

# ***Monitoring Framework for Micronutrient Interventions***

## **Vitamin A – Supplementation**

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<b>Is the <u>intervention</u> functioning adequately?</b>	Are supplementation protocols (preventive and treatment) in place and applied correctly?	Protocol procedures; Percentage of distribution and selling facilities applying protocol are correct (timing and dose)	Site visit, interviews with staff, distributing facility survey, review protocol.	Ministry of Health (MoH)	Ongoing, initial year; then every 2-years
	Is the supplement available in sufficient quantity: in the country and at distribution and selling facilities?	Distribution and selling facilities are receiving adequate supplement supply regularly and in time	Import records, MoH distribution records, stock and sales records, survey in distributing, selling facilities	MoH	Semi-annual
	Is the quality of training/instructions to distributing staff on supplementation protocol adequate?	Distribution staff has adequate knowledge of supplementation protocol	Interviews, phased survey, site visits	MoH, health communication expert	Initially semi-annual; then every 2–3 years
	Is the communication of messages by distributing staff to the target population adequate?	Distributing staff provides correct instructions on supplementation to target population	Interviews, phased survey, (household) survey, site visits, observe service delivery	MoH, health communication expert	Initially semi-annual; then every 2–3 years
	Is the quality and effectiveness of communication activities adequate?	Appropriateness of messages, materials and media; Target population has adequate knowledge on supplement use and its purpose	Interviews, phased (household) survey, focus group, site visits; review health communication plan	MoH, health communication expert	Initially semi-annual; then every 2–3 years

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<b>Is the intervention available, affordable, and acceptable to the target population?</b>	Is the supplement available to the target population at distribution and selling facilities?	Target population has access to the supplements	MoH distribution records, sales records, survey in distributing, selling facilities, health cards (household survey)	MoH	Semi-annual
	Is the supplement affordable for the target population?	Price of supplement, average income, perception of population	Market survey, price of supplement, focus groups	MoH, Ministry of Commerce	Annual
	Is the supplement acceptable to the target population?	Perception of vit A supplements among target population (1) know about it?; (2) beneficial, indifferent, harmful, other...	Focus group, phased (household) survey	MoH	Initially first year; then every 2–3 years
<b>Is the intervention being used by the target population? (Coverage)</b>	Does the target population take the supplements in scheduled frequency and dose?	Proportion of target population receiving supplements in correct dose and frequency, by region	Phased (household) survey Immunization/health cards, clinic records	MoH	Every 2–3 years

## Vitamin A – Fortification

	Question	Indicator	Data Collection Method	Who collects	Frequency of collection
<b>Is the intervention functioning adequately?</b>	Is fortified food available in sufficient quantity?	Amount fortified food produced/imported/exported and distributed within the country	Reports (Industry production records, sales data; Import/export records)	Fortified food companies (producers, importers, distributors); MoH, MoAgr	Beginning and end of each harvest season
		Amount of fortificant imported	Routine reporting from customs and fortification producer	Fortified food companies, MoH	Before and during harvest season
	Is the quality and effectiveness of communication activities adequate?	Appropriateness of messages; materials and media; percentage of target population with adequate knowledge on importance of fortification and its purpose	Interviews, phased (household) survey, focus group, site visits; review health communication plan and materials	MoH, Universities, media, health communication expert	Initially semi-annual; then every 2–3 years
<i>Factory level -Internal monitoring-</i>	Is food fortified, labeled and packaged according to determined standards?	Fortified food samples/batches comply to national standards (within set range or above minimum level mg/Kg)	Food analysis results, QC charts, reports, inspection forms	Fortified food companies	Continuous (each batch)
		QA and QC procedures for fortified food are in place	Factory procedures manuals, QC and LQAS records, production records	Fortified food companies	Ongoing during harvest (even months)
		Labeling, packaging, and storage procedures and conditions are followed	Factory procedures manuals and reports	Fortified food companies	Annual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<i>Factory level -External monitoring-</i>	Is food fortified, labeled, and packaged according to determined standards?	Fortified food samples/batches comply to national standards (within set range or above minimum level mg/Kg)	Random food samples for analysis (factory & gov. analysis reports, fortification purchase)	MoH, food inspectors	1–6 monthly (depending on gov. capacity and experience with company)
		QA and QC procedures for fortified food are in place	Inspection visit (QA/QC plan & reports)	MoH, food inspectors	Annual
		Labeling, packaging, and storage procedures and conditions are followed	Inspection visit, factory procedures manual	MoH, food inspectors	6–12 monthly (or once during harvest season)
<i>Wholesale and retail level =&gt; needed when vit.A content of food at household level does not meet standards and there is NO problem with fortification at production level</i>	Is food fortified, packaged, stored, and transported according determined standards?	Stability of vitamin A in food. Packaging/repackaging materials used. Storage and transport facilities and procedures (First In First Out). Turn over time of fortified food (time between production and consumption) Fortified food samples/batches comply with national standards for vitamin A concentration at retail level	Market surveys and investigation of food samples, packaging and storage conditions of major wholesalers/ retail outlets in the country	Food companies, MoH	When needed
<i>Household level</i>	Is the food fortified and at what level?	Fortified food samples/batches comply to national standards at consumption level (within set range or above minimum level mg/Kg)	School or household survey; piggy back with other survey; surveillance (e.g., phased survey)	MoH	Periodic (1st year; then every 2-3 years), ongoing
<b>Is the intervention available, affordable and acceptable to the target population?</b>	Is vitamin A fortified food available to the target population: at sales point?	Number of target population having access to vitamin A fortified food	Situation analysis, sales records by geographic distribution, market survey, household survey	Fortified food industry, MoH	Semiannually or annually
	Is vitamin A fortified food affordable for the target population?	Price of fortified food as compared to non-fortified food	Market survey, price of fortified food	MoH, fortified food industry, MoCommerce	Annual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
	Is vitamin A fortified food acceptable to the target population?	Perception of vitamin A fortified food among target population (1) know about it? (2) beneficial, indifferent, harmful, other...	Focus group, phased (household) survey	MoH	Initially first year; then every 2–3 years
<b>Is the intervention being used by the target population?</b> <i>(Coverage)</i>	What percentage of the target population consumes fortified food regularly (by region/age group)	Target population consuming fortified food regularly (number of times per week) Impression on level of consumption (e.g., Percentage of families with children <5 and/or postpartum women regularly consuming (3/wk) sufficient amounts of fortified food)	Household survey Dietary assessment food frequency and focus group	MoH, university	at baseline and every 2 years

### **Vitamin A - Impact**

	<b>Question</b>	<b>Indicator</b>	<b>Population group</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<b>How has the micronutrient status improved in the population?</b>	How has the vitamin A status improved in the target population?	Clinical: eye signs, night blindness  Biochemical: serum retinol, Retinol Binding Protein (RBP), retinyl esters in breastmilk  <u>Indicators of infection</u> (to assess the effect of infection on biochemical indicators of vitamin A status):	Night blindness: pregnant women, children 24–71 months  Serum retinol and RBP: infants and children 6–71 months  Breastmilk retinol: lactating mothers	Household surveys Mini surveys Clinic based data Surveillance	MoH	At baseline and after 4 or 5 years Routine monitoring (sentinel site survey) Ongoing (surveillance)

	<b>Question</b>	<b>Indicator</b>	<b>Population group</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
		α1-acid glycoprotein (AGP), C-reactive protein (CRP)				

## Iron – Supplementation

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<b>Is the intervention functioning adequately?</b>	Are supplementation protocols (treatment, prevention; universal, targeted; daily, weekly) in place and applied correctly?	Protocol procedures; Distribution and selling facilities are applying protocol correctly (timing and dose)	Site visit, interviews with staff, distributing facility survey, review protocol.	MoH	On-going, initial year, then every 2 years
	Is the supplement available in sufficient quantity? — the country and at distributing, selling facilities?	Imported as percentage; Distribution and selling facilities are receiving adequate supplement supply regularly and in time	Import records, MoH distribution records, stock and sales records, survey in distributing, selling facilities	MoH	Semiannual
	Is the quality of training/instructions to distributing staff on supplementation protocol adequate?	Distribution staff has adequate knowledge of supplementation protocol	Interviews, phased survey, site visits	MoH, health communication expert	Initially semi-annual; then every 2–3 years
	Is the communication of messages by distributing staff to the target population adequate?	Distribution staff provides correct instructions on supplementation to target population	Interviews, phased survey, household survey, site visits, observation of service delivery	MoH, health communication expert	Initially semi-annual; then every 2–3 years
	Is the quality and effectiveness of communication activities adequate?	Appropriateness of messages, materials and media; Target population has adequate knowledge on supplement use and its purpose	Interviews, phased (household) survey, focus group, site visits; review health communication plan	MoH, health communication expert	Initially semi-annual; then every 2–3 years
<b>Is the intervention available, affordable and acceptable to the target population?</b>	Is the supplement available to the target population: at distributing and selling facilities?	Target population has access to the supplements	MoH distribution records, sales records, survey in distributing, selling facilities, health cards, (household survey)	MoH	Semiannual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
	Is the supplement affordable for the target population?	Price of supplement, average income, perception of population	Market survey, price of supplement, focus groups	MoH, MoCommerce	Annual
	Is the supplement acceptable to the target population?	Perception of iron supplements among target population: beneficial, indifferent, harmful, other...	Focus group, phased (household) survey	MoH	Initially first year; then every 2–3 years
	Do people accept preventive (as opposed to curative) iron supplementation?	Perception among target population	Focus group, phased (household) survey	MoH	Initially first year; then every 2–3 years
<b>Is the intervention being used by the target population? (Coverage)</b>	Does the target population take the supplements in scheduled frequency and dose?	Proportion of target population receiving supplements in correct dose and frequency, by region	Phased (household) survey Immunization/health cards, clinic records	MoH	Every 2–3 years

## Iron – Fortification

	Question	Indicator	Data Collection Method	Who collects	Frequency of collection
<b>Is the intervention functioning adequately?</b>	Is fortified food available in sufficient quantity?	Amount of fortified food produced/imported/exported and distributed within the country	Reports (Industry production records, sales data; Import/export records)	Fortified food companies (producers, importers, distributors); MoCommerce	Ongoing
		Amount of fortified food produced/imported/exported and distributed within the country	Routine reporting from customs and fortificant producer	Fortified food companies, MoH	Every 6–12 months
	Is the quality and effectiveness of communication activities adequate?	Appropriateness of messages; materials and media; Target population has adequate knowledge on importance of fortification and its purpose	Interviews, phased (household) survey, focus group, site visits; review health communication plan and materials	MoH, universities, media, health communication expert	Initially semi-annual; then every 2–3 years
<i>Factory level -Internal monitoring-</i>	Is food fortified, labeled and packaged according to determined standards?	Fortified food samples/batches comply to national standards (within set range or above minimum level mg/Kg)	Food analysis results, QC charts, reports, inspection forms	Fortified food companies	Continuous (each batch)
		QA and QC procedures for fortified food are followed	Factory procedures manuals, QC and LQAS records, production records	Fortified food companies	Ongoing; then every 3 months
		Labeling, packaging, and storage procedures and conditions are followed	Factory procedures manuals and reports	Fortified food companies	Annual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<i>Factory level -External monitoring-</i>	Is food fortified, labeled and packaged according to determined standards?	Fortified food samples/batches comply to national standards (within set range or above minimum level mg/Kg)	Random food samples for analysis (factory and gov. analysis reports, fortification purchase)	MoH, food inspectors	1–6 monthly (depending on gov. capacity and experience with company)
		QA and QC procedures for fortified food are followed	Inspection visit (QA/QC plan & reports)	MoH, food inspectors	Annual
		Labeling, packaging and storage procedures and conditions are followed	Inspection visit, factory procedures manual	MoH, food inspectors	Every 6–12 months
<i>Wholesale and retail level =&gt; needed when iron content of food at household level does not meet standards and there is NO problem with fortification at production level</i>	Is food fortified, packaged, stored and transported according determined standards?	Stability of iron in food. Packaging/repackaging materials used. Storage and transport facilities and procedures (First In First Out). Turn over time of fortified food (time between production and consumption) Fortified food samples/batches comply with national standards for vitamin A concentration at retail level	Market surveys and investigation of food samples, packaging and storage conditions of major wholesalers/ retail outlets in the country	Food companies, MoH	When needed
<i>Household level</i>	Is the food fortified and at what level?	Fortified food samples/batches comply to national standards at consumption level (within set range or above minimum level mg/Kg)	School or household survey; piggy back with other survey; surveillance (e.g., phased survey)	MoH	Periodic (1st year, then 2–3 yearly), ongoing
<b>Is the intervention available, affordable and acceptable to the target population?</b>	Is iron fortified food available to the target population: at sales point?	Target population has access to iron fortified food	Situation analysis, sales records by geographic distribution, market survey, household survey	Fortified food industry, MoH	Semiannually or annualy
	Is iron fortified food affordable for the target population?	Price of fortified food as compared to non-fortified food	Market survey, price of fortified food	MoH, fortified food industry, MoCommerce	Annual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
	Is iron fortified food acceptable to the target population?	Perception of iron fortified food among target population (1) know about it? (2) beneficial, indifferent, harmful, other...	Focus group, phased (household) survey	MoH	Initially first year; then every 2–3 years
<b>Is the intervention being <u>used</u> by the target population?</b>  <b><i>(Coverage)</i></b>	What percentage of the target population consumes fortified food regularly (by region/age group)	Target population consuming fortified food regularly (X times per week) Impression on level of consumption (e.g., Percentage of families with children <5 and/or postpartum women regularly consuming (3/wk) sufficient amounts of fortified food)	Household survey Dietary assessment food frequency and focus group	MoH, university	at baseline and every 2 years

## Iron - Impact

	Question	Indicator	Population group	Data Collection Method	Who collects	Frequency of collection
	How has the iron status improved in the target population?	Biochemical: -Hemoglobin -Ferritin -Transferrin receptor -Zinc protoporphyrin	Non-pregnant women of reproductive age (18–45) Adolescent males/females Men (18–45) Infants and pre-school children (6–12; 12–35; 36–59 months)	Household surveys Mini surveys Clinic based data	MoH	At baseline and possibly 4 or 5 years after fortification program is well established (i.e., number of years after achieving min. coverage of X%) Routine monitoring (sentinel site survey) Ongoing (surveillance)

	<b>Question</b>	<b>Indicator</b>	<b>Population group</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
	How have other factors that affect iron status changed?	<u>Diet:</u> -iron intake -iron absorption enhancers (meat, vit. C) and inhibitors (tea)  Socioeconomic indicators  <u>Programmatic indicators (if applicable):</u> -Prevention/treatment of lead poisoning -vit A supplementation -improved breastfeeding -improved child spacing -changes in prevalence of other micronutrient deficiencies (vit B12, folate) -prevention/treatment of infections (malaria, parasites, hookworm)	Non-pregnant women of reproductive age (18–45) Adolescent males/females Men (18–45) Infants and pre-school children (6–12; 12–35; 36–59 months)	Household surveys Mini surveys Clinic based data	MoH	At baseline and possibly 4 or 5 years after fortification program is well established (i.e., X years after achieving min. coverage of X%) Routine monitoring (sentinel site survey)

## Iodine – Fortification

	Question	Indicator	Data Collection Method	Who collects	Frequency of collection
<b>Is the <u>intervention</u> functioning adequately?</b>	Is iodized salt available in sufficient quantity?	Amount of non-iodized and iodized food grade salt produced/imported/exported and distributed in the country (crude and per capita)	Salt industry production records Customs and salt industry/distributors reports on imports and exports Sales data	Salt producers/importers/distributors MoH, MoIndustry	Quarterly initially, then; every 6–12 months
		Amount of fortified food or salt imported	Routine reports from Customs, fortification supplier and salt industry.	Salt producers MoH	Every 6–12 months depending on frequency of import
	Is the quality and effectiveness of communication activities adequate?	Appropriateness of messages, materials and media used; Target population has adequate knowledge on importance of using iodized salt	Interviews, phased (household) survey, focus group, site visits; review communication plan and materials	MoH, universities, media and communication experts	Initially semi-annual; then every 2–3 years
<i>Factory level -Internal monitoring-</i>	Is iodized salt labeled and packaged according to determined standards?	Iodized salt samples/batches complying to national standards (within set range or above minimum level mg/Kg)	Salt analysis results , QC and LQAS records, inspection feedback forms	Salt producers/importers	Continuous (each batch)
		QA and QC procedures for salt iodization are followed	Factory procedures manual, QC and LQAS records and charts, production records	Salt producers/importers	Every 3 months
		Labeling, packaging and storage procedures and conditions are followed	Factory procedures manuals and reports	Salt producers/importers	Annually

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
<i>Factory level -External monitoring-</i>	Is food fortified, labeled and packaged according to determined standards?	Iodized salt samples/batches complying to national standards (within set range or above minimum level mg/Kg)	Random salt samples for analysis (factory & gov. analysis reports, fortificant purchase)	MoH, food inspectors	Every 1–6 months (depending on gov. capacity and experience of QC/ product reliability)
		QA and QC procedures for salt iodisation are followed	Inspection visit; QA/QC plan & reports	MoH, food inspectors	Every 6–12 months depending on programme status
		Labeling, packaging and storage procedures and conditions are followed	Inspection visit; factory procedures manuals and reports	MoH, food inspectors	Annual
<i>Wholesale and retail level =&gt; needed when iodine content of salt at household level does not meet standards and there is NO problem with fortification at production level</i>	Is iodized salt packaged, stored, and transported according to determined standards?	Iodine stability in salt. Packaging/repackaging materials used. Storage and transport facilities and procedures (First In First Out, turn over time). Salt samples/batches comply with national standards for iodine concentration at retail level	Market surveys & random investigation of salt iodization levels, packaging and storage conditions at major wholesalers/ retail outlets in the country	Salt distribution companies, MoH	When needed
<i>Household level</i>	Is the salt iodized and at appropriate level?	Salt samples comply with national standards for iodine concentration at household level	School or household survey; piggy back with other survey	MoH	Periodic (1st year, then 2–3 yearly), ongoing
<b>Is the intervention available, affordable and acceptable to the population?</b>	Is iodized salt available to the target population?	Number of households with access to iodized salt	Situation analysis, sales records by geographic distribution, market survey. Results of household coverage surveys	Salt producers/ importers and distributors, MoH	Semiannually or annually
	Is iodized salt affordable for the population?	Price of iodized salt compared to non-iodized salt	Market survey, price listings (if relevant) of iodised and non-iodised salt	MoH, MoCommerce, salt industry	Annual

	<b>Question</b>	<b>Indicator</b>	<b>Data Collection Method</b>	<b>Who collects</b>	<b>Frequency of collection</b>
	Is iodized salt acceptable to the population?	Perception of iodized salt among the population and awareness of its existence and benefits or misconceptions regarding its use	Focus groups, phased (household) survey	MoH	Initially first year; then every 2–3 years
<b>Is the intervention being <u>used</u> by the population?</b> <i>(Coverage)</i>	What percentage of households use iodized salt (by region/age group)	Number of households in which only iodized salt is available.	Household/school survey; piggy back on other surveys	MoH, university, MICS/DHS	At baseline and every 2 years Or ongoing "mini-surveys"

## Iodine - Impact

	Question	Indicator	Population group	Data Collection Method	Who collects	Frequency of collection
<b>How has the micronutrient status improved in the population?</b>	How has the iodine status improved in the population?	<p><u>Biochemical:</u> Urinary iodine excretion (UIE),</p> <p>Neonatal TSH (if screening programme for hypothyroidism already in place)</p> <p><u>Clinical:</u> Total goitre rate (TGR) (not a sensitive marker of impact, especially in early years of the intervention)</p>	<p>For UIE — any group aged 3 or older. Usually school age children (6–12 years old) or women of reproductive age.</p> <p>For TSH – neonates</p> <p>For TGR – children 6–12 years old</p>	Household surveys Mini surveys Clinic based data	MoH	At baseline and possibly after 4 or 5 years Routine monitoring, sentinel site survey Ongoing surveillance

The Monitoring Frameworks were developed by Arnold Timmer and Jacky Knowles.

### References:

Monitoring Vitamin A Programs MI1998. Edited by J. Cervinkas & R. Houston

Indicators for assessing Vitamin A Deficiency and their application in monitoring and evaluating intervention programmes. Document WHO/NUT/96.10. [http://whqlibdoc.who.int/hq/1996/WHO\\_NUT\\_96.10.pdf](http://whqlibdoc.who.int/hq/1996/WHO_NUT_96.10.pdf)

Monitoring Universal Salt Iodization Programmes UNICEF, PAMM, MI, ICCIDD, WHO1995. Edited by K. Sullivan, R. Houston, J. Gorstein, J. Cervinkas

Iron Deficiency Anaemia. Assessment, Prevention, and Control. A Guide for Programme Managers. WHO, UNICEF, UNU 2001

[http://www.who.int/nut/documents/assessment\\_idd\\_monitoring\\_elimination.pdf](http://www.who.int/nut/documents/assessment_idd_monitoring_elimination.pdf)\*

Assessment of Iodine Deficiency Disorders and Monitoring their Elimination. A Guide for Programme Managers. Second Edition. 2001

[http://www.who.int/nut/documents/ida\\_assessment\\_prevention\\_control.pdf](http://www.who.int/nut/documents/ida_assessment_prevention_control.pdf)\*

\* Links to non-Federal organizations are provided solely as a service to our users. Links do not constitute an endorsement of any organization by CDC or the Federal Government, and none should be inferred. The CDC is not responsible for the content of the individual organization Web pages found at this link.