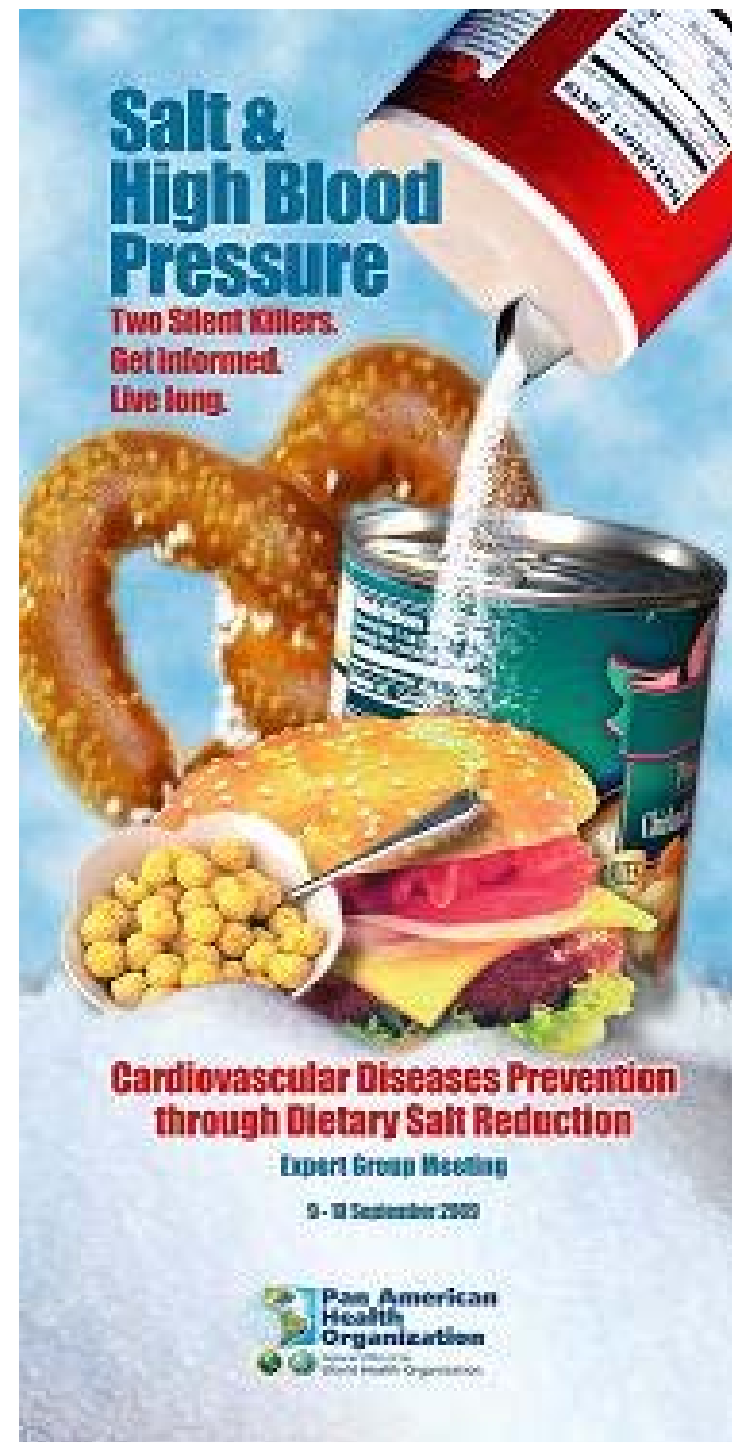


Cardiovascular Disease Prevention through Dietary Salt Reduction

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Salt as a Vehicle to Prevent Iodine Deficiency Disorders in the Region of the Americas

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Cardiovascular Disease Prevention Through Dietary Salt Reduction

Contents

- Iodine deficiency disorders: Causes and consequences.
- Iodine nutritional status in the LAC region.
- Overview of the national programs to prevent iodine deficiencies.
- Setting new iodine fortification levels to comply with recommendations to reduce salt intake
- Conclusion

Iodine Deficiency Disorders

Causes

- Lack of iodine in natural food.

Consequences

- Birth defects
- Increased risk for abortions and stillbirths
- Retarded physical growth
- Impaired mental functioning
- Cretinism
- Hypothyroidism
- Goiter

Table 1.1 *The spectrum of IDD across the life-span*

Fetus	Abortions Stillbirths Congenital anomalies Increased perinatal mortality Endemic cretinism Deaf mutism
Neonate	Neonatal goitre Neonatal hypothyroidism Endemic mental retardation Increased susceptibility of the thyroid gland to nuclear radiation
Child and adolescent	Goitre (Subclinical) hypothyroidism (Subclinical) hyperthyroidism Impaired mental function Retarded physical development Increased susceptibility of the thyroid gland to nuclear radiation
Adult	Goitre, with its complications Hypothyroidism Impaired mental function Spontaneous hyperthyroidism in the elderly Iodine-induced hyperthyroidism Increased susceptibility of the thyroid gland to nuclear radiation

Source: Adapted with permission of the publisher, from Hetzel (2), Laurberg et al. (3) Stanbury et al. (4).

Iodine deficiency is the major cause of preventable mental retardation.

Strategies to Increase the Iodine Intake

Prevalence

- Worldwide 2 billion people have insufficient iodine intake through the usual diet.
- In the Americas region 98 million people may suffer from insufficient iodine intake if additional supply is not ensured.

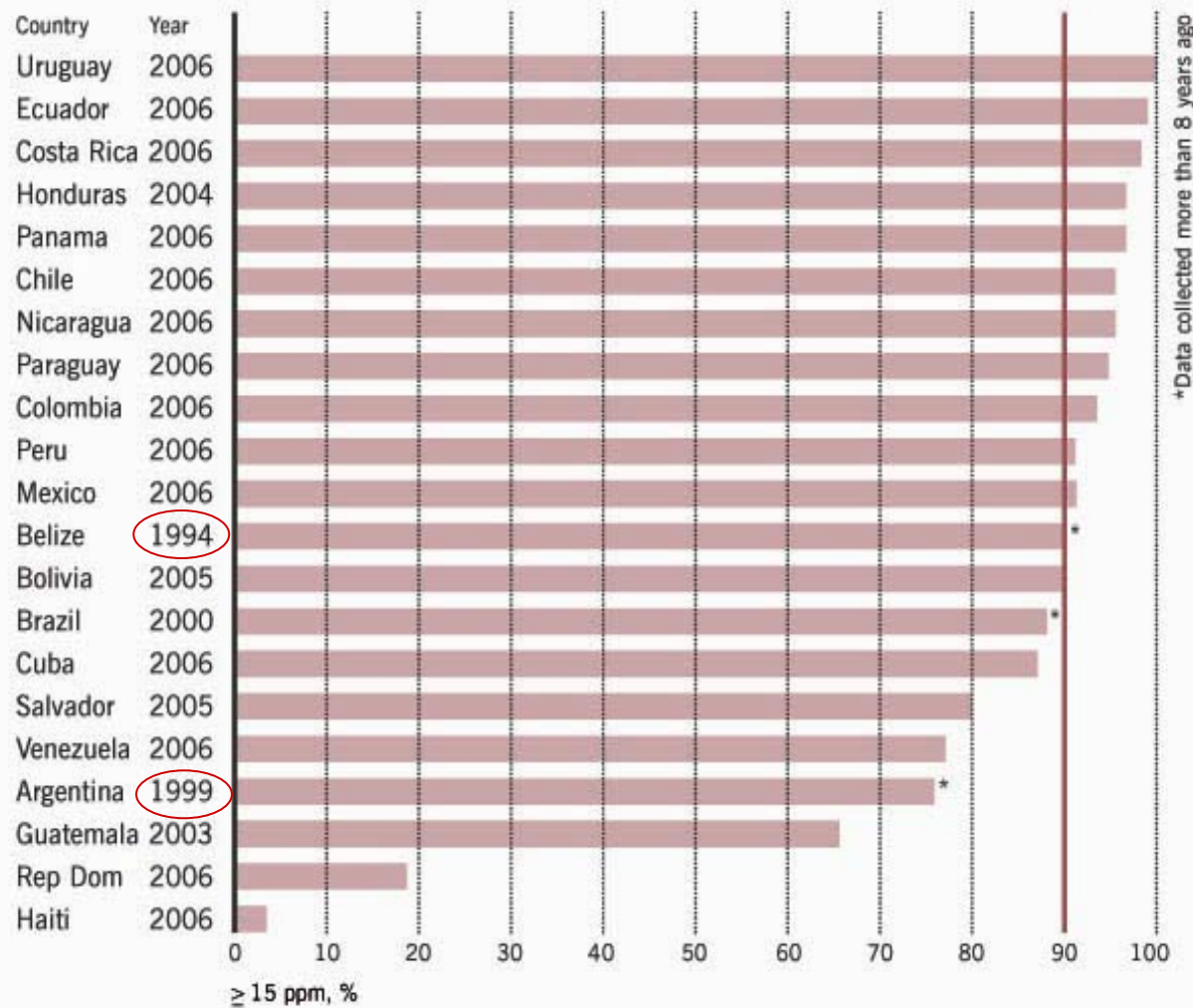
Prevention Strategies

- Food Fortification
 - Salt Iodization
 - Bread
 - Water
 - Oil
 - Milk
 - Wheat flour
- Iodine Supplementation

Salt iodization is the most cost effective intervention to prevent iodine deficiency disorders

% salt iodized (≥ 15 ppm) at retail/household level

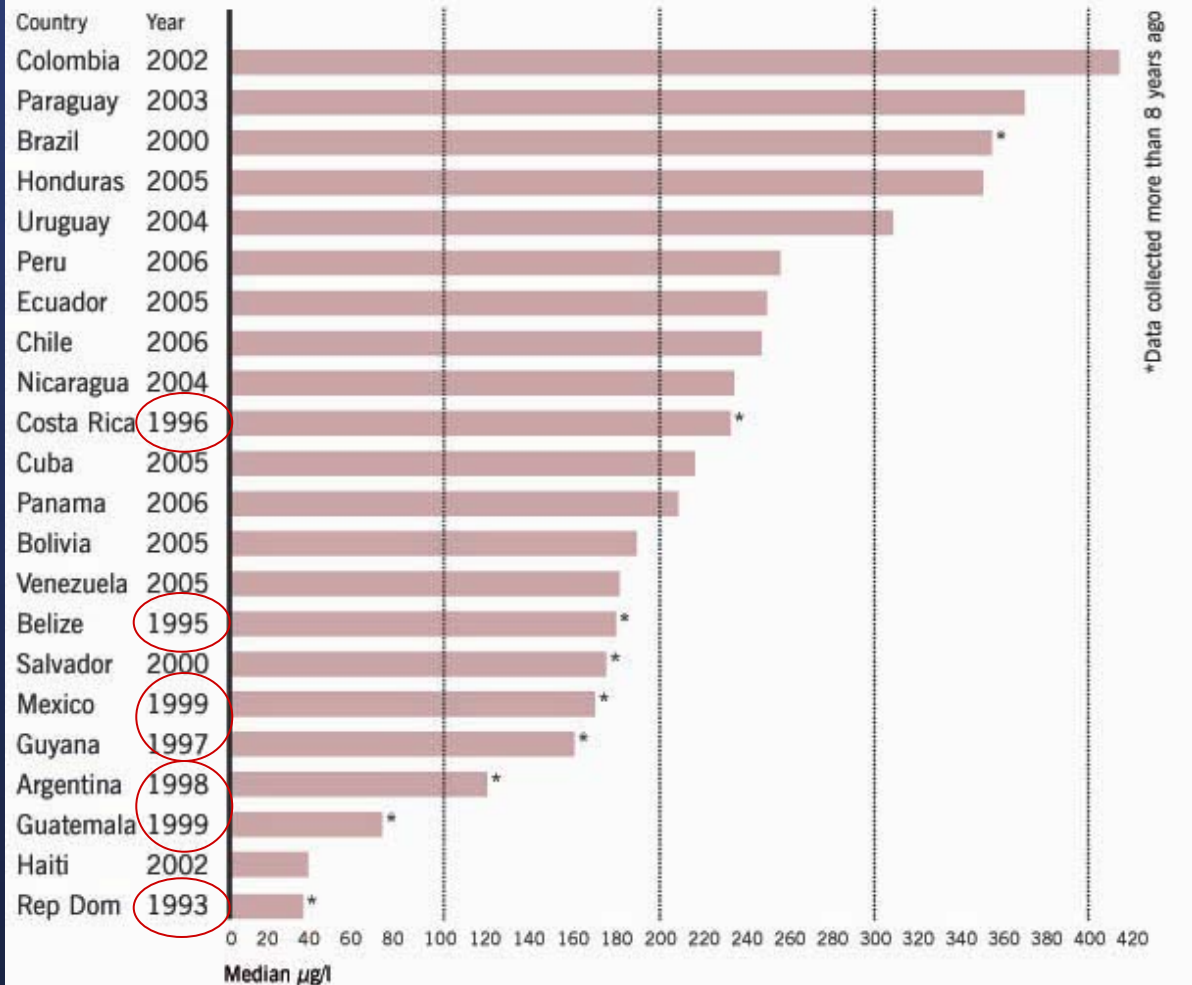
Fig. 1: Iodine content in salt at retail/household level



Source: Pretell, E. Grajeda, R. Iodine Nutrition in Latin America. IDD Newsletter 2009, 31;(1):1-5

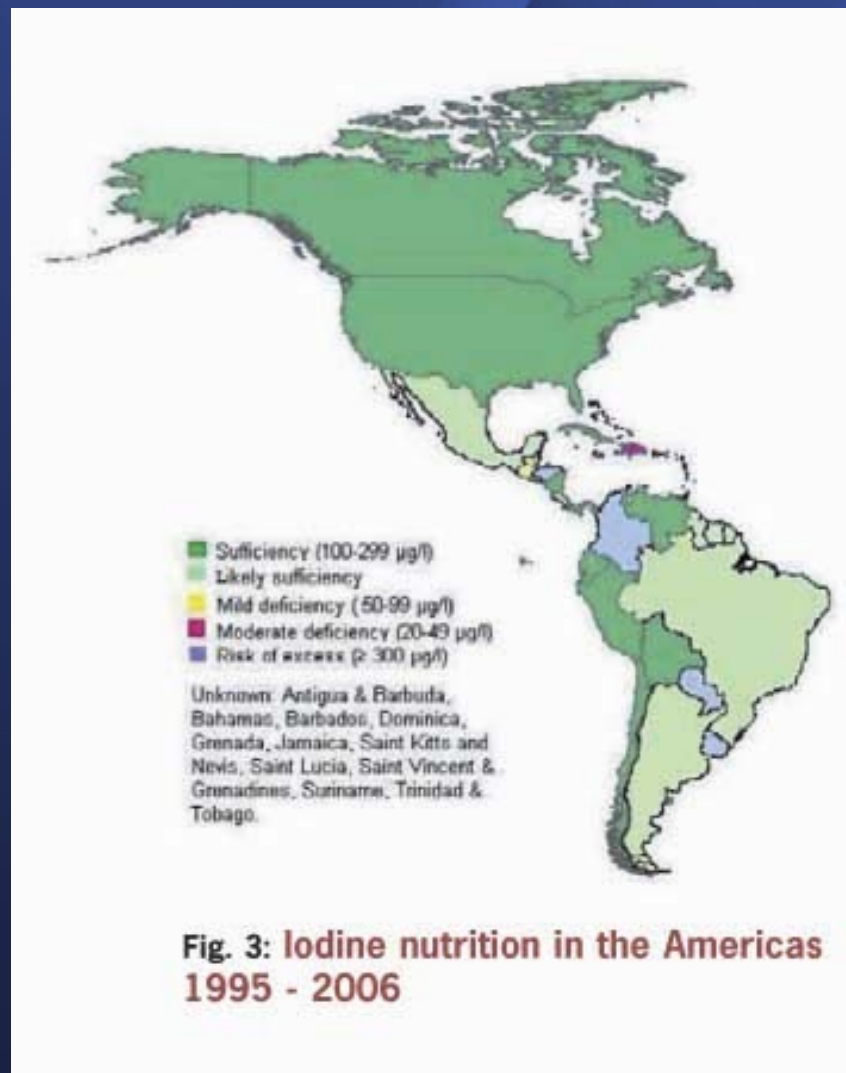
Urinary Iodine Excretion in School Age Children

Fig. 2: Urinary Iodine



Source: Pretell, E. Grajeda, R. Iodine Nutrition in Latin America. IDD Newsletter 2009, 31;(1):1-5

Iodine Nutrition in the Americas 1995-2006



Source: Pretell, E. Grajeda, R. Iodine Nutrition in Latin America. IDD Newsletter 2009, 31;(1):1-5

Food Fortification Program Design

Why salt

- Universally consumed.
- Consumed at approximately the same level throughout the year.
- Iodine addition does not change salt color, taste or odor.
- Production is limited to a few centers in most countries.
- Iodine addition is a simple operational procedure.
- The equipment required is uncomplicated, easy to operate and maintain.
- Iodization has a low cost (US\$0.005 to 0.020)

Long term history of Salt Iodization

From 1941 to 1994

North America

Countries	Legislation
Canada	1949
Unite States	1925
México	1963
Central America	
Belize	2007
Costa Rica	1961
El Salvador	1961
Honduras	1960
Guatemala	1954
Nicaragua	1968
Panamá	1955

South America

Countries	Legislation
Argentina	1967
Bolivia	1968
Brazil	1953
Chile	1953
Colombia	1959
Ecuador	1968
Paraguay	1958
Peru	1940
Uruguay	1953
Venezuela	1966

Caribbean

Countries	Legislation
Antigua and Barbuda	
Bahamas	
Barbados	
Cuba	1990
Dominican Republic	1994
Dominica	
Grenada	
Guyana	
Haiti	¿?
Jamaica	¿?
Saint Kitts And Nevis	
Saint Lucia	
St. Vincent & Grenadines	
Suriname	
Trinidad and Tobago	

Current Regulatory Parameters by Country

North America

Countries	Regulatory Parameter (mgs/Kg)
Canada	100
United States	100 ?
México	20 - 40

Central America

Belize	20 -60
Costa Rica	33 – 50
El Salvador	30 - 100
Honduras	50 - 100
Guatemala	20 – 60
Nicaragua	30 - 60
Panamá	50 - 100

South America

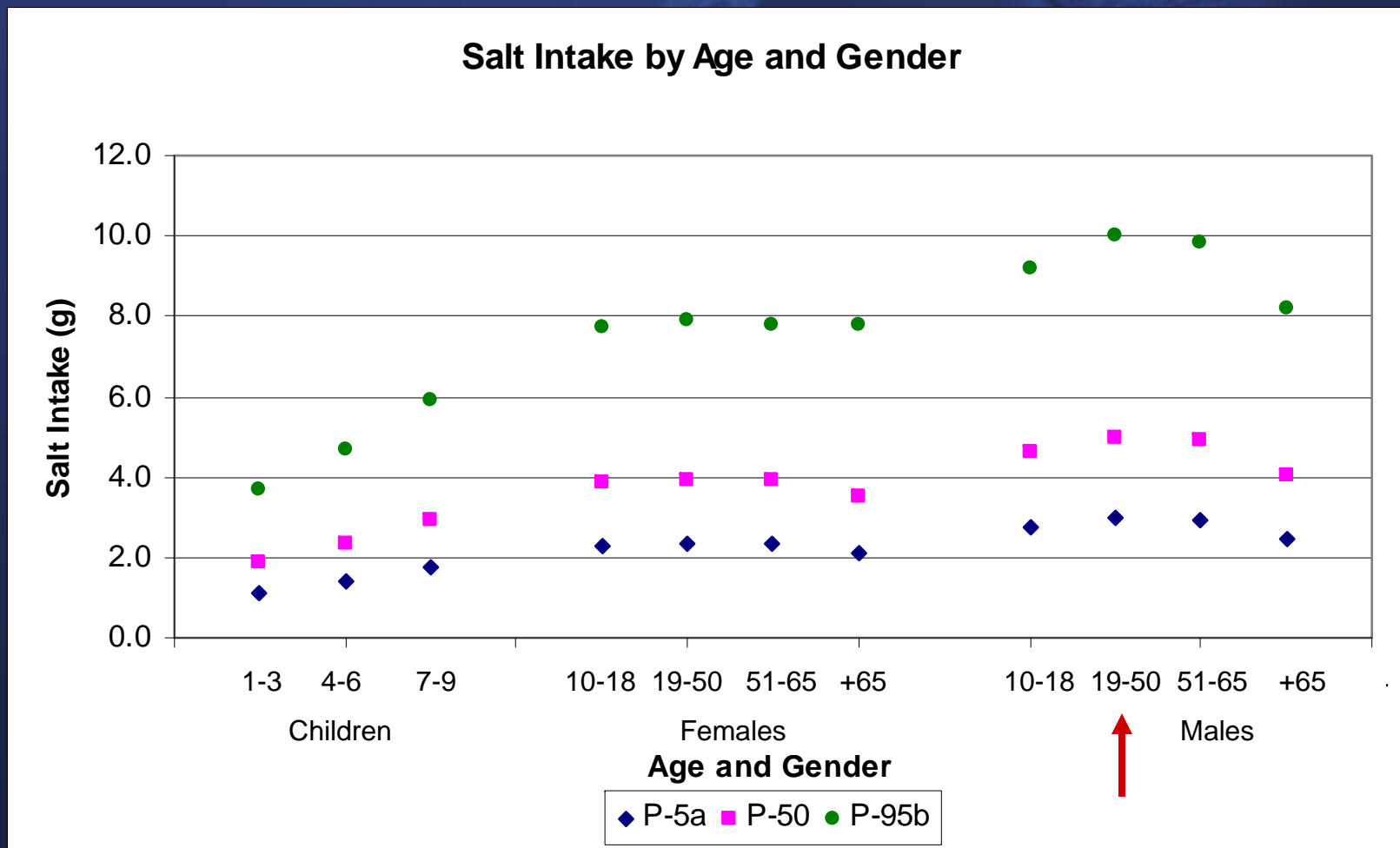
Countries	Regulatory Parameters (mgs/Kg)
Argentina	32 - 38
Bolivia	40 - 80
Brazil	20 - 60
Chile	20 - 60
Colombia	50 - 100
Ecuador	30 - 50
Paraguay	40 - 60
Peru	30 - 40
Uruguay	30 50
Venezuela	40 - 70

Caribbean

Countries	Regulatory Parameters (mgs/Kg)
Antigua and Barbuda	
Bahamas	
Barbados	
Cuba	18 - 23
Dominican Republic	30 - 100
Dominica	
Grenada	
Guyana	
Haiti	20 - 40
Jamaica	¿ ?
Saint Kitts And Nevis	
Saint Lucia	
St. Vincent & Grenadines	
Suriname	
Trinidad and Tobago	

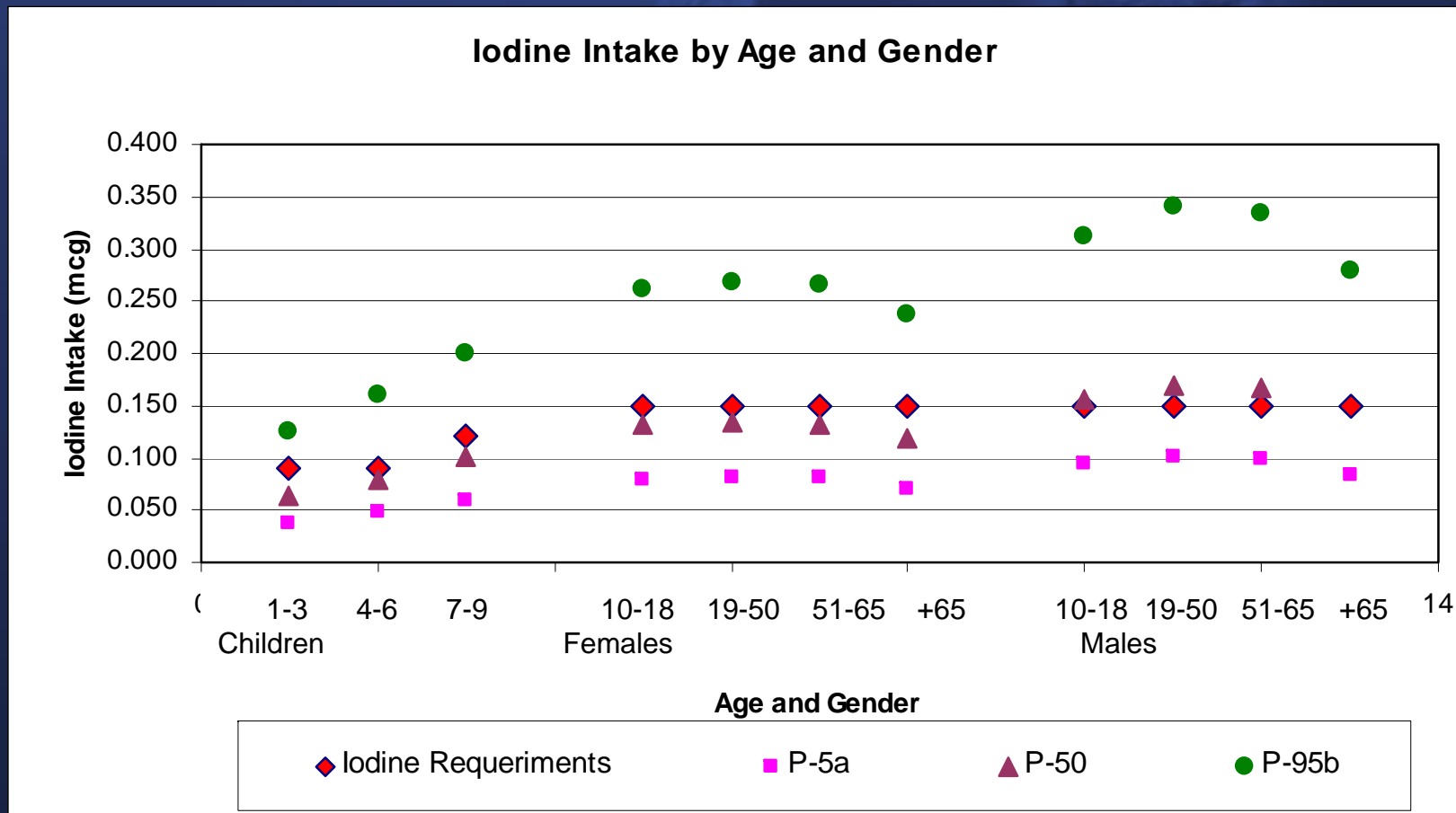
Hypothetical Distribution of Salt Intake by Age and Gender

Average salt intake for a male 19 – 50 years = 5 g adjusted by adult male caloric intake, age and gender



Hypothetical Distribution of Iodine Intake Adjusted by Adult Male Caloric Intake, Age and Gender

Average salt intake for 19 – 50 male = 5 g
Salt fortification level fixed at 40 mg of iodine / Kg of salt



It provides 95% of the EAR in the population group with the low salt intake

Suggested iodine fortification levels to comply with recommendations to reduce salt intake

Salt consumption Male 19 – 59 year old	Min 3.0 g/day	Average 5.0 g/day	Max 10.0 g/day
Recommended nutritional intake (RNI)	150 mcg/day		
Suggested Iodine Addition levels	40 mg/Kg		
Production parameters	Min 30 mg/kg	Average 40 mg/kg	Max 50 mg/kg
Regulatory parameters	27 mg/kg		50 mg/kg

Conclusions and Recommendations

- Most of the countries in the Americas Region has Salt Iodization programs in place. Inter agency efforts should be done to update the situation in the Caribbean countries
- The iodine deficiency is mild to moderate in the Americas Region. Countries of special interest are:
 - Guatemala, Haiti and Dominican Republic.
- In some countries iodine intake is to high that iodine additions levels and salt consumption must be reviewed and adjusted appropriately.
 - Colombia, Paraguay, Brazil, Honduras and Uruguay.

Conclusions and Recommendations

- The iodine level could be modulated accordingly to salt intake. However before promote any changes in national regulations, current regulatory parameters, salt intake, and salt sources should be reviewed together urinary iodine excretion.
- Program monitoring and evaluation will help to mobilize political and financial support for long term program sustainability
- Lack or weak of program monitoring and evaluation systems, limited the opportunity to report every three years as requested by the WHA and to review and adjust the norms and regulations.
- Iodine supplementation is a feasible intervention to achieve those without access to iodized salt.



Thank you