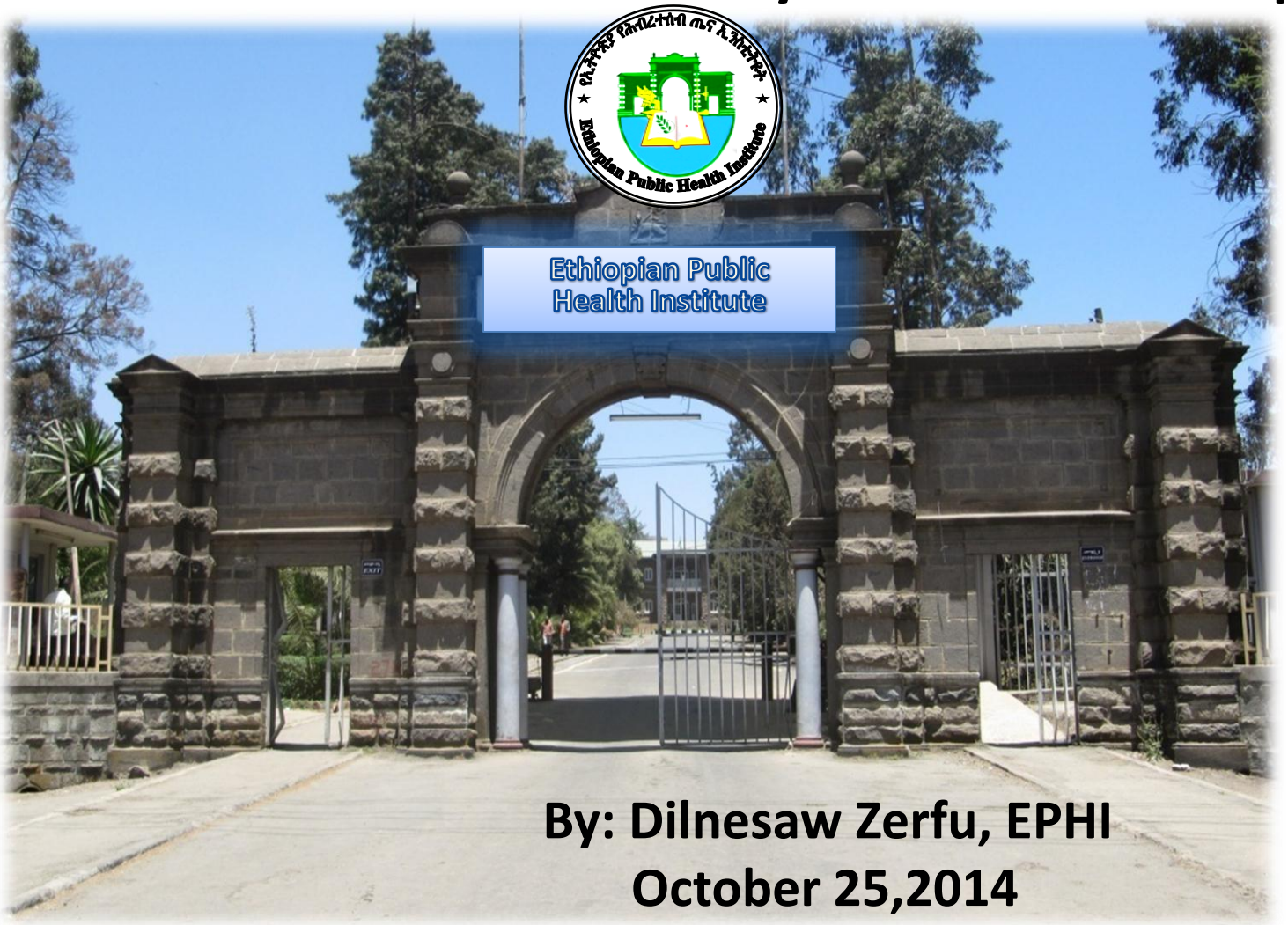
National salt iodization coverage towards Prevention of Iodine Deficiency Disorder in Ethiopia



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Background

- According to WHO, IDD is among the major public health problems of the world, particularly of **pregnant** and **young women and Children**
- Low level of thyroid hormones in the body due to lack of adequate iodine in foods and drinks is responsible for IDD
- More than 2 billion people, most of them in developing countries, suffer from inadequate intake of iodine.

Background

- In Ethiopia IDD has been recognized as a public health problem for many decades.
- According to the 2005NMS, total goiter rate was 40% and 35.8% in school-age children and their mother respectively.
- EDHS 2011, estimated that about 66 million persons in Ethiopia were “unprotected from iodine deficiency” as only 15 % of households had access to iodized salt.

Background

What are the Consequences of Iodine Deficiency Disorder?

- Affects body growth and mental development leading to learning disability
- Irreversible mental retardation, Reduce school performance
- Weakness and morbidity in adults, Poor productivity
- Mortality, Unemployment and discounting future earnings



Background

Why salt iodization?

- Convenient vehicle and easy to mix
- Consumed by all
- USI can lead to increase the average intelligence of the entire school age population by 13 points

Background

Challenges and progress of USI in Ethiopia

- In Ethiopia salt iodization was started in 1980s
- Ethiopia was one of the first countries in Sub-Saharan Africa close to achieving USI
- Due to the Ethio-Eritrean war iodization was not maintained
- To meet the needs of the population Iodated salt was imported for a short time
- The high cost of importation, local production sites were explored

Background…

- Local production of non-iodized salt has been started, accounted for 90 to 95% salt need of the country
- Resulted in rapid deterioration of iodine status
- Iodization was then revitalized in 2004
- Accordingly small scale salt iodization was started in Afar region

Background…

- But, progress was very slow due to factors including:
  - ✓ The harsh weather (>45 ^{0} C) in all production sites
  - ✓ low production capacity and less robust iodization machines,
  - ✓ lack of infrastructure (water and electricity)
  - ✓ lack of commitment by salt producers to iodize,
  - ✓ lack of a clear strategy to enforce the salt legislation.

Background…

- The Council of Ministers passed new salt legislation in February 2011
- Since January 2012, the government started enforcing the legislation
- Iodization progressively increased,
- However quality still remained a challenge

Objective

- ✓ To assess iodated salt coverage by semi qualitative method using rapid test kit (RTK), gold standard Iodometric titration and trained over time.

Methodology

Study design:

- Community base cross-sectional survey was conducted,
- 50 enumerators, 25 supervisors and 12 RC
- About 20g of salt sample was collected.
- Two types of analysis was applied
  - ✓ RTK, on the field
  - ✓ Iodometric titration (Gold standard),

Methodology…

- The sampling frame for assessment was drawn from list of CSA enumeration areas
- EAs were consisted of 150 to 250 households in rural and urban houses as a measure of size.

Sample size

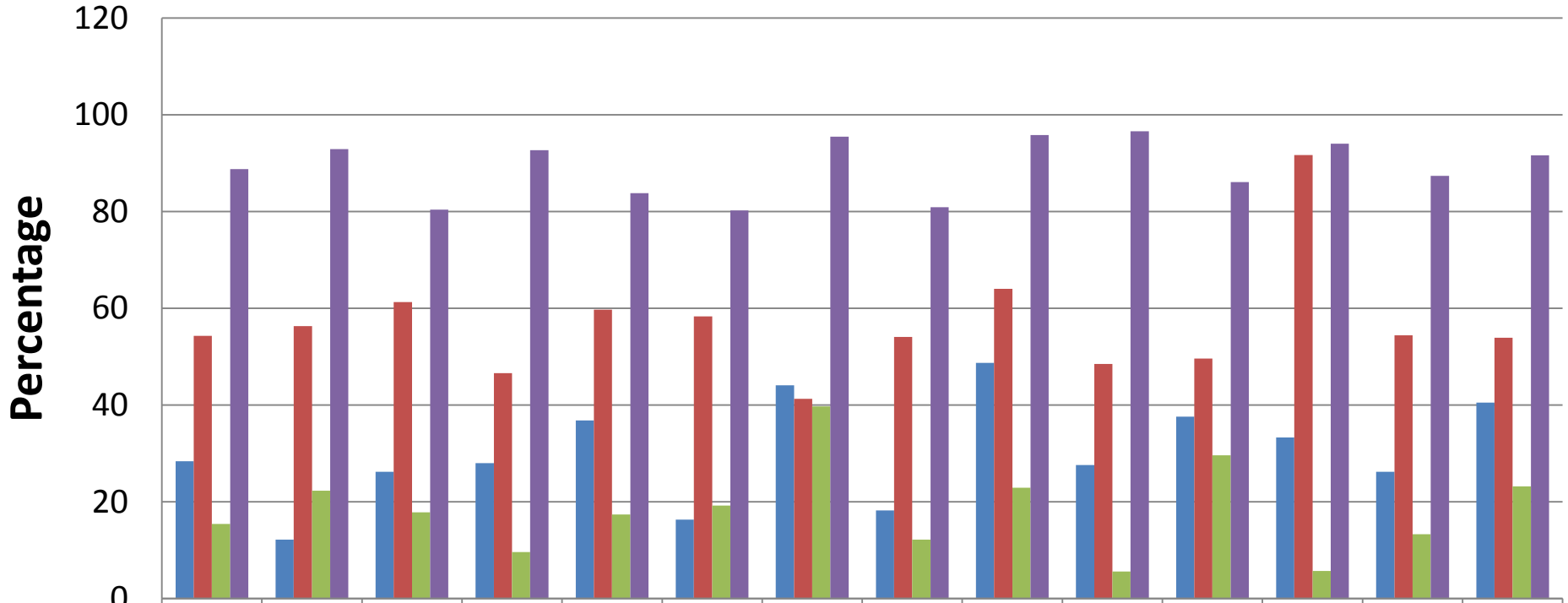
- 10% HH in each EA
- N= 5605 (at national level)

Result and Discussion

Iodated salt coverage by region, ENMS 2014, RTK

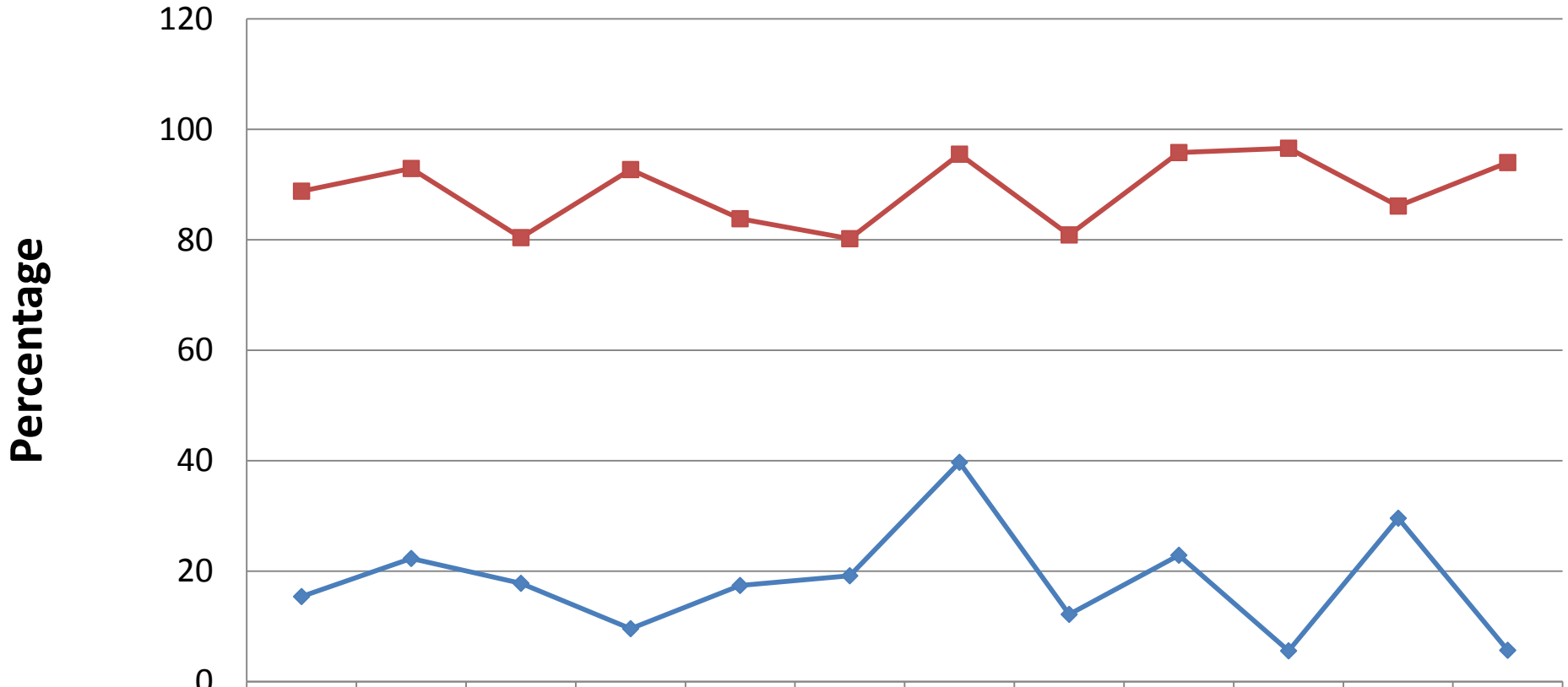
Regions	RTK				
	N	0 ppm	<15 ppm	>15 ppm	Coverage (+ RTK)
National	5605	11.20%	34.90%	53.90%	88.80%
Tigray	661	7.10%	24.40%	68.50%	92.90%
Afar	388	19.60%	43.30%	37.10%	80.40%
Amhara	707	7.40%	40.20%	52.50%	92.70%
Oromia	740	16.20%	41.90%	41.90%	83.80%
Somali	319	19.70%	19.10%	61.10%	80.20%
BG	427	4.40%	28.80%	66.70%	95.50%
SNNP	711	19.10%	53.90%	27.00%	80.90%
Gambela	332	4.20%	31.60%	64.20%	95.80%
Hareri	436	3.40%	28.00%	68.60%	96.60%
AA	456	13.80%	23.20%	62.90%	86.10%
DD	466	6.00%	30.90%	63.10%	94.00%

Household Iodated salt coverage from 2000 to 2014 in Ethiopia by region



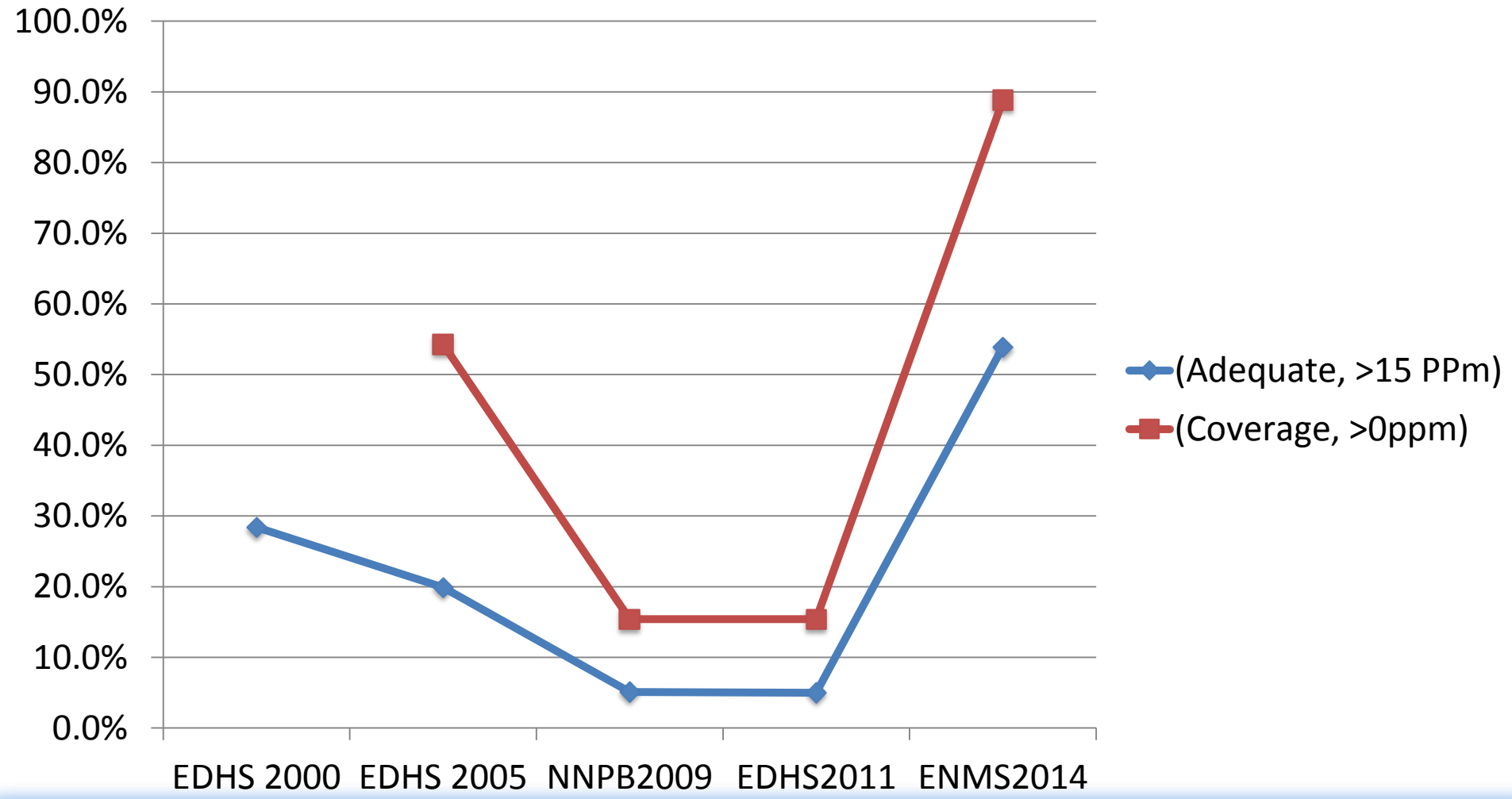
	National	Tigray	Afar	Amhara	Oromiya	Somali	BG	SNNPR	Gambela	Harai	AA	DD	RURAL	URBAN
EDHS 2000	28.4	12.2	26.2	28	36.8	16.3	44.1	18.2	48.7	27.6	37.6	33.3	26.2	40.5
EDHS 2005	54.3	56.3	61.3	46.6	59.7	58.3	41.3	54.1	64	48.5	49.6	91.7	54.4	53.9
EDHS 2011	15.4	22.3	17.8	9.6	17.4	19.2	39.7	12.2	22.9	5.6	29.6	5.7	13.3	23.2
ENMS2014	88.8	92.9	80.4	92.7	83.8	80.2	95.5	80.9	95.8	96.6	86.1	94	87.4	91.62

Iodated salt coverage 2011 Vs 2014



	National	Tigray	Afar	Amhara	Oromiya	Somali	BG	SNNPR	Gambela	Harai	AA	DD
EDHS 2011	15.4	22.3	17.8	9.6	17.4	19.2	39.7	12.2	22.9	5.6	29.6	5.7
ENMS2014	88.8	92.9	80.4	92.7	83.8	80.2	95.5	80.9	95.8	96.6	86.1	94

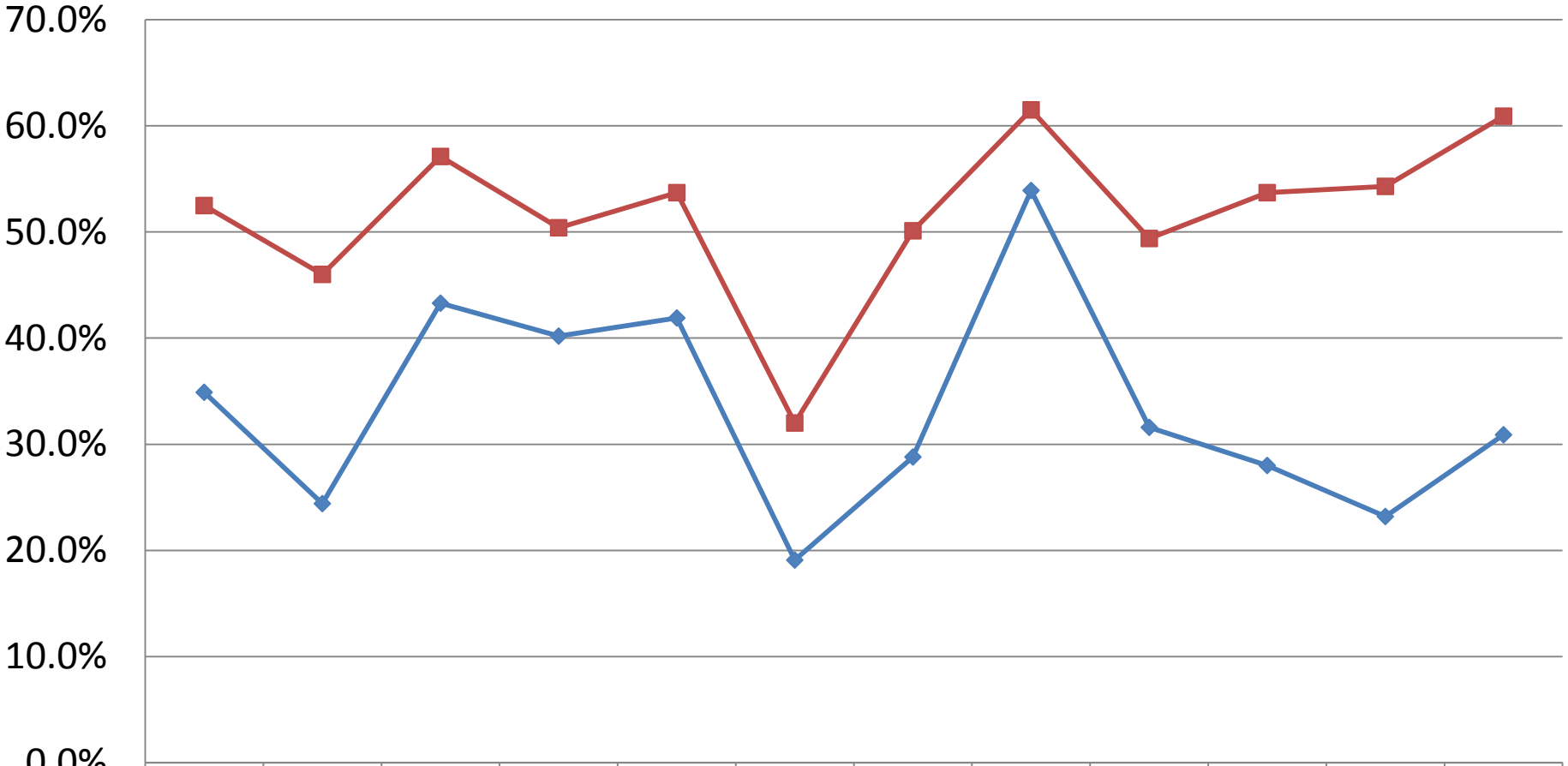
Coverage Vs Adequacy



Validation of RTK with Titration (Gold standard)

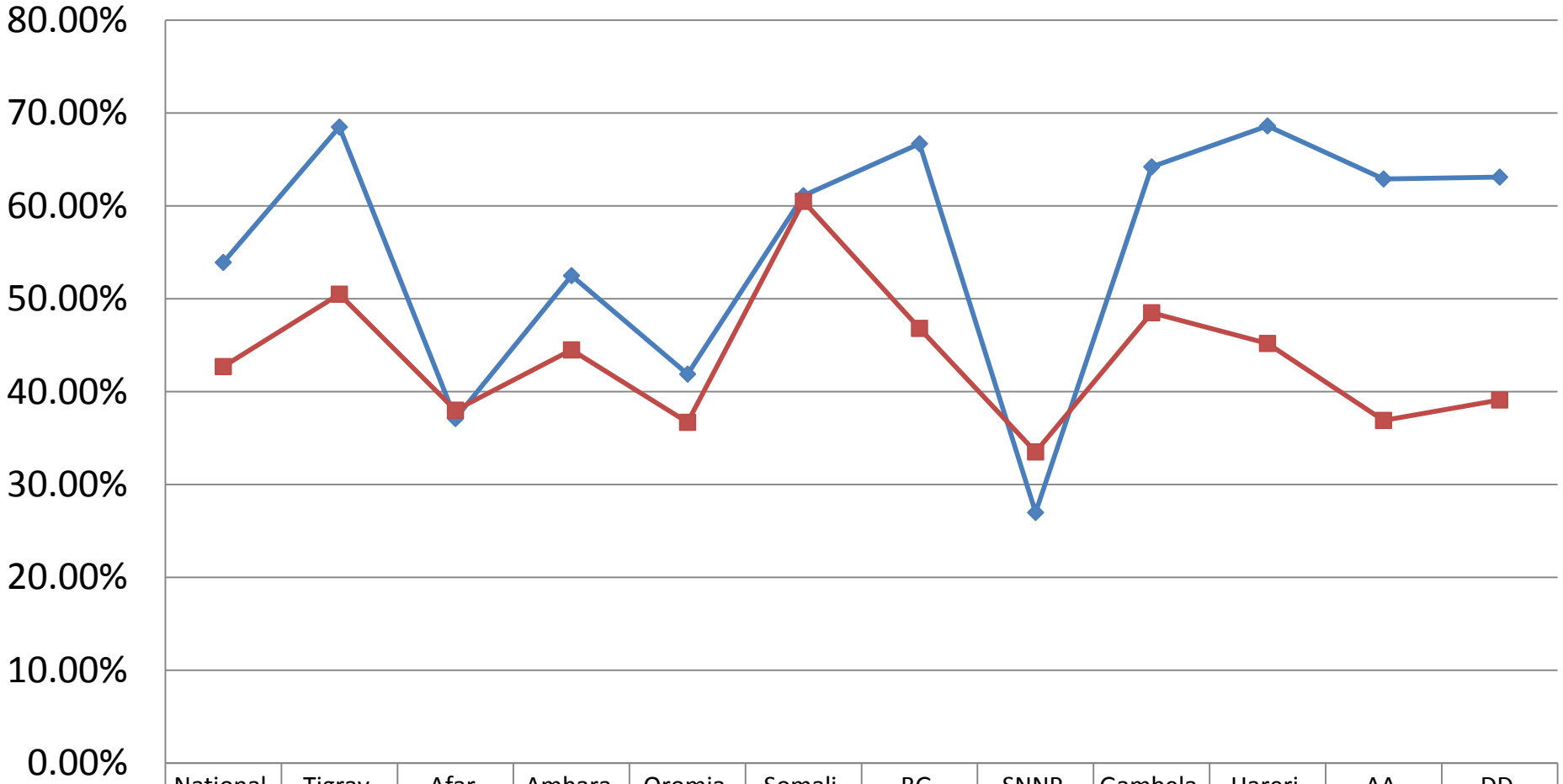
	RTK			Titration value		
Regions	0 ppm	1-15 ppm	>15 ppm	0 ppm	1-15 ppm	>15 ppm
National	11.2%	34.9%	53.9%	4.8%	52.5%	42.7%
Tigray	7.1%	24.4%	68.5%	3.5%	46.0%	50.5%
Afar	19.6%	43.3%	37.1%	4.9%	57.1%	38.0%
Amhara	7.4%	40.2%	52.5%	5.1%	50.4%	44.5%
Oromia	16.2%	41.9%	41.9%	9.6%	53.7%	36.7%
Somali	19.7%	19.1%	61.1%	7.5%	32.0%	60.5%
BG	4.4%	28.8%	66.7%	3.0%	50.1%	46.8%
SNNP	19.1%	53.9%	27.0%	4.9%	61.5%	33.5%
Gambela	4.2%	31.6%	64.2%	2.1%	49.4%	48.5%
Hareri	3.4%	28.0%	68.6%	1.1%	53.7%	45.2%
AA	13.8%	23.2%	62.9%	8.8%	54.3%	36.9%
DD	6.0%	30.9%	63.1%	.0%	60.9%	39.1%

Less than 15ppm, RTK Vs Titration



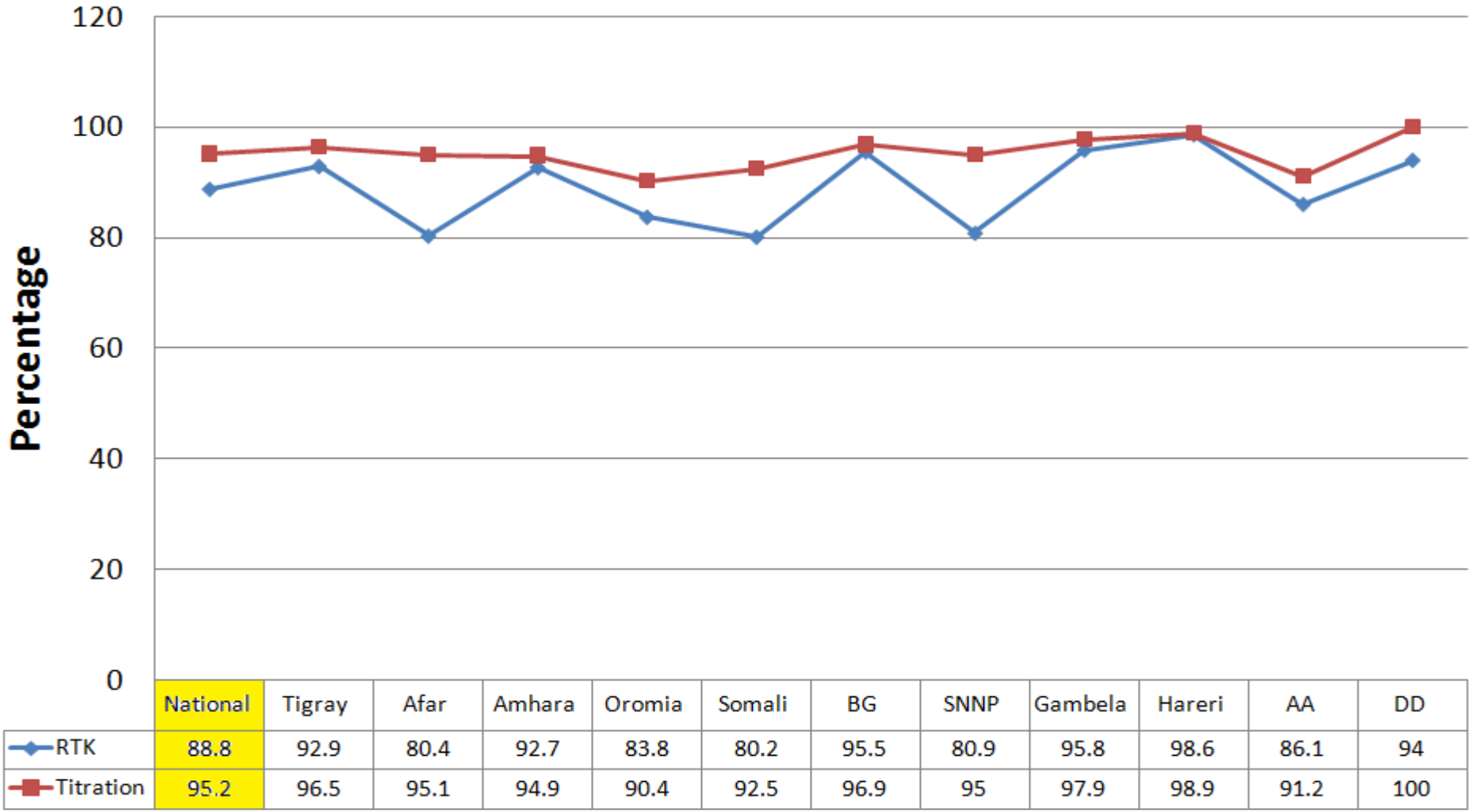
	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	Hareri	AA	DD
RTK	34.9%	24.4%	43.3%	40.2%	41.9%	19.1%	28.8%	53.9%	31.6%	28.0%	23.2%	30.9%
Titration	52.5%	46.0%	57.1%	50.4%	53.7%	32.0%	50.1%	61.5%	49.4%	53.7%	54.3%	60.9%

Greater than 15 ppm, RTK Vs Titration



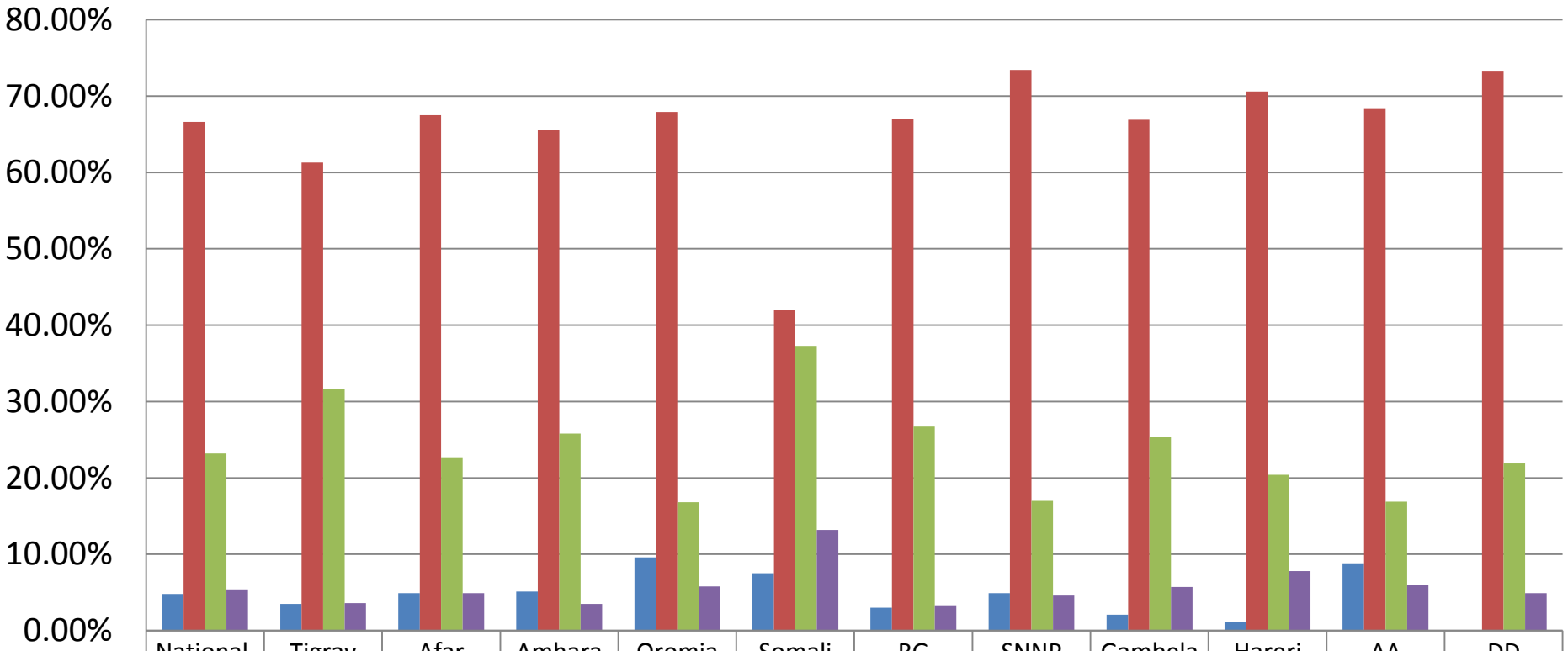
	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	Hareri	AA	DD
RTK	53.90%	68.50%	37.10%	52.50%	41.90%	61.10%	66.70%	27.00%	64.20%	68.60%	62.90%	63.10%
Titration	42.70%	50.50%	38.00%	44.50%	36.70%	60.50%	46.80%	33.50%	48.50%	45.20%	36.90%	39.10%

Coverage, RTK Vs Titration



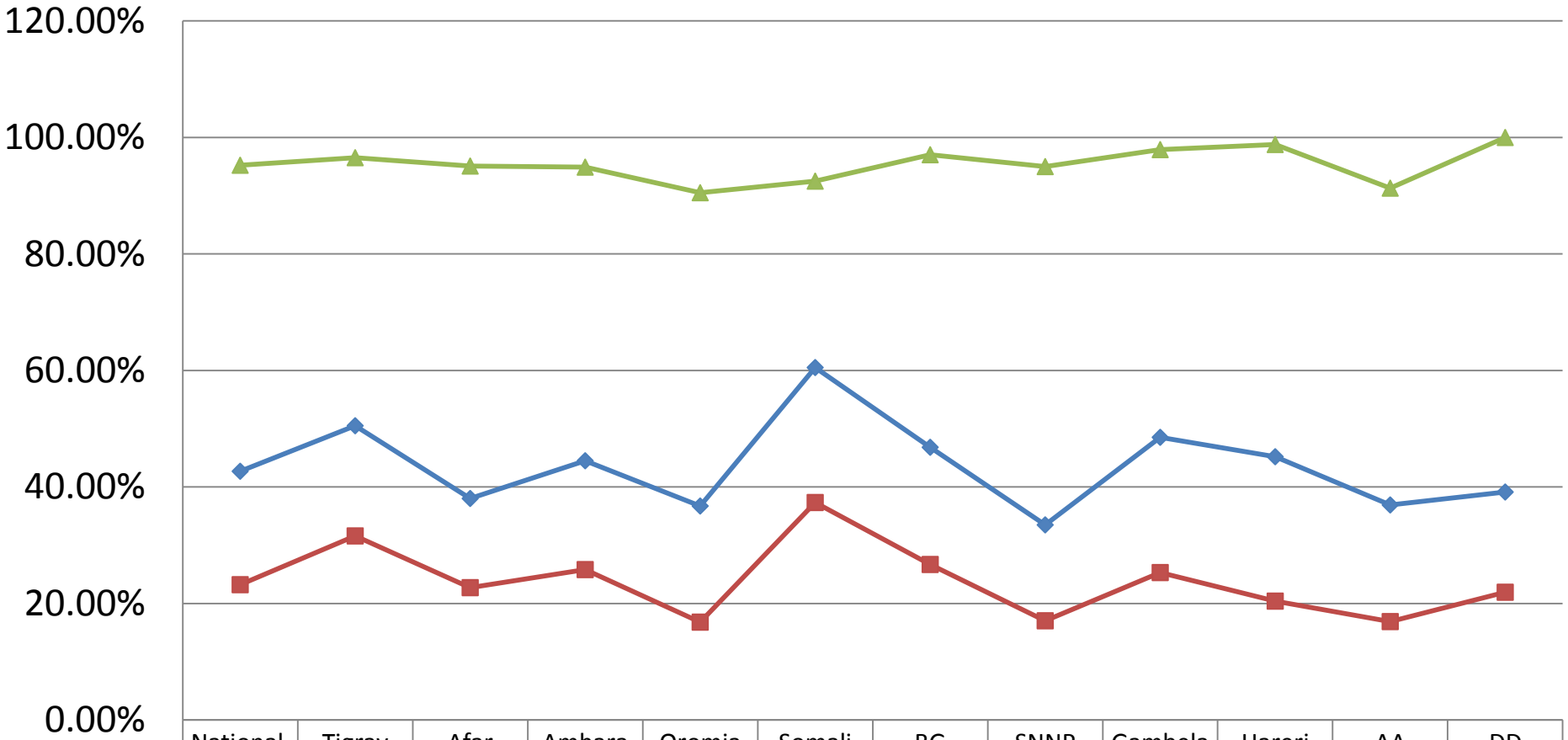
	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	Hareri	AA	DD
RTK	88.8	92.9	80.4	92.7	83.8	80.2	95.5	80.9	95.8	98.6	86.1	94
Titration	95.2	96.5	95.1	94.9	90.4	92.5	96.9	95	97.9	98.9	91.2	100

Iodated salt coverage Vs Ethiopian standard



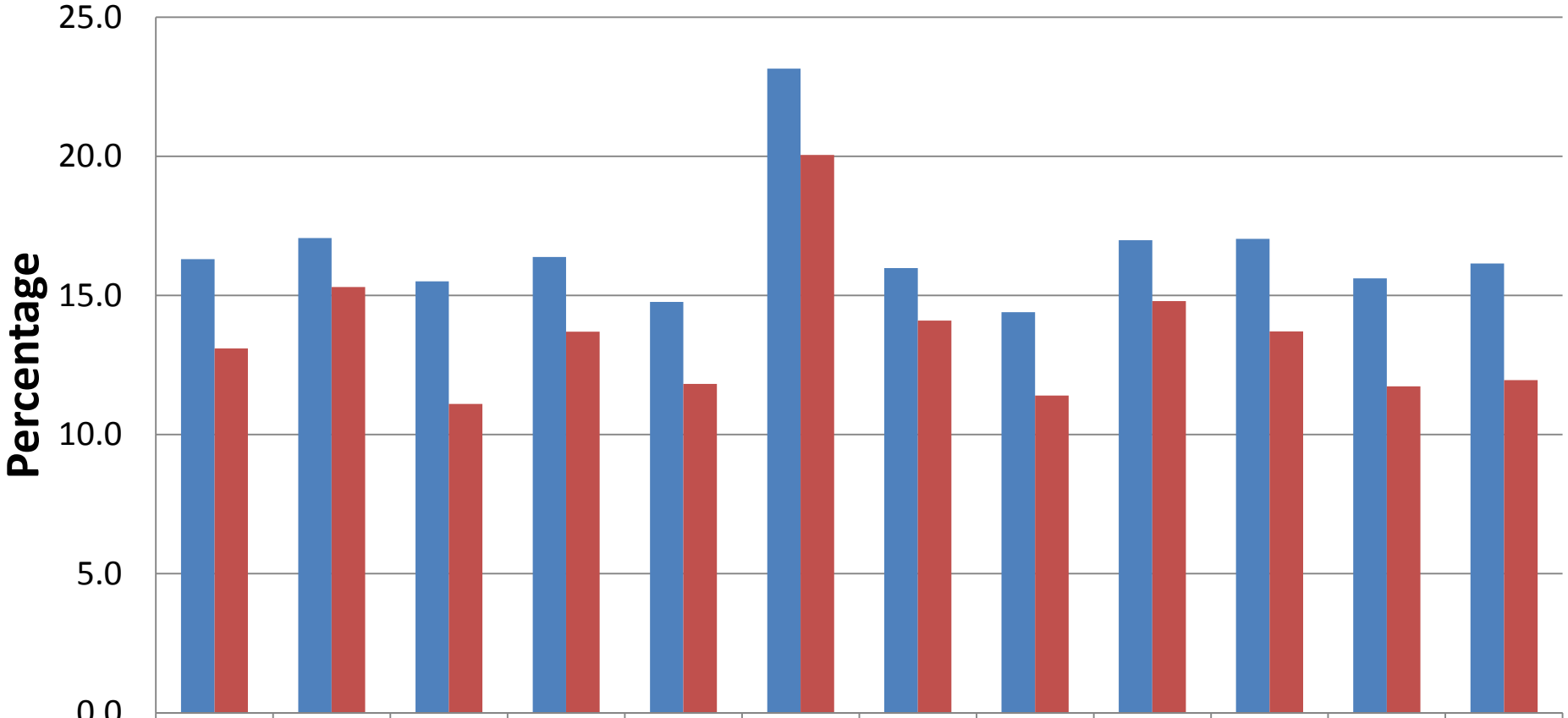
	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	Hareri	AA	DD
below 1	4.80%	3.50%	4.90%	5.10%	9.60%	7.50%	3.00%	4.90%	2.10%	1.10%	8.80%	0.00%
1-19.99	66.60%	61.30%	67.50%	65.60%	67.90%	42.00%	67.00%	73.40%	66.90%	70.60%	68.40%	73.20%
20-40	23.20%	31.60%	22.70%	25.80%	16.80%	37.30%	26.70%	17.00%	25.30%	20.40%	16.90%	21.90%
above 40	5.40%	3.60%	4.90%	3.50%	5.80%	13.20%	3.30%	4.60%	5.70%	7.80%	6.00%	4.90%

Titration, Adequacy Vs Coverage



	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	Hareri	AA	DD
> 15 ppm	42.70%	50.50%	38.00%	44.50%	36.70%	60.50%	46.80%	33.50%	48.50%	45.20%	36.90%	39.10%
20-40ppm	23.20%	31.60%	22.70%	25.80%	16.80%	37.30%	26.70%	17.00%	25.30%	20.40%	16.90%	21.90%
coverage	95.20%	96.50%	95.10%	94.90%	90.50%	92.50%	97.00%	95.00%	97.90%	98.80%	91.30%	100.00%

Mean and Median salt iodine content (ppm) by Region, ENMS2014



	National	Tigray	Afar	Amhara	Oromia	Somali	BG	SNNP	Gambela	HAreri	AA	DD
Mean	16.3	17.1	15.5	16.4	14.8	23.2	16.0	14.4	17.0	17.0	15.6	16.2
Median	13.1	15.3	11.1	13.7	11.8	20.1	14.1	11.4	14.8	13.7	11.7	12.0

Conclusion

- As the current assessment shows coverage and access to iodated salt in Ethiopian has exhibited a remarkable change
- This is an outstanding achievement for the government of Ethiopia, to all partners working in nutrition and other stakeholders
- RTK can be primary used in field studies, when a large number of salt samples need to be analyzed in a population

Conclusion…

- However the coverage of iodated salt at national level seen as 88.8% and 94.4% by RTK and iodometric titration respectively, but adequacy (20 ppm to 40ppm) was reported only 23.20%

Conclusion…

- More efforts are needed to improve the iodated salt quality (Impurities and iodine content) to successfully implement and achieve USI to prevent IDD in Ethiopia

Recommendation

- Maintain the coverage and increase access for safe and adequately iodated salt at household level
- Government should strengthen the salt legislation enforcement
- Iodization technique shall be transformed from small scale to Industrial scale
- Create sustainable potassium iodate supply system
- Strengthen monitoring and evaluation of the USI program

The Ethiopian Public Health Institute

The Ethiopian Public Health Institute