Universal Salt Iodization In Nigeria

Process, Successes and Lessons

unicef

PREFACE

Nigeria continues to provide leadership in Africa in various fields. However, in the Health sector, generally speaking, Nigeria has performed quite poorly. Our country is the largest contributor to childhood mortality in Africa (and the 6th largest in the world). In particular, neonatal deaths are responsible for 40% of such deaths, a figure that is totally unacceptable, for largely-preventable childhood deaths.

It is precisely for this reason, to frontally tackle these real malaise and disturbing statistics in our country, that the on-going Health sector reforms were instituted in 2005. For these reforms to achieve the impact desired, nothing less than a fundamental change of mind-set is required by service providers, particularly for Primary Health Care, and the general population

With this in mind, the Nigerian Government launched its National Food and Nutrition Policy in November 5 2002, underscoring its determination to improve the well-being of its populace. That policy set definite targets, which included reduction of micronutrient deficiencies (principally VAD, IDD, and IDA) by 50% by 2010, and severe and moderate malnutrition among under-fives by 30%, by 2010.

Since then, Nigeria's the Health Sector has made tangible progress and achieved significant successes. Today, Nigeria is the flagship of African nations, acting on and succeeding in, mitigating the large-scale losses of brain-power and productivity caused by Iodine Deficiency Disorders (IDD). Virtually all Nigeria's newborns are protected against the mental impairment arising from the absence of iodine, in adequate quantity, in the diet. Not only has Nigeria been 'put on the map' in the world, for achieving Universal Salt Iodization (USI), it has become the benchmark for other nations needing to and aiming for the same feat.

Success in salt iodization is gratifying, constructive and instructive. Perhaps the most telling lesson learned from the USI project in Nigeria is the partnership principle. By mobilizing the private sector (including manufacturers), government agencies, and development partners to work for a common, mutually-beneficial goal, Nigeria took a significant step in assuring the well being of its future, today's Nigerian child. Equally significant is the fact, important for the West African sub-region, that without Nigeria's USI success, 76% of households in the sub-region would have lacked access to iodized edible salt, not the 41% currently reported for the sub region.

It is my sincere hope that documenting and publishing this story of Nigeria's USI success provides detailed information and inspires all concerned with improving the well-being of children everywhere.

Professor Eyitayo Lambo
Honourable Minster of Health
Nigeria

FOREWORD

On the strength of evidence that iodine deficiency was a singular cause of most cases of mental retardation in children and one of the contributing factors to high infant mortality, the World Summit for children (WSC) had resolved in 1990 to virtually eliminate iodine Deficiency Disorders (IDD) from the face of the earth by the year 2000. At that Summit, world leaders, including from Nigeria, committed themselves to specific goals to ensure the right of children to adequate nutrition, among other rights.

Although Nigeria, with a population of over 140 million and enormous natural resources, is yet to achieve most of the goals set by WSC, it has achieved remarkable success in its Universal Salt Iodization (USI) programme.

The USI programme took-off effectively in Nigeria in 1993, at a time when only 40% of salt consumed in Nigeria was iodized. Over the following 5 years, goitre prevalence decreased to 11% at sentinel sites, and household access to iodized salt increased to 98%.

The actual process of evaluating and documenting USI progress in Nigeria commenced in 2001, but suffered from a dearth of retrospective data, particularly on the key indicators required by the Iodine Global Network for purpose of evaluation. As part of its technical and financial support to the Government of Nigeria, UNICEF fostered the institutionalization of an IDD/USI taskforce, comprising relevant partners (including the salt producers/marketers, government regulatory agencies/line Ministries, development partners and donors, consumer associations and the various media). This taskforce had responsibility for assessing iodine levels in edible salt (quarterly at factory and wholesale levels, and annually at retail and household levels), and convening quarterly meetings to review and document results of the assessment. Those results exposed challenges that in turn provided the basis for continuous process improvement.

In spite of challenges of local production and smuggling of non-iodized salt into the country, national regulatory agencies have, by and large, succeeded in ensuring that manufacturers and marketers adhered to the mandatory standards. Awareness amongst the consumers on the need to demand for and consume iodized salt, and small scale local salt producers are being to iodize their salt or explore alternative sources of income for themselves.

This report is a compendium of the Nigeria IDD/USI evaluation by experts in the field and formed the basis for the external assessment of Nigeria's IDD/USI programme by the Global Iodine Network, in December 2005. Nigeria's achievement of USI was globally recognized and acknowledged in December 2005, the first African country to receive such certification.

The report is a useful guide on the process and challenges countries are likely to face, and provides options to overcome bottlenecks against achieving USI globally, but especially in the West and Central Africa sub region. Another report, of the USI certification mission to Nigeria has also been published and widely distributed by the Global Iodine Network.

Over many years, UNICEF Nigeria received much funding and support from the UNICEF Headquarters in New York and the Regional Office for West and Central Africa, and the United States Agency for International Development (USAID), to push USI in the country. Value for the funds received and expended is high, and our collective hope is that lessons learned during the project will benefit the rest of the world, and enhance child survival and development.

Ayalew Abai
Country Representative,
UNICEF Nigeria.

ACKNOWLEDGEMENTS

The Federal Government of Nigeria is gratified that the process, successes and lessons learned from Salt iodization in the country is now documented to assist other countries attain Universal Salt Iodization (USI).

In this regards, our thanks go to the Federal Ministry of Health (FMOH) who constituted an inter-Ministerial and inter-disciplinary national team of experts, drawn from public, private and civil society organizations, to support the USI in Nigeria.

I also mention and thank various other entities that participated actively to promote USI in Nigeria, and the national expert committee on USI, which comprised of the Federal Ministry of Education (FME), National Agency for Food and Drug Administration and Control (NAFDAC), Standard Organization of Nigeria (SON), University College Hospital (UCH), Ibadan; Unilever Nig. Plc, and the Micronutrient Initiative (MI). Let me acknowledge specifically the members of that committee which included Dr. Adenike Adeyemi (FMOH), Ms Tina Eyaru (FME), Mr. S.O. Ajayi (NAFDAC), Ms Margaret Eshiett (SON), Ms Kate Demehin (FMOH), Dr O.M. Akinosun (UCH), Mr. Desmond Adeola (Unilever), Dr Francis Aminu (MI), and Dr Isiaka Stevens Alo (UNICEF).

Mr. Jack Bagriansky deserves mention. This international consultant meticulously evaluated and documented Nigeria's country's USI programme, ahead of the assessment by the Global Iodine Network.

I wish to also thank the many individuals who gave audience to both the national and international team of experts in the course of evaluating the USI project in Nigeria. These persons include the Director General, NAFDAC, Professor Dora Akunyili; the Director General, Standard Organisation of Nigeria, Dr John Akanya; and the Executive Director, Unilever Nigeria plc, Mr. Tuyi Ehindero. Others include Doris Amlai (Director, EID, NAFDAC); P.C. Monwuba (CRO, NAFDAC); Sariel, S.A. (PRO, NAFDAC); Abubakar Jimoh (Head, PR, NAFDAC); Professor Taoheed Adedoja (Chairman, Oyo State UBEB); Honourable Adu Adeleke (Speaker, Oyo State House of Assembly); A.T. Ashaolu (General Manager, Unilever); T.K. Ethan (SON); and Rajesh Kumar (Marketing Manager, Royal Salt Ltd).

My special thanks go to the Country Representative, UNICEF Nigeria, Mr. Abai Ayalew; Team Leader, Nutrition and Early Childhood Care, Professor Frank Onyezili; UNICEF Project Officers in Nutrition, past and present, particularly Dr. John Egbuta, Dr Isiaka Alo, Dr. Sylvester Igbedioh, Ms Ada Ezeogu, Ms Gladys Sule, and Dr. Danjuma Almustafa

On behalf of the good people of Nigeria, especially children and women, I thank all who for made the USI programme the resounding success that it is.

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Chief of Health and Nutrition
UNICEF, Nigeria

LIST OF ACRONYMS

CDC	Centre for Disease Control
CDPA	Community Development and Population Activities
ECSA	East, Central and Southern Africa (formerly Commonwealth Regional Health Community (CRHC).
FAO	Food and Agricultural Organisation
FGN	Federal Government of Nigeria
FME	Federal Ministry of Education
FMOH	Federal Ministry of Health
GMP	Good Manufacturing Practice
ICCIDD	Inter-departmental Committee for the Control of Iodine Deficiency Disorder
ICN	International Congress on Nutrition
IEC	Information, Education and Communication
IDD	Iodine Deficiency Disorder
IITA	International Institute of Tropical Agriculture
LGA	Local Government Area
MI	Micronutrient Initiative
MT	Metric Ton
MUI	Median Urinary Iodine
NAFDAC	National Agency for Food and Drug Administration and Control
NASCON	National Salt Company of Nigeria
NBS	National Bureau of Statistics
NFA	National Fortification Alliance
NFCNS	National Food Consumption and Nutrition Survey
NIS	Nigerian Industrial Standard
NPHCDA	National Primary Health Care Development Agency
OAU	Organisation of African Unity
PHN	Public Health Nutrition
PZ	Paterzon Zochonis
QA	Quality Assurance
QC	Quality Control
SON	Standard Organisation of Nigeria
SUBEB	State Universal Basic Education Board
TGR	Total Goitre Rate
UBEB	Universal Basic Education Board
UCH	University College Hospital
UNICEF	United Nations Children's Fund
USI	Universal Salt Iodisation
WAHO	West African Health Organisation

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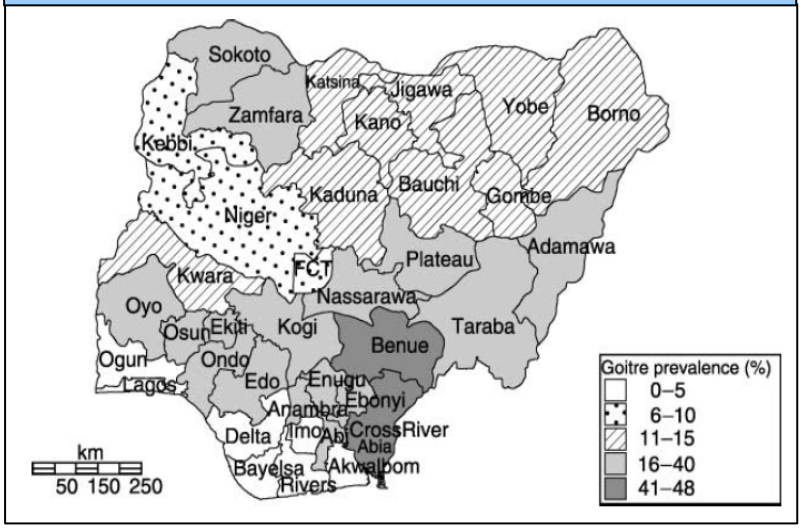
I. WHAT HAS HAPPENED TO IDD IN NIGERIA?

IDD has been recognized as a public health problem in Nigeria for three decades.[4] Data from 1988 found TGR of 67% in endemic states.[5]An expert review committee convened by the Federal Ministry of Health in 1988 compiled TGR data for 7 states ranging from 16-36%.[6] In 1990, *Women and Children in Nigeria, a Situation Analysis* reported TGR ranging from 24% to 36% in four additional states.[7] A map compiling surveys from a range of sources drawn by Egbuta et al shows only 5 states, mainly along the coast, with less than 5% TGR.[8] A 1993 survey covering 16 states indicated an average TGR of 20%.[9] In 1998, a re-evaluation comparing TGR in the same 16 States 5 years later found TGR declining to an average 10.6%.[10]

Goiter Prevalence by State in Mid 1990's
From Egbuta & Onyezili, PHN 2002



Goiter Prevalence in Years Previous to Initiation of USI in Nigeria from Various Surveys & Sources

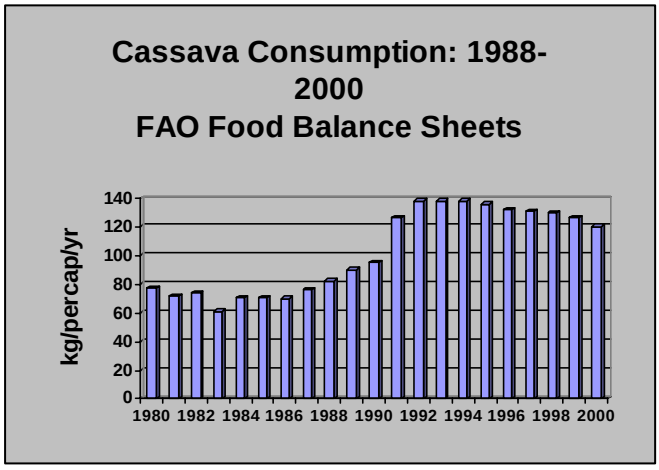
1988[1]		1990[2]		1993[3]	
State	TGR %	State	TGR %	Zone	TGR %
Anambra/Enugu	36	Bassa	36%	South East	37.2%
Cross River	34	Obudu	33%	South West	28.7%
Edo	19	Uzo Uwani	28%	North West	12.5%
Benue	28	Okpokwu	24%	North East	13.4%
Oyo	24			National	20%
Ondo	26				
Plateau	16				

[1] Ekpechi et al from Essence of Life, Egbuta, 1993
[2] In Women & Children in NIgeriaL A situation Analysis, FGN & UNICEF, 1990
[3] Essence of Life, Egbuta, 1993
[4] Ekpechi O.L.: Pathogenesis of Endemic Goiter in Eastern Nigeria, Br. J of Nutrition, 21 (3):1967
[5] Egbuta, Frank, Onyezili; Impact evaluation of efforts to eliminate iodine deficiency disorders in Nigeria, Public Health Nutrition: 6(2), 169–173, September 2002
[6] Ekpechi et al from Essence of Life, Egbuta, 1993
[7] Ibid
[8] Ibid
[9] Essence of Life, Egbuta, 1993
[10] From Children & Women's Rights in Nigeria: A Wake-Up Call, UNICEF 2001

Comparison of World Population Affected by Goiter in 1990 and 1999[11]		
	1990	1999
Africa	15.60%	20%
America's	8.70%	5%
Eastern Med	22.90%	32%
Europe	11.40%	15%
South East Asia	13%	12%
Western Pacific	9%	8%
Total	12%	13%

Something remarkable happened since 1993. While total goiter rates in Africa as a whole climbed nearly 30% in the 1990s[13], most evidence indicates TGR has cut in half. Surveys found populations affected by goiter prevalence in 30 states dropped from 40 million in 1990 to less than 11 million in 1999.[14] An evaluation comparing TGR in 10 identical Local Government Units (LGA's) indicated lowered prevalence, an average of 75% in most areas.[15] Two LGAs with less improvement, 5-12% in Akoko-Edo and Ekiti-East, are located in contiguous states in the western region of the country where the major food staple is cassava, a powerful goitrogen which inhibits utilization of dietary iodine. Cassava consumption may mask true changes in iodine nutrition. During times of economic downturn, as in the 1990's in Nigeria, there are suggestions that cassava consumption grows as the poor turn to this less expensive staple to meet daily needs. In fact, according to FAO Food Balance Sheets, the years 1988-1998 saw a dramatic increase in per capita cassava consumption among Nigerian consumers.

TGR for Identical LGA's 1993 & 1999[12]			
State	**LGA**	**1993**	**1998**
Enugu	Uzo-Uwani	67	9.8
Cross River	Obudu/Obanlike	62	14.9
Benue	Okpokwu	60	9.4
Edo	Akok-Edo	32	30.4
Ekiti	Ekiti East	38	33.4
Oyo	Saki	36	16.2
Katsina	Bakon	11	2.9
Zamfara	Anka	22	2.9
Kano	Gwarzo	13	4.1
Plateau	Bassa	26	4.7



Possibly, the drop in TGR recorded during the decade may have been more uniform and pronounced if an improving economy had allowed consumers to purchase a more diversified diet. Several years later, models used by UNICEF and the Micronutrient Initiative in *Nigeria: A Damage Assessment Report* in 2004 estimated a lower TGR of 7.7%.[16]

Biochemical assessments with urinary iodine mirror the dramatically lower TGR recorded during the 1990's. A study from 1998 published in *Public Health Nutrition* reported mean levels of urinary iodine content of 146.5 ug/l with a median of 133.9 ug/l - ranging from 90-156 ug/l over 10 states surveyed.[17] These results are reinforced in the *Nigeria Food Consumption and Nutrition Survey* (NFCNS) undertaken by the International Institute of Tropical Agriculture (IITA) in 2001 which found median urinary iodine (MUI) levels in children under 5 years of age ranged from 119 to 309 ug/L

[11] From Delange, Benoist et al, Iodine Deficiency in the World: Where Do We Stand at the Turn of the Century?, Thyroid, Volume 11, Number 5, 2001
[12] ibid
[13] WHO/ICCIDD in Delange, Benoist et al, Iodine Deficiency in the World: Where Do we Stand, Thyroid, Volume 11, Number 5, 2001
[14] IDD Newsletter Volume 16, Number 1 Feb. 2000
[15] JEgbuta, Frank, Onyezili; Impact evaluation of efforts to eliminate iodine deficiency disorders in Nigeria, Public Health Nutrition: 6(2), 169–173, September 2002
[16] Nigeria Damage Assessment Report, UNICEF, MI, 2004
[17] Ibid

Values for Urinary Iodine Excretion from 1998:
From Egbuta & Onyezili, PHN 2002

State	LGA	*n*	Range ($\mu g\,dl^{-1}$)	Median ($\mu g\,dl^{-1}$)	Mean ($\mu g\,dl^{-1}$)	Standard deviation
Enugu	Uzo-Uwani*	46	10.6–20.0	15.65	15.72	2.75
Cross River	Obudu/Obanliku*	80	6.4–20.0	14.70	14.75	3.88
Benue	Okpokwu*	94	1.0–19.8	14.80	14.03	4.75
Edo	Akoko-Edo*	41	1.0–19.4	14.00	13.96	4.11
Ekiti	Ekiti East*	42	5.8–19.8	14.60	13.56	3.81
Oyo	Saki (Ifedapo)*	56	1.6–20.0	9.20	9.15	5.17
Katsina	Bakori†	29	5.2–16.8	10.60	11.35	3.77
Zamfara	Anka†	62	6.5–20.0	15.55	14.59	4.20
Kano	Gwarzo†	37	3.0–20.0	12.60	11.45	5.08
Plateau	Bassa*	50	10.0–19.4	15.50	15.06	2.83
Total		537	1.0–20.0	14.65	13.39	4.04

LGA – local government area.
*LGAs where iodine deficiency disorders (IDD) are hyper-endemic.
†LGAs where IDD was not previously known as a public health problem.

with about 4% classified severe IDD and 9% moderate.[18] For women and pregnant women, median UI also indicated IDD as mild-to-non existent public health threat. It might be noted that in the NFCNS study, urinary iodine results from Edo State were markedly better than the national averages as opposed to earlier TGR data from selected LGA's in Edo State which reported continuing high goiter rates and suggesting only small improvement.[19] This suggests that with goitrogenic effects of increasing cassava consumption, TGR as an indicator may not adequately reflect the true extent of Nigeria's gains in eliminating IDD as a public health problem. A more recent data point will be established in the fall of 2005 with the completed analysis of more than 12,000 samples from school aged children, currently being analyzed at Chemical Pathology Laboratory in the Department of Endocrine Metabolism, University College Hospital (UCH) in Ibadan, Nigeria.

Severe and Moderate IDD in Children, Mothers & Pregnant Women in 12 States Nigeria Food Consumption & Nutrition Survey[20]

	Children < 5		Mothers		Pregnant Women	
	% Severe < 20 ug/L	% Moderate 20-49 ug/L	% Severe < 20 ug/L	% Moderate 20-49 ug/L	% Severe < 20 ug/L	% Moderate 20-49 ug/L
Nasarawa	7	16.1	11.3	16.5	7.9	5.3
Taraba	6.6	11.5	6.3	13	6.5	17.4
Borno	4.2	4.2	2.4	8.7	0	8.9
Kaduna	3.7	12.2	6.2	8.7	1.8	8.9
Kebbi	11.4	4.6	14.6	15.2	6.7	6.7
Kano	1	1.4	0.3	2.1	1.9	3.8
Osun	1.5	8.5	3.7	9.2	3.5	6.9
Edo	0.5	4.8	2.4	5.7	0	5.6
Kwara	1.8	9.9	2.4	7.9	2	5.9
Imo	2.7	5.3	1.7	5.1	2.7	8.1
Bayelsa	0.6	2.4	0	3.4	2.6	0
Akway Ibom	4.6	8.7	6.2	13.3	10	7.5
Total	4.2	8.7	4.2	8.8	3.1	7.4

Methodology developed by the Micronutrient Initiative (MI) and UNICEF in *Vitamin and Mineral Deficiency: A Damage Assessment Report;* projects national benefits derived from a decrease in TGR (from 20% estimated for 1993 to 7.7% estimated for 2004) reaching 590,000 fewer babies born with intellectual impairments annually and the future productivity gains of $220 million per year to the Nigerian economy.

[18] Nigeria Food Consumption and Nutrition Survey: 2001-2003, IITA
[19] Egbuta, J, Onyezili, F; Impact evaluation of efforts to eliminate iodine deficiency disorders in Nigeria, Public Health Nutrition: 6(2), 169–173, September 2002
[20] Compiled from NFCNS, 2004

Projecting National Benefits of Decrease in IDD as indicated by TGR decrease from 20% to 7.7%[21]		
	NPV Lost Productivity	**Babies born with intellectual impairment**
	$ '000,000/yr	'000/yr
Projecting Status Quo of TGR from 1993: 20%	356.9	958
Projected by UNICEF/MI DAR: 7.7%	$137	368
Implied National Savings Achieved by TGR reduction	$220	590

II. Establishing USI in Nigeria:

The engine for this remarkable public health achievement? Since 1995 various Nigerian government agencies and other institutions have been reporting adequate iodization of more than 90% of salt for human consumption. While several efforts to establish IDD control program in Nigeria failed to gather momentum from 1974 to 1990, following the World Summit for Children, OAU sponsored Dakar Consensus and the ICN Resolutions of 1992, a multi-sectoral effort succeeded in establishing Universal Salt Iodization in Nigeria.[22] In 1992, following a consensus-building workshop including participants from Standards Organization of Nigeria (SON) and Federal Ministry of Health (FMOH) as well as major domestic salt importers, distributors and packagers, SON, the agency charged with maintenance of standards for all manufactured/imported products (including food and drugs), mandated that all food grade salt be iodized with 50ppm potassium iodide at packaging stage (NIS 168:1992).

Since Nigeria's a handful of large domestic salt companies import almost all salt for national consumption through 4 major ports, the market environment to achieve USI was very favorable. Iodization essentially involved specifying the required iodization levels from overseas suppliers in South America, Europe, Australia and Southern Africa. Despite, support of all salt companies, a year after the original SON mandate less than 40% of Nigeria's salt contained adequate levels of iodine.[23]

Based on a growing body of evidence from USI programs worldwide indicating major losses of potassium iodide, especially when sold in bulk in open air markets where the product is exposed to the elements, SON published a revised standard for food grade salt, specifying potassium iodate to improve retention (NIS 168:1994).

The revised SON standard specifies over-all quality parameters for food grade salt, establishes packaging, labeling, transport and storage requirements, specifies analytical methods, and outlines substantial legal penalties -

[21] Micronutrient Initiative & UNICEF, Vitamin & Mineral Deficiency Damage Assessment Report, 2004
[22] Essence of Life, Egbuta, John 1993
[23] Ibid

consignments not meeting standard can be impounded and/or sent to an iodization facility prior to entering the market. The standard defines properly iodized salt as:

- ✓ > 50 ppm iodine at port of entry and salt factory level
- ✓ > 30 ppm iodine at distributor and retail levels
- ✓ > 15 ppm iodine at household level

Factory Level Monitoring by SON		
	Consignments	% Compliance
	#	% > 50 ppm
1995	40	100%
1996	35	97%
1997	22	100%
1998	30	90%

Since 1995, SON records of inspection at port of entry and at salt companies consistently indicate 90-100% of consignments with iodine levels above 50 ppm. An independent report found 97% of food grade salt met 50ppm standard in 1995.[24] These findings were reinforced in 1999, with UNICEF MICs Survey indicating 98% of Nigerian households consumed adequately iodized salt.[25]

III. Sustaining USI in Nigeria

Sustaining the achievement of high coverage requires coordination of multiple sectors to maintain ownership and commitment and coordinate key stakeholders to assure quality production, raise consumer awareness and monitor results. Nigeria's transition to democracy in 1999 required new approaches to sustaining the achievements of the 1990's. Decentralization of government institutions posed challenges to maintaining activities of enforcement and regulatory personnel. While salt continued to be primarily imported and centrally repackaged, major shifts in market place emerged as some companies went bankrupt and others entered the market. These factors present challenges to regulating the salt market place, monitoring iodine nutrition and sustaining awareness and commitment to USI. The program adapted to sustain the achievements of the 1990's.

[24] Ibid
[25] From Children & Women's Rights in Nigeria: A Wake-Up Call, UNICEF 2001

- *Multi Sectoral Cooperation and Collaboration:*

In 2002, an official multi-sectoral IDD-USI Task Force was established, with the support of UNICEF Nigeria, with a secretariat at SON and participation by, FMOH, FME, NAFDAC, salt producers and the Micronutrient Initiative (MI). The Task Force coordinates the multi-sectoral range of Task Force partner institutions to routinely monitor the market place through product registration, surveillance and inspection activities. In addition, consultation meetings and workshops, and public education and social marketing activities ensure communications among partners and sustain awareness.

The National Agency for Food & Drug Administration and Control (NAFDAC), established as a para-statal of the FMOH in 1999 with the mission to "safeguard public health by ensuring that only the right quality of drugs, food and other regulated products are manufactured, imported, exported, distributed, advertised, sold and used,"[26] is a key new partner in this multi-sectoral body. With firm commitment to USI and wide ranging enforcement powers, NAFDAC is reported to have destroyed more than 10,000 bags (20 kg) of non-iodized salt at the distributor and retail level since it joined the Task Force.[27]

In addition to providing a platform for opening channels of communication among government agencies, the private sector and consumers, the Task Force clearly defined roles and responsibilities for enforcing and monitoring USI:

- ✓ SON: Inspection of consignments at ports and at least bi-annual inspections of salt companies – with number of inspections based on performance.

- ✓ NAFDAC: Ongoing distributor and retail level inspection and enforcement throughout the country including registration of consumer products – which requires GMP compliance of salt companies with iodization integrated into GMP.

- ✓ FME: Coordinates annual collection of salt samples from school children in primary schools as proxy for household access to iodized salt.

- ✓ Salt Companies: Keep internal quality control records including tests by titration as well as comply with over-all GMP.

Since 2002, these institutions have demonstrated the commitment and capacity to continuously monitor the market place generating continuous data tracking trends that may impact the effectiveness, safety, and sustainability of USI.

- *Monitoring Process: Reporting from Markets and Households*

The Task Force has compiled regular national records of salt coverage at the factory, distributor, retailer and household level. Both SON and NAFDAC offer titration capacity for both primary analysis and back up of qualitative iodine test kits used in the field. Since 2002, SON inspections at ports and factory continue to show high compliance with the mandatory standards. Titration analysis at SON Labs and internal salt company quality control records show parallel and reinforcing results with iodine content ranging from 51-73 ppm at the port and factory levels.[28]

Results of NAFDAC retail and distribution level surveys for 2002, 2003 and for first 6 months of 2005 indicate 97-100% of salt meets standard of > 30 ppm iodine content.[29] Salt is tested in the field by NAFDAC inspectors with qualitative iodine field test-kits and failed samples are taken to NAFDAC Labs for confirmation by titration analysis. While NAFDAC

[26] Mission Statement from NAFDAC, Appraisal and Consolidation 2004
[27] Daily Independent, June 6, 2004, Onyekachi Eze, Senior Reporter Abuja
[28] Report on Situation Assessment of Production, Marketing and Consumption of Iodized Salt in Nigeria, IDD-Task Force, 2002,
[29] No national compilation was undertaken in 2004 when NAFDAC concentrated its resources and supply of test kits on 4 States Nasarawa, Taraba, Benue and Ebonyi which were determined to have relatively higher levels of low levels or un-iodized salt.

acknowledges some lapses in data gathering and some statistical inadequacies in the survey methodology in 2002 and 2003, these are reportedly corrected in the 2005 analysis.[30] However, all surveys are extensive covering more than 600 LGAs in 2002 and 2003 and improving to 771 LGAs in the first 6 months report of 2005. Since 2002, approximately 20,000 salt samples have been analyzed.

	Iodized Salt Distributor & Local Retail levels From NAFDAC Surveys of 2002-2005				
		Distributor		Retail	
Year	# LGAS Covered	# Distributors Covered	% > 30 ppm	# samples	% > 30 ppm
2002	669	445	97.50	441	90.2
2003	613	805	98.40	8487	99.82
2005 Jan-Jun	771	355	100.00	2677	99.80

Monitoring household access to quality iodized salt is via national sample of primary schools, with children bringing salt samples to class for testing. In cooperation with the Federal Ministry of Education (FME), NPHDCA conducted the initial survey in 2002, but could not sustain the effort in 2003 assessment due to logistical and financial constraints.[31] Subsequently, FME joined the IDD-USI Task Force and agreed to sustain annual assessments at primary schools in close collaboration with State Universal Basic Education Boards (SUBEB). The 2002 and 2005 surveys randomly selected 30 primary schools in each of the country's 6 geographic zones. In each school, 7 salt samples were randomly selected from samples brought by the students for testing with iodine field test kits - with a selected sub-sample forwarded to NAFDAC labs for titration analysis. The 2002 survey found an average 88.5% of salt contained > 15 ppm iodine, ranging from 84%-95% in the 6 geographic zones. The 2005 school sample indicated an average of 90.5% properly iodized salt ranging from 83-98% in the 6 zones. These reinforcing results are further validated by the 2003 Nigerian Demographic and Health Survey which found 97% adequately iodized salt in households with only minor variation of 1-2% among urban and rural households.[32]

Surveys Reporting Household Access to Properly Iodized Salt 2002-2005			
	2002 - NPHCDA/FME 1256 samples	2005 – FME 1260 samples	2003 - NDHS
	% > 15 ppm	% > 15 ppm	% > 15 ppm
North Central	84.4	83.3	92.7
North East	90.0	96.7	98.8
North West	95.2	97.1	98.2
South East	82.5	81.0	97.0
South South	92.9	86.2	98.0
South West	85.7	98.6	98.0
Total	88.5	90.5	97.3

Nigeria's salt companies operate the necessary quality control departments to ensure standards are met, including salt titration facilities. To meet product registration and GMP requirements, companies keep records on a number of critical quality control parameters including requiring and reviewing certificates for analysis for iodization of each shipment. Several companies conduct regular meetings with distributors to sustain awareness, receive feedback and track quality issues.

[30] NAFDAC, Report on Iodized Salt Monitoring at Distribution and Retail Levels in Nigeria, December 2003
[31] *Report Of* FME NATIONAL HOUSEHOLD LEVEL ASSESSMENT OF IODINE LEVEL IN SALT, Submitted to UNICEF, June 2005

[32] Nigeria Demographic and Health Survey, Federal Government of Nigeria, 2003

- *Monitoring Results: Surveillance of Iodine Nutrition*

The Task Force synthesizes data from factory, distributor, retail and household level and forwards annual reports to the coordinating focal point in the Directorate of Community Development and Population Activities (CDPA) of the FMOH. Within the CDPA, USI data will be integrated with nutrition surveillance activities as well as coordinated with the comprehensive Nigerian fortification program including oil and sugar with vitamin A and wheat flour with a range of vitamins and minerals.[33] In the fall of 2005, FMOH with technical support from University College Hospital completed analysis of a substantial survey including more than 12,000 records from primary school children for TGR and urinary iodine. Results enabled statistically significant national data and segmentation by zone and state as well as correlation of these three indicators – TGR, urinary iodine and salt quality[34]. FMOH-CDPA is working on several fronts to strengthen the nutrition surveillance system to gather ongoing TGR and/or urinary iodine data.[35]

- *Creating and Sustaining Awareness*

Communications and social marketing have been used extensively to create and sustain awareness of IDD and the importance of USI. In the year after SON standards where published in 1993, the media was involved in a series of workshops and seminars and as a result, "IDD was featured on national television and radio prime time news, beamed to 30 million Television viewers and 60 million radio listeners. An IDD documentary and jingles were produced for constant airing on television and radio, and a national IDD logo was developed and is embossed on every salt bag sold in the country."[36] A market survey in Enugu State from 1997 found iodized salt was preferred by 100% of distributors, 86% of wholesalers, 73% of retailers, and 91% of hawkers."[37]

Today, while the members of the IDD-USI Task Force do not implement a formally integrated communications strategy, the various partners conduct a range of educational and promotional activities, each concentrating on their area and audiences of relative advantage. NAFDAC conducts generic multi-channel consumer education campaigns focusing on the threats of IDD, health benefits of iodized salt and generic promotion via the Nigerian USI logo. Over the past 2 years the campaign has included:

- ✓ Billboards advertising the need for consumption of iodized salt in strategic areas of the country.
- ✓ Numerous newspaper campaigns and public notices.
- ✓ Regular Radio and Television jingles
- ✓ Posters and print materials capturing sensitive information on USI.

The Director General, NAFDAC, and other officials routinely conduct government advocacy reaching national officials, state governors and legislators and local officials. NAFDAC regularly conducts one-on-one meetings with local and religious leaders as well as community awareness raising workshops. For example, six zonal sensitization workshops were conducted in 2004.

In secondary schools throughout the nation, USI and IDD awareness is integrated into the activities of NAFDAC's 370 "Consumer Safety Clubs" which aim to "inculcate in Nigerian youths the culture of prevention and safe living through the rejection of fake drugs, unwholesome foods and other substandard products."[38] In 2004, IDD and USI were the themes for the Consumer Safety Club national Secondary School Essay competition. After

[33] Nigeria recently was awarded a $2.4 million grant from Global Alliance for Improved Nutrition for strengthening of regulation and enforcement, social marketing and biological evaluation of Vitamin A fortification (flour, oil and sugar) activities.
[34] See report of study on 'Assessment of Total Goitre Prevalence and Urinary iodine in Nigeria'
[35] See section on Addressing Challenges to USI
[36] John Egbuta, Nimal Hettiaratchy "Status of Iodine Deficiency Disorders in Nigeria 1993-1995" Report to ICCIDD Board, 1995
[37] E.C. Okeke, D.O. Nnanyelugu, C. Awa. Towards Improved Salt Iodization in Enugu State. IDD Newsletter, Volume 13 Number 4 November 1997
[38] Daily Trust Newspaper, page 42, August 11, 2004

local competitions, winners of the televised grand finale competition were awarded prizes by the then First Lady of Nigeria, Mrs. Stella Obasanjo.

Media advocacy and press relations activities are extensively implemented. As a result, USI and IDD receive wide coverage as health, consumer, food safety and quality as well as over-all business and industry issues. Media companies have made significant commitments of free-airtime or ad space for USI promotions.

FME is planning to expand the annual household salt quality monitoring survey to include wrap-around health and consumer education activities. For long term sustainability, education in the importance of iodine nutrition and iodized salt will be integrated into an ongoing curriculum revision. FME is also considering the feasibility of a Micronutrient Day activity in all primary and secondary schools.

Generic education and promotion by public agencies is complemented by brand marketing by salt companies. As packaged brands continue to gain market share, the private sector is increasingly investing in marketing and education along with traditional branded advertising. Unilever is currently involved in a three-year program aiming to reach every Nigerian school child with iodine nutrition education along with promotion for its *Annapurna* brand of salt. Significantly, 50% of this marketing and education investment is dedicated to rural areas and 30% in peri urban areas with the remainder in more traditional urban areas.

IV. Addressing Challenges to USI

Improving Product Quality

While inspections at port, factory and distributor level consistently indicate 97-100% proper iodization, delivering adequate levels at retail and household level leaves room for improvement. While FME school surveys in 2002 and 2005 confirmed 88.5-90.5% adequately iodized salt, only 1-2% was non-iodized salt. The remaining 8-10% of salt at the household level offers inadequate iodine, ranging up to 14% of samples in some zones. This suggests substantial iodine loss at the retail level, particularly when salt is exposed to moisture and sunlight after decanting from 20 kg bags and displayed in open bowls (*mudus)* in Nigeria's open markets. Distributing salt in smaller, airtight and moisture-proof consumer packs,

Inadequately Iodized Salt by Zone
From FME School Surveys 2002 & 2005

Zone	2002 Survey	2005 Survey
	% > 0 < 15 ppm	% > 0 < 15 ppm
North Central	9.5	12
North East	10	3.3
North West	4.8	2.4
South East	16	14.3
South South	5.7	13.3
South West	12.9	-
Total	9.8	7.5

currently only a small possibly 5% share of the market, will significantly improve retention of iodine. Therefore, SON and NAFDAC have revised the packaging requirement of Food Grade Salt Standard (NIS 168 of 2004) to mandate all salt to be packaged in 250g, 500g or 1 kg consumer packs. Since the bulk of current salt production in Nigeria simply involves repacking bulk shipments of imported salt into 20 kg bags, this regulation will significantly change production processes for most salt companies including addition of capacity for cleaning, drying and iodization – as well as packaging. Therefore, in addition to official notices, a number of consensus building workshops have been convened with the private sector to raise awareness and support. The mutually agreed upon deadline for compliance with this new regulation is February, 2007 after which packaging in large sacks of 20 kg and above "shall become criminal offences." [39]

Improving Coverage in Areas Supplied by Small Village Level Producers

Distribution of Non-Iodized Salt by Zone
From FMOH School Surveys

	2002 Survey	2003 Survey
	% 0 ppm iodine	% 0 ppm iodine
North Central	6.1	4.7
North East		-
North West	1.4	0.5
South East	1.5	4.7
South South	1.4	0.5
South West		1.4
Total	1.7	2

Schools surveys in 2002 and 2005 found roughly 1-2% salt with no iodine added at all, suggesting a remaining challenge in compliance rather than quality assurance. Findings for non-iodized salt were highest, up to 6%, in the North Central Zone which includes Nasarawa and Benue, the two largest small-scale salt producing areas in Nigeria. Ebonyi and Taraba, two other areas with small scale production also showed low coverage of properly iodized salt. In 2004, NAFDAC undertook special activities in these areas of small scale salt processing to determine salt production and consumption patterns.[40] The survey estimated total salt production in these four areas totaled about 18 MT annually – less than 1% of the nation's total edible salt consumption.[41] Within actual salt producing communities, NAFDAC found 97-100% of families consumed non-iodized salt. However, homes, shops and restaurants in surrounding areas indicated 86-100% utilization of iodized salt. Questionnaires determined that while consuming their local processed salt, residents sold excess production mainly to tanners – a widespread industry in these states that uses salt in treatment of hides. While NAFDAC observed that "it will not be proper to campaign against the production of non-iodized local salt because it is a viable means of livelihood in these communities,"[42] to protect these communities from IDD several options are being considered including:

- ✓ Providing communities with small scale iodization facilities along with access to potassium iodate. UNICEF has provided several states with small scale facilities but access to supplies of iodate has proven to be a problem.

- ✓ Providing an alternative market for local salt production. One option is to ensure that 100% of local salt is sold to tanneries for industrial use. Another promising option suggested by local food processors is purchase of all salt production for use in commercial food products while providing packaged iodized salt to the community at subsidized rates.

[39]. This new small packaging requirement significantly changes the business of bulk salt companies. While most salt for human consumption is currently iodized by the exporter with domestic companies simply repackaging bulk shipments, complying with the new regulation will entail cleaning, refining and iodizing as well as re-packaging into the required consumer packs. Simply packaging currently imported bulk salt, with relatively high moisture content, into airtight backs will probably

[40] NAFDAC, Technical Report on Rapid Assessment of the Level of Production, Importation, Marketing and Consumption of Low and/or Non-iodized Salt in Benue, Ebonyi, Nasarawa and Traba States, 2004

[41] While the survey did identify contraband product, presumably smuggled, this represented a smaller share of consumption in these states.

[42] NAFDAC, Technical Report on Rapid Assessment of the Level of Production, Importation, Marketing and Consumption of Low and/or Non-iodized Salt in Benue, Ebonyi, Nasarawa and Traba States, 2004

- ✓ While small scale production continues to present a challenge, the populations involved are defined and limited (estimated at possibly 50 thousand consumers) also offering the opportunity to target other public health measures such as iodine supplement; etc.

Developing a Coordinated and Sustained Nutrition Surveillance System

There are a number of surveys and studies providing distinct data points to evaluate the impact of USI on iodine nutrition in the population.[43] In the fall of 2005, analysis was completed on a UNICEF supported survey including TGR by ultrasound and urinary iodine analysis for more than 12,000 school children. However, these individual projects and data points do not represent a routine ongoing national surveillance system for USI and IDD elimination. While coordination of industrial salt iodization activities is maintained within the current IDD-USI Task Force, mechanisms to coordinate USI with nutrition surveillance as well as with micronutrient interventions in general should be strengthened. Therefore, FMOH CDPA is working on several fronts to strengthen the routine surveillance system.

- ✓ A sentinel site surveillance system established during the 1990's will be strengthened with regular data gathering and reporting requirements to the national level. It is proposed that data collection from these sites be expanded to include urinary iodine as well as current TGR measurements. While in the past, sentinel sites focused on "endemic areas" the proposed re-vitalized system will include a variety of areas to enable monitoring for USI effectiveness and safety.

- ✓ FME has indicated interest in including sub-sampling of school children for urinary iodine in annual school salt quality surveys.

- ✓ Discussions are ongoing with Federal Bureau of Statistics which currently samples for iodized salt in the Nigerian Demographic and Health Survey, to include a sub-sample of urinary iodine.

- ✓ For the medium term, capacity for biochemical analysis will be maintained at the Chemical Pathology Laboratory in the Department of Endocrine Metabolism at University College Hospital in Ibadan. With two spectrophotometers on-line, the lab has capacity to analyze up to 750 samples daily. FMOH and UCH are initiating communications to develop relationships with external reference laboratories.[44] For the long term, as Nigeria's over-all fortification program continues to expand into wheat flour, sugar and oil fortification with a range of micronutrients, FMOH may explore establishing three regional national government labs to support nutrition surveillance.

V. Strengths of Nigeria's USI Program: Why it Works

Industrial and Market Environment

Almost all salt is imported from abroad and enters through four major ports of Lagos, Sapele, Port Harcourt and Calabar. Local packaging and distribution is through a handful of domestic companies. In the mid 1990's, salt was stored and repackaged by 3 companies: Dicon Salt with about 80% market share along with NASCON and New Nigeria Salt.[45] Today, five companies, Dangote Industry/Unilever, Royal Salt, Paterson Zochonis (PZ) Industry, Columbia and Union Dicon Salt Plc, produce 8 brands with an estimated 98% market share.

[43] See Section 1 for review of surveys
[44] Labs under consideration include Medical Research Council at Stellenbosch in South Africa as well as in IDD lab in Accra at the University of Legion, Ghana
[45] Essence of Life, Egbuta, 1993

Changing Salt Industry Market Structure From NAFDAC Surveys 2002-2005				
Manufacturer	**Table Salt Brand**	**Market Share by Year**		
		2002	**2003**	**2005**
Dangote	Dangote Salt	29%	54%	45%
Union Dicon	Union Dicon Salt	27%	15%	9%
Dangote/Unilever	Annapurna			4%
Royal	Uncle Palm Salt	13%	18%	10%
Royal	Royal Salt	1%	10%	19%
PZ	Super Power King	4%	0%	9%
PZ	PZ Salt	2%		
Columbia	Cassava Salt	17%	4%	2%

With this centralized market structure and only an estimated 2% of salt consumption coming from small scale domestic producers or imported from neighboring African countries, the industrial and market environment is very favorable. Mandating iodization and inspecting local producers to ensure they specify and quality assure large scale imports from formal overseas suppliers in Brazil, South Africa, Europe and other exporting nations meet standards is very feasible. In addition to control at the ports, retail and distribution surveys by NAFDAC track changing market shares among brands and salt companies. Open channels of communication with industry and ongoing collection of industry data will enable continued tight regulations and enforcement.

Domestic Financing:

From the inception of the national salt iodization program, the incremental cost of salt iodization in Nigeria has been absorbed by the market place. While it is not possible to gather actual added costs from individual companies, broad estimates are possible. At world market prices for potassium iodate, adding an average of 60-65 ppm - necessary to assure compliance with minimum standard of 50 ppm at factory level - adds about $4/MT to the cost of salt.[46] With estimates for annual national salt consumption at about 240 MT/yr, indicated annual investment in potassium iodate is nearly $1 million annually. [47] While recent budgets for public activities are not currently available, the launch of USI 1993-1995 was achieved with a donor investment of $433 thousand dollars over three years – less than $150 thousand annually during intensive activities for program start-up.[48] Current donor investments in the program are substantially less, with SON, NAFDAC, FMOH and other partners investing significant in-kind and budget resources.[49]

Continuous Improvement Process

Since the original SON standard was revised to specify potassium iodate as opposed to iodide, the standard has been periodically updated and improved. The standard was revised in 1998 to include up-to-date analytical methodologies and more recently in 2004 to mandate distribution

[46] Personal communication, Omar Dary
[47] Consensus Industry estimates from Dangote, Royal and Unilever
[48] Egbuta, Essence of Life, 1993
[49] Specific line item budgets and estimates of in-kind expenditures are not yet available

and sale in small packages to improve retention. Communication with the private sector to improve quality and compliance is consistent. Also in July/August 2004, NAFDAC and SON conducted QC/QA assessment visits to all the salt manufacturing companies, following which a QC/QA workshop was held for Salt manufacturers and regulatory agencies, to share common analytical methodology for iodate determination, later in year 2004. Subsequently, in early 2005 a consultative meeting was held with salt companies to review results and confirm progress. In addition to improving salt quality and iodine retention, Task Force partners are developing systems to address remaining 1-2% gaps in compliance - including small populations consuming village produced salt and findings of batches of contraband product. The goal is 100% access to properly iodized salt.

High Level Commitment

In addition to the Director General of NAFDAC, there is a high level involvement of several agencies in the IDD-USI Task Force, with broad political support comeing from the highest levels. Recent examples include:

- ✓ In 2005, the Honourable Minister for Health, Nigeria opened a workshop to build consensus on the upcoming regulation to migrate the salt industry to small packaging.

- ✓ The then First Lady of Nigeria presented awards at a grand finale of a national secondary school essay contest on USI and IDD elimination.

Private Sector Awareness Support & Collaboration

From the inception of the program, the private sector has been informed, involved and supportive. During the initial phases of the program, according to one report, salt companies "immediately saw the importation of iodized salt as a patriotic responsibility towards the reduction of a rising trend in infant mortality in the country."[50] In 1995, an official from Dicon Salt became an ICCIDD Board Member, made a presentation entitled "How Salt Companies Can Take the Lead in Iodization," which outlined how Nigerian companies became "actively committed to the fight against IDD in the country" as both producers and program partners.[51] Today, as Nigeria's salt industry migrates to smaller packages and higher quality, government officials routinely support new product launches and explore synergies amongst generic and branded promotional campaigns.

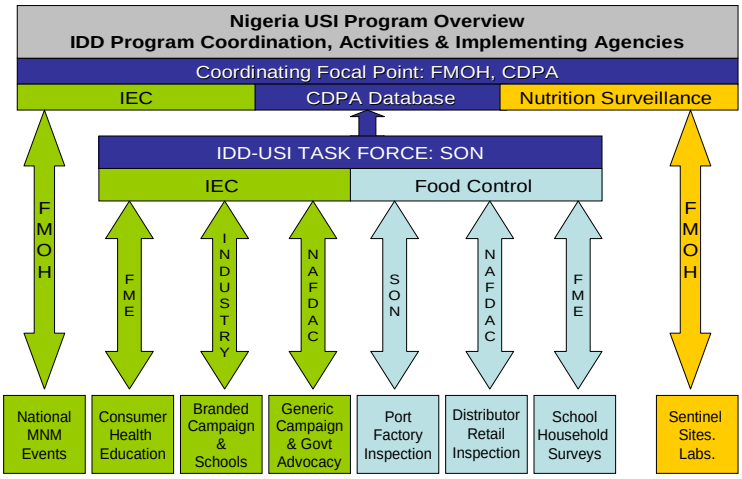
The Emergence of NAFDAC

NAFDAC has developed a high profile image and reputation for protecting the rights of Nigeria's consumers and a reputation for technical competence and integrity. Transparency International recently recognized NAFDAC's Director General (DG) for tackling corrupt practices in the manufacturing, import and export of drugs, cosmetics and food products.[52] The New York Times recently observed that NAFDAC "had broken the back of illicit trade that had flooded Nigeria." [53] USI has become an important issue for the organization - often referred to as "a crusade" in the press. Salt iodization has become an integral component of the agency's comprehensive high profile campaign to assure the Nigerian consumer with quality food and drug products. Within this integrated context, iodized salt is communicated not only as a health issue but as an essential consumer right. Companies not in compliance with salt regulations are sanctioned alongside more high profile reports of adulterated, substandard or dangerous food and drugs. Newspaper headlines identify non-iodized salt as "fake salt" and non-complying companies and brands are listed in official publications of Fake Products.[54] In addition, during a time of decentralization, NAFDAC remains a para-statal agency with direct lines of authority to inspection and enforcement personnel at state

[50] IDD Newsletter Volume 14 Number 3 August 1998, John Egbuta and Nimal Hettiaratchy
[51] Margaret N. Asuquo, ICCIDD Board member, Union Dicon Salt, P.L.C., Lagos, Nigeria, in IDD Newsletter, Volume 11 Number 2 May 1995
[52] Transparency International, the only international non-governmental organization devoted to combating corruption
[53] Sharon LaFraniere The New York Times, July 6, 2005
[54] NAFDAC, Compilation of NAFDAC Published List of Identified Fake Products

and LGA levels and strong outreach to State and local governments. In short, NAFDAC provides a rigorous enforcement context and high profile communications to salt iodization.

VI. Conclusion: Overview of IDD-USI Task Force Activities



Public and private sector partners in the IDD-USI Task Force have defined complementary roles and responsibilities, built human and technical capacity, developed internal systems and opened multi sector reporting channels necessary to consistently and continuously implement and monitor USI. The commitment and capacity is in place to capture changes in production and consumption, and to identify trends that may impact the effectiveness, safety, and sustainability of USI. Recognition by a global body concerned with IDD control and USI, will provide additional political and advocacy leverage to sustain and institutionalize the achievements of Task Force partners. Considering the reported successes and ongoing efforts of USI in Nigeria, some global stakeholders assert that "it is difficult to concur that household access to iodized salt is at the elevated levels reported.[55] The preponderance of the evidence suggests otherwise.

[55] Kiwanis International Update 2005: Vol 21, No 1, FEBRUARY 2005

Appendix 1:

USI Program Assessment: Recommendations

1. Documenting Impact Indicators

Need for operational and ongoing national system to collect total goitre rate (TGR) and/or Median Urinary Iodine (MUI). Theoretically, where endemic areas exist, there would be need for the Federal Ministry of Health (FMOH), Nutrition Division, to track TGR and/or MUI via sentinel sites in the endemic areas and retrospective data from this system should be available and reporting from the sites functioning on a routine basis. This should be a routine ongoing national surveillance system for IDD elimination. Other recommendations for FMOH-Nutrition Division, the coordinating division, would include:

- Operationalize the Sentinel Site system where they exist, with annual data collection of TGR and MUI. In addition, it may be useful to reconstruct and compile records retrospectively, if possible.

- Expand FMOH Sentinel Site system not only in current endemic areas but also: a.) areas showing low salt coverage to assist in monitoring over-all USI program and b.) in areas indicating high coverage to provide insights into potential high intake of iodine via salt. This need not include a large amount of samples but only sufficient to establish trend data and "trouble shoot." As issues arise, more samples and analysis can be collected as deemed necessary.

- It should be noted that TGR rates may be confounded by wide consumption of cassava – a powerful goitrogen. Therefore, urinary iodine should be considered as an indicator in FMOH Sentinel Site system. When this system is functioning it may no longer be necessary to collect TGR. In addition, urinary iodine data should be regularly collected from school children. During annual salt quality monitoring exercise at primary schools involving sampled children, a sub-sample could be devoted to collecting UI. If resources are scarce, this need not be annual but possibly collected every two years. In addition, initiate dialogue with the National Bureau of Statistics (NBS) to include a sub-sample of UI collection in the Demographic and Health Survey as a sub-sample of current household salt survey.

- For the short and medium term, a relationship with a reference laboratory or a Laboratory capable of analysing urinary iodine level should be established for lab analysis of urine with spectrophotometer. This need not be a government lab, but must be currently functioning reasonably well and FMOH medium term commitment to this lab will be to provide capacity for analysis of samples taken from sentinel sites or from DHS. This will also sustain and expand capacity in this laboratory. While for the long term, developing capacity of government labs, in line with WAHO/CDC recommendation to develop regional labs, may be pursued, for the medium term, the relationship with any available iodine laboratory should be strengthened.

- Relationship with an independent reference laboratory should be established. Options include Medical Research Council in South Africa (which functions as a reference laboratory for ECSA countries) or possibly the CDC approved reference laboratory in Ghana.[56]

[56] Currently, 42 laboratories in 31 countries, including Ghana, participate in the EQUIP program COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (CSIR-GH.), FOOD RESEARCH INSTITUTE, (MICROBIOLOGY DIVISION - M4), P. O. BOX M20, ACCRA, GHANA.

2. Documenting Process Indicators

The current system of annual surveys and compilations is functioning well via the IDD-USI Task Force with the regulatory agencies[57] (Standard Bureau and Food and Drugs Dept) and Federal Ministry of Education (FME) taking lead roles. Recommendations include:

- Compile budgets and dedication of staff and in-kind resources to better document prospects for long-term sustainability of this system based on domestic and government resources and with a minimum of external donor support and technical assistance. Domestic financing of iodine field-test kits (procure through UNICEF) will be an inexpensive yet high profile approach to indicating domestic financing.

- Expand scope of annual household salt surveys currently coordinated by FME and implemented by State Universal Basic Education Boards (SUBEB). Given the support demonstrated by FME and SUBEB, it should be feasible to a.) include a sub-sample of urinary iodine from school children and b.) Include health educational and promotional component for IDD and iodized salt.

- A database should be instituted for more regular reporting of inspections at factory level by the Standard Bureau including results and ranges of titration analysis. Retrospective records from 1999 (or period long enough to show a trend) to date should be compiled.

- Records from Port Inspection Directorate may be incomplete and these seem not to be routinely reported to IDD Task Force. Since almost all salt is imported this is critical to: a) obtain true and continuous record of the size of the total market for human consumption and b) establish how much imported salt is for animal versus industrial use. This data will also provide market share data for the various domestic salt importers/packagers/refiners and will supplement the brand (and non-branded) market share data collected by the NAFDAC at the retail and distributor level.

3. Sustainability Indicators:

- ***Has National USI Law or iodized salt Regulation been enacted?***

Relevant questions would include: when was salt iodisation first mandated? Has the standard been regularly updated, improved or revised? What were the revisions e.g. moving from potassium iodide to iodate; updating methods of analysis to conform to ICCIDD recommendations; migrating sales of all salt for human consumption to small packages within two years. Is the standard clear, specifications widely communicated and what is the compliance level by industry? Is there any special waiver to iodisation i.e. exception to industrial salt or salt meant for animal consumption.

- ***Is Regular Salt Iodine Data collected at factory, retail & household***?

Is there any form of IDD or USI taskforce in place? If Yes, what are their roles in monitoring distinct segments of the market. If No, who coordinates or implements data collection or collation at all levels and how is this sustained on a continuous basis? The system of salt collection from primary school students as proxy for household availability – together with current survey by DHS – should be an effective system to continuously define household access to properly iodized salt; is this done? Other recommendations include:

  - ✓ Reporting from factory level inspections should more clearly indicate internal quality control data from the involved companies. While this may be included in

[57] In Nigeria, the regulatory agencies are the Standards Organisation of Nigeria (SON) and the National Agency for Food and Drug Administration and Control (NAFDAC).

other channels of reporting – such as product registration or GMP compliance – and factory internal quality control data, it should be integrated into annual reporting of the IDD-USI Task Force.

✓ It should be recognized that small packaging will significantly change the business of bulk salt companies. Currently most salt for human consumption is iodized by the exporter and domestic companies simply repackage. What percent of the market is in-country refined and packaged salt? However, packaging in-country in small pack sizes (250gm, 500gm, 1kg) will entail that the companies actually refine and iodize as well as package.[58] They will become salt "factories" in the true sense of the word. This may require technical assistance and vigilant oversight.

✓ It should also be noted that when small packaging objective is achieved, salt will essentially be iodized twice if the current standard and production system remains intact – once by the overseas bulk salt supplier and again by the domestic salt producer who must iodize after centrifuging (cleaning and drying salt, essentially washing out all the iodine). As this new packaging system develops, an amendment to the standards may be considered for iodine content in salt at the point of import. However, this should proceed only when compliance is well established for the new packaging requirement.

- ***National multi-sector coalition with clear coordination point and a National Officer to ensure ongoing compilation of USI and IDD data base***

There is need to ensure a multi-sectoral representation on the IDD-USI Task Force, with an efficient Secretariat, preferably at the Standard Bureau (as in the case of Nigeria, and which functions well). However, the coordination function of FMOH (Nutrition Division) should be clear. Other recommendations would include:

✓ Clarify lines of responsibility between IDD-USI Task Force coordinated by the Standard Bureau and reporting to FMOH-Nutrition Division. The former title 'IDD Task Force' could monitor the elimination of IDD, which is a more health surveillance related function; while the USI taskforce could have its activities related strictly to overseeing the USI intervention. The title IDD-USI Taskforce, as adopted by Nigeria, would be more appropriate. Therefore, the roles and responsibility for FMOH to coordinate and integrate health surveillance data need to be more clearly defined, supported and reinforced. In addition, at the FMOH level, the relationship to National Fortification Alliance (NFA) for over-all fortification program (be it Vitamin A, iodine, iron, etc) should be clarified and strengthened. It is recommended that the next Task Force review meeting consider a name to reflect a focus on the implementation of USI under coordination of the Standard Bureau while the term IDD is connected to the more comprehensive umbrella of Micronutrient Deficiency Control Task Force coordinated by FMOH.

✓ There is need for an updated national database. This database should include updated statistics on: salt industry and market, MUI and/or TGR data and include summary and evaluation of all partner activities. This could be integrated into FMOH's ongoing Nutrition Information System – along with a comprehensive set of nutrition indicators. Possibly, program status might be reported annually during National Micronutrient Day Activities.

✓ A national coordinator within FMOH, devoting a significant proportion of time to USI and IDD elimination should be clearly designated. This should be a single focal

[58] Simply packaging currently imported bulk salt, with relatively high moisture content, into airtight bags will probably mean condensation and leaching out of iodine inside the package.

point empowered within the organization and provide with sufficient resources to: a.) actively oversee FMOH collection and analysis of nutrition surveillance data b.) Integrate nutrition surveillance data with USI data supplied by the IDD-USI Task Force; c.) and to provide a year by year over-view of program status and population iodine nutrition trends; d.) Propose and plan regular program reviews. It is suggested that the coordinator be at a Deputy Director level to enable open and frank communications with all partners.

- ***Continuous and Strategic Advocacy and Public Education***

Advocacy, promotion and public education, should be via the regulatory agencies (since they set and enforce the standards) and private sector (like Unilever is doing in Nigeria and Ghana) and should be well documented. FMOH national advocacy activities, workshops, Micronutrient Day should be regularly implemented. Other recommendations would include:

- ✓ FMOH should develop plan to include IDD education and iodized salt promotion as part of nutrition education activities delivered via FMOH infrastructure to communities and health centers.

- ✓ An educational activity should be developed for implementation along with annual salt testing in primary schools. Generic materials have been developed in a number of countries and could be cost-efficiently adapted for the country. For long term sustainability, there should be an opportunity to insert IDD and USI as health and consumer education elements in the school curriculum. Also, there may be an opportunity to coordinate generic education/promotion with the private sector's (as done by Unilever) branded program which plans to reach selected majority of Nigeria's school children over a given period of years.

- ✓ Long term strategic communications plan with objectives along with roles and responsibilities of implementing organizations both in public and private sector should be developed. As part of this activity, an evaluation of communication past activities should be undertaken to assess consumer attitudes, knowledge of IDD and USI, recognition of logo and importance of iodized salt and recall of communications messages.

- ***Financial Sustainability***

With the salt industry and marketplace bearing the costs of iodization (roughly estimated at $1 million annually in Nigeria), the foundation of sustainability has been established. However, investments in the financial sustainability of public sector activities such as food control, nutrition surveillance and public education and communication activities need to be clearly demonstrated.
Other recommendations include:

- ✓ Meeting of implementing partners, UNICEF and other Development Partners to establish how much is currently being invested by national public agencies vs. donors. This should include both in-cash and in-kind costs to the regulatory agencies, FMOH, FME and other public partners.

- ✓ Line item budgets to finance public agency activities should be clearly defined.

- ✓ Long term financing plan for public agency functions should be developed. Where additional financial and technical assistance is necessary, budgets should be developed and migration to domestic financing within a set period of time should be defined.

Appendix 2:

Overview of Roles and Responsibilities of Key Implementing Partners
FMOH (through the CDPA Department) ▪ Coordination Point for Para-statal Agencies (SON and NAFDAC), and other line Ministries (Education, Industry, Agriculture, Women Affairs, etc). ▪ Monitoring of Sentinel Sites ▪ Supervision of Biochemical Evaluations ▪ Development of National USI Data base
SON ▪ Maintaining and Revising Standards ▪ Factory and Port Level Inspection at least bi-annually (performance-based). ▪ Secretariat for Task Force (convenes quarterly review meetings and collate/consolidate reports). ▪ Lab Capacity for quantitative product testing
NAFDAC ▪ Food Regulation and Enforcement at Distributor and Retail Levels ▪ Annual and ad hoc Surveys and Compilation of Data from distributor and retail levels. ▪ Trouble Shooting in Low Coverage Areas and States ▪ Government Advocacy at Federal, State and LGA level ▪ Generic Consumer Education Campaigns ▪ Network of Food Analysis Labs
FME ▪ Coordination of State Basic Education Board's for proxy household sampling via school children ▪ Integration of urinary iodine into school activity ▪ Integrating education activities and reforming curriculum ▪ Collaborations with private sector health promotions
INDUSTRY ▪ Compliance with Regulation ▪ Internal Quality Assurance ▪ Branded Marketing and collaboration with public agencies in health education
DONORS (UNICEF, Kiwanis Int'l, Micronutrient Initiative, etc). ▪ Technical support for training and capacity building on USI. ▪ Financial support (procurement and distribution of test kits to partners).