Monitoring, surveillance and evaluation of a food fortification program

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with thanks to Ibrahim Parvanta
POPULATION LEVEL MONITORING, SURVEILLANCE & EVALUATION “below the dotted line”

Adapted from WHO/FAO. Guidelines on food fortification with micronutrients. Geneva, Switzerland 2006
Important preconditions before moving “below the dotted line”
Ensure that:

• Good estimate is available on average per capita intake of *fortifiable* flour (i.e. flour produced in roller mills with $\geq 20$ MT/day capacity) - not total flour - in a defined geographic area.
  – Essential for determining the standard for concentration of vitamins and minerals to be added to fortified flour.

• With regard to iron fortification, a *bio-available* form of fortificant (sodium iron EDTA, ferrous sulfate, ferrous fumerate, or electrolytic iron) must be used based on WHO guidelines and dependent on extraction level.
Ensure that:

• Good QA/QC procedures are in place at the flour mills, along with regulatory inspections and enforcement by the food control and/or customs agencies to ensure that quality (adequately) fortified flour is marketed.

• Sufficient fortified flour containing fortificant levels consistent with WHO guidance is accessible to meet the daily per capita intake needs of the vast majority of the population in a given geographic area.

• Good awareness has been created to encourage consumers to accept mandatory fortification of industrially milled flour.
FLOUR COVERAGE IN FORTIFITOPIA

- Capital
- Big City A
- Big City B

= fortified flour on market

SEA
Regular and transparent collaboration between public health sector, food and/or customs control, and flour industry (millers and importers) is critical for effectiveness of flour fortification and its successful monitoring, surveillance and evaluation.
Flour Fortification Monitoring vs. Surveillance vs. Evaluation
Flour Fortification Program Monitoring

• The ongoing and systematic collection and analysis of data and interpretation and use of the resulting trend information on program inputs, implemented activities, and outputs to assess how a flour fortification program is performing compared to predefined criteria.

  – QAQC or regulatory monitoring is an essential part of programme monitoring
  – tracking the quantity and sufficient population coverage of adequately fortified flour serves as output indicator
Flour Fortification Surveillance

• The ongoing and systematic collection, analysis, and interpretation of *data* and dissemination of the *trend information* on micronutrient and health *status* of a population with regular access to fortified flour, to help strengthen and sustain a flour fortification program as *impact* indicators.

  – iron and folate nutrition and NTD incidence are *impact* indicators.
Flour Fortification Programme Evaluation

• Is the systematic collection and analysis of data and information about the activities, characteristics, and impact of the flour fortification program to assess (and improve) its effectiveness and inform decisions about its continuation or expansion.
  – Surveillance data and information informs program evaluation.
  – Additional data (quantitative and/or qualitative) may need to be collected; e.g. a population-based statistical survey.
  – May be conducted every 5 – 10 years.
  – Most public nutrition programs are evaluated at adequacy level – i.e. the preponderance of evidence indicates that the program has (or has not) helped improve nutritional status of the population.
Often used M&E model for a Flour Fortification Programme

- QAQC in place in the mills
- Start of mandatory flour fortification
- Regulatory staff trained and regulatory monitoring operational
- Time ~ 5-10 yrs.
“Formula” to Describe Public Health Success of an Effective Flour Fortification Programme

A
Quality Fortified Flour/Flour Products Produced or Imported

B
High (>80%) Population Coverage

C
Sustained Coverage Over Time

D
Impact on Micronutrient Status

Industry and food Control based component

Population based component

On-going data collection and information reporting
Flour fortification must be continued indefinitely to achieve maximum sustained impact on the nutritional and health status of the population.

Declining trends in anemia prevalence in low-income children <5 years old in five states in the United States.

Trends in the incidence of spina bifida and other birth defects in Oman.


Source: Personal communication; Ms. Deena Alasfoor, Oman Director of Nutrition
FORTIMAS, a monitoring and surveillance tool

- A tool to help you to track trends in the effectiveness of a flour fortification programme over time in populations documented to regularly consume fortified flour.

- Not a tool to provide statistically representative estimates of the prevalence or incidence of micronutrient deficiencies in the population at a point in time.
FORTIMAS answers the 1\textsuperscript{st} Question

- Is micronutrient status \textbf{improving} among people in the country that regularly consume quality fortified flour (foods)?

- What is the micronutrient status of the population of the country?
FORTIMAS uses Sentinel Data Collection and Purposive and Convenience Sampling Approaches
• “Sentinel” refers to “watching over”.
• Sentinel data collection involves purposively selecting a few communities within a larger geographic area (expected to have high population coverage) as sentinel data collection sites such that:
  – Data trends from the sites are expected to reflect (mirror) trends in household coverage and impact of flour fortification in the broader geographic area.
• Existing health clinics, schools, worksites, houses of worship, etc. within each sentinel site could serve as data collection points.

Once FORTIMAS documents the desired trends in population and impact, more detailed assessment and evaluation of the flour fortification program could be performed.
SENTINEL SITES IN FORTIFITOPIA

- Big City B
- Big City A
- Capital

- = fortified flour on market
- = FORTIMAS Sentinel site

SEA
FORTIMAS uses different data sources to triangulate the info from each to create a more complete picture.
Flour industry & Food Control Agency data

1. Millers and importers – amount of fortified flour produced and imported.
2. Food Control Agency – quantity of fortified flour which meets quality standards

Population-level data

1. Women's awareness of fortified flour.
2. Women's reported purchases of fortified flour/staple foods.
3. Anemia, iron deficiency & folate sufficiency prevalence in non-pregnant women.

Health Clinics

1. Anemia prevalence in 1st trimester pregnant women.
2. Anemia, iron deficiency & folate sufficiency prevalence in adolescent school girls.
3. NTD incidence among maternity facility births

Schools, wholesalers, bakeries, supermarkets

Secondary schools, maternity hospitals/birth centers
Hypothetical FORTIMAS System for Flour Fortification

80% coverage threshold

QA/QC system in place in the mills

Monitoring “Expected” Population Coverage

Initial impact detected

Annual Impact Surveillance

Impact evaluation surveys done after M&S system documents the expected population coverage and impact trends

Pre-flour fortification nutrient deficiency survey

Start of mandatory flour fortification and M&S system

Regulatory staff trained and QC monitoring activities operational

TIME ~ 5-10 yrs.

- Micronutrient deficiency prevalence … often based on representative population survey
- FORTIMAS system - Micronutrient deficiency indicator prevalence
- FORTIMAS system - % “expected” population coverage based on industry data; ≥80% household coverage also confirmed through sentinel site monitoring

~1 year periods with ≥80% household/population coverage of fortified flour
• You can access FORTIMAS on-line at www.smarterfutures.net/FORTIMAS
• The webpage gives guidance on how to use FORTIMAS
• You can download the entire document or download specific chapters
• You can download and use the interactive data sheets
• You can link to the WHO/CDC/ICBD tool for NCD surveillance
• Feel free to print copies!
• For more information: info@smarterfutures.net
FORTIMAS: An Approach for Tracking the Population Coverage and Impact of a Flour Fortification Program

How to use FORTIMAS?

The primary aim of the guide is to propose a population-level data collection approach to help answer the question, “is the micronutrient status of those who regularly consume sufficient quality fortified flour improving?”. During the planning stages of FORTIMAS, it may be useful to “work backwards” from the ultimate aim and review the issues that need to be addressed to achieve it. Flow Diagram 1 (see below) illustrates this approach. Also, keep in mind that Box 1 (see below) lists the essential preconditions for an effective flour fortification program that must be met before embarking on collecting primary data or using existing data to track the population coverage and impact of the intervention.