Using a simple flow diagramme (see Figure 1), participants discussed progress (and bottlenecks) in country flour fortification programmes, and reviewed how they could use the guide to implement practical monitoring and surveillance systems in four group work sessions.

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<sup>8</sup> Johnson's presentation can be accessed here:  
<http://www.ffinetwork.org/about/calendar/2013/documents/QAQCupdate.pdf>

<sup>9</sup> See: <http://www.ffinetwork.org/implement/toolkit.html>

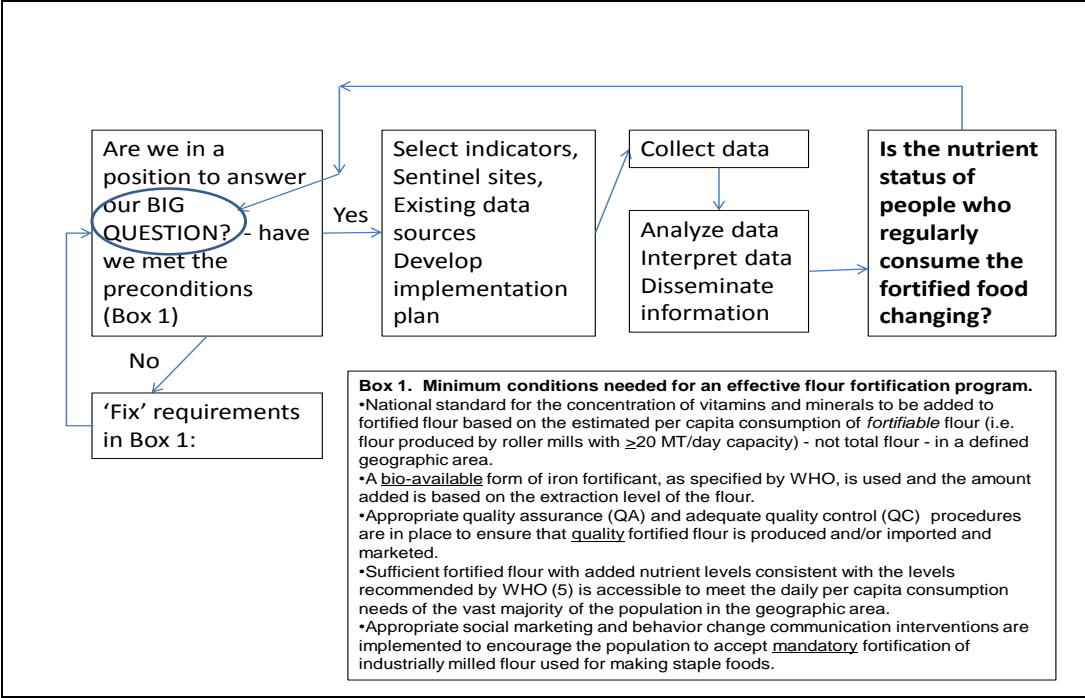


Figure 1: Flow diagramme for developing a surveillance plan:

The initial intent was that groups would consider how the guide might be field tested in a hypothetical country, “*Fortifitopia*”. However, it became clear that country situations varied a great deal, that several countries were poised to develop monitoring and surveillance systems, and that countries had existing surveillance systems and surveys that could be adapted to track trends in population coverage of the fortified flour program and related health status. The group work provided an opportunity for participants to use (and explore the usefulness of) the guide to assess country readiness to implement population-based monitoring (i.e. are there geographically defined areas with sufficient coverage with and regular consumption of adequately fortified food). They also discussed minimum indicators needed to track trends in coverage, consumption and impact, and tested specific tools in the guide (for estimating coverage, and process planning). Plenary discussions of the group work provided useful inputs to strengthen the guide, and to support advocacy for, and design and implementation of locally-appropriate systems.

Country participants identified a number of potential sources of data and existing programmes from which information on fortification could be extracted. For example, in Nigeria, Central Bank information on all importation transactions could be used to estimate quantity of imported wheat flour; and the Nigerian bakers association could provide information on wheat flour coverage. In South Africa, Neural Tube Defects (NTD) reporting may be integrated into the existing district-level health information system and in Ethiopia, additional data collection (if needed) could be added to the existing system of 90 HIV sentinel sites.

Concluding sessions covered technical issues raised during the meeting<sup>10</sup>, and an overview of changes proposed to the guide. Among the key recommendations for adjustments to the guide included

- Recommend taking advantage of existing data (collected by multiple sectors) and data-collection systems to collate fortification coverage and impact information on a regular basis.
- Propose including primary data collection only if the above condition is not met. (One example that can be added is "shelf length" or "facing" surveys which are basically about going to supermarkets (where these are an important source of flour for consumers) and counting the amount of shelf space dedicated to fortified versus non-fortified flour).
- Reconcile the use of the "sentinel site" terminology in cases where existing data will be used, in those where primary data collection will occur, and in those where there is a combination of the two.
- With the use of existing data, add an example of what triangulation of information from different sources can look like.
- Add a decision-tree to walk users through the steps in the guide. For example, the "going backwards" framework that guided group work 2-4.
- Briefly discuss how the M&S guide can be used for other fortified foods.
- Describe how the M&S can be integrated into existing programs and their M&E systems.
- Add to the list of sample indicators, non-biological indicators of impact such as increase in nutrient intake post fortification that can be assessed through dietary (or comparable) surveys such as DHS food frequency methodology or HIES consumption methodology.
- Include guidelines on how to account for the contribution of other programs to the health outcomes on which fortification has an impact. If these programs existed prior to fortification and they have not been substantially ramped up during the same time period that fortification is implemented, any improvements could be attributable to fortification. If these assumptions do not hold, then one cannot attribute improvements solely to fortification.
- Add a section on the strengths and weaknesses of the M&S approach.

A competition to propose an alternative name for the proposed system ran throughout the meeting, and participants proposed more than 20 names. In a final vote, one clear winner emerged, and the name FORTIMAS (Fortification Monitoring and Surveillance) was enthusiastically embraced.

## **Conclusions and next steps**

Participants agreed that a sentinel site system was attractive because it enabled early and regular data collection from areas with high coverage. Tracking trends in between national surveys allows the country to see how the fortification program is progressing and where

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<sup>10</sup> The summary presentation by Johnson can be accessed here:  
<http://www.ffinetwork.org/about/calendar/2013/documents/TechnicalIssues.pdf>

bottlenecks need to be addressed. It emerged that there were many data collection systems and data sources available in countries for triangulation of trend data on coverage and impact of flour fortification, making primary data collection unnecessary in these cases.

There was a strong sense that participants took ownership of the FORTIMAS guide, and were happy to be regarded as contributors to the guide. Having been thoroughly discussed in two meetings (Dar es Salaam, and Sandton), it can now be seen as a joint effort of participants from African countries and agency representatives. It is a 'living document' that will continue to grow as country experience and case studies enrich our understanding of the challenges and advantages of surveillance. Rather than a blueprint, the document is a guide from which country teams can draw technical guidance and helpful lessons that they can consider as they develop their own systems. Suggestions from the meeting will be incorporated into a revised draft by the end of April 2013. After review by meeting participants it will become available for field application and roll out in countries. HKI will support the translation of the guide into French, and help to start field application and roll-out in countries.

FFI/Smarter Futures will consider how country and regional training vis-à-vis FORTIMAS can be accommodated in their work plans for the next two years.

To start the field application and roll out of the FORTIMAS system, it was recognized that National Fortification Alliances needed to be fully on board, and that countries would need a dedicated group / committee to develop an implementation plan. Recognizing that the surveillance process could provide an impetus to revitalize NFAs (that often become less active once fortification is implemented), country participants committed themselves to sharing insights from the meeting with their colleagues in these bodies, and to begin to lay the groundwork for the development of locally-appropriate surveillance systems.

It is likely that countries would want to start with pilot projects before rolling out the surveillance system to multiple sentinel sites. FFI/Smarter Futures could provide technical assistance as needed. In West Africa, regional training seems a feasible approach while country-specific training is likely to be more effective in Southern and Eastern Africa, given the different conditions in countries.

There is a clear need to further strengthen the guide with the development of rapid qualitative and quantitative test kits for assessing the quality of fortified flour so that robust and sustainable monitoring and surveillance systems can become the norm in flour fortification programmes across the continent.

The meeting evaluation indicated that participants found it highly relevant to their work and that the presentations and group work were very useful. Participants noted the need to continue giving attention to technical aspects of fortification, given that many programmes are still in the early stages, while also extending this type of engagement on monitoring and surveillance to country level.