Flawed approach in the GBD 2010 for iodine deficiency compromises its findings

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The Global Burden of Disease 2010 was an ambitious effort to describe the global distribution and causes of a wide array of major diseases, injuries, and health risk factors. The results show that infectious diseases, maternal and child illness, and malnutrition now cause fewer deaths and less illness than they did twenty years ago. Full reports were in the Lancet in December 2012 (*http://www.thelancet.com/themed/global-burden-of-disease*). Additional interactive data available at: *http://www.healthmetricsandevaluation.org.*

From 1990 to 2010, there was remarkable progress against IDD worldwide. Global household coverage of iodized salt increased from <20% to 70% and the number of iodine-deficient countries was sharply reduced from 110 in 1993 to 32 in 2012 (2).

Despite this, the GDB 2010 reports a 23% increase in global DALYs (disability-adjusted life years) due to iodine deficiency between 1990 and 2010!

The reason for this discrepancy is that the approach used to define the 2010 GBD due to iodine deficiency (1) contains major errors.

- First and foremost, prevalence estimates for all disability in 2010 were derived from grade 2 (visible) goiter rates in the WHO Vitamin and Mineral Nutrition Information System (VMNIS). This was done despite the fact that WHO, ICCIDD and the VMNIS have been using urinary iodine concentrations to define IDD prevalence for a decade. Nearly all the goiter data used in the GBD is far out-of-date and irrelevant in 2010.
- In addition, the only IDD impact on mental impairment was cretinism; rates of cretinism were estimated based on Grade 2

Figure 1: **The proportion of years living with disability (YLD)s attributable to iodine deficiency in 2010.**
http://www.healthmetricsandevaluation.org

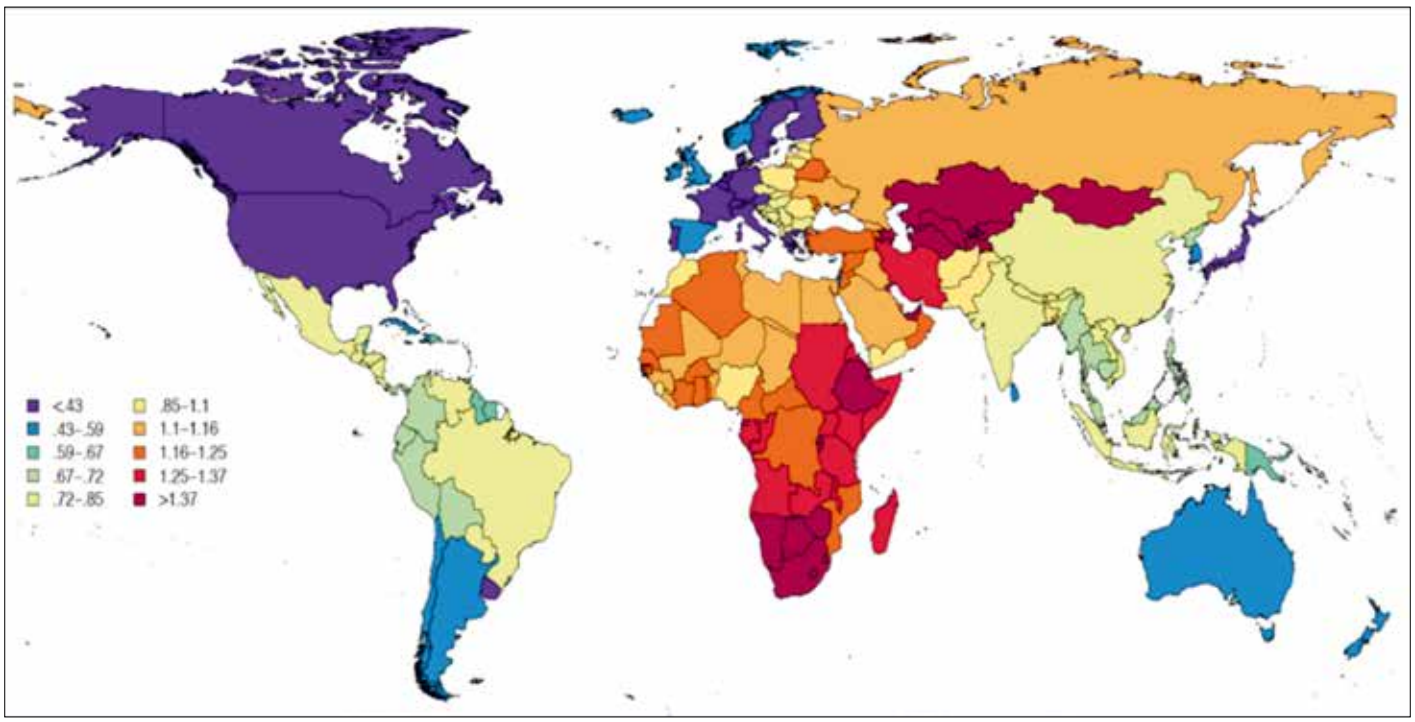

Table 1: Global DALYs (disability-adjusted life years) in 1990 and 2010 for all ages, both sexes combined, and per 100,000 and percentage change, for nutritional deficiencies, including iodine deficiency

	All ages DALYs (thousands)			DALYs (per 100 000)		
	1990	2010	%Δ	1990	2010	%Δ
Iodine deficiency	**3273**	**4027**	**+23.0**	**62**	**58**	**–5.3**
Vitamin A deficiency	740	806	9·0	14	12	–16.1
Protein-energy malnutrition	60 543	34 874	–42.4	1142	506	–55.7
Iron-deficiency anemia	46 792	45338	–3.1	883	658	–25.4
All nutritional deficiencies	111 787	85 341	–23.7	2109	1239	–41.3

Table 2: Ranking of iodine deficiency, global and regional, DALYs (disability-adjusted life years) and YLDs (years living with disability) in 2010 for all ages, both sexes combined, and school age children (10-14 y), both sexes. Ranking in the top 30 indicated in red font.

	All ages		School age children	
	DALYs	YLDs	DALYs	YLDs
Global	**85**	**42**	**46**	**28**
South Asia	79	33	50	22
East Asia	97	59	53	38
Southeast Asia	92	51	51	33
High-income Asia Pacific	104	66	47	39
Australasia	91	53	41	35
Oceania	75	31	38	23
Central Asia	52	23	19	11
Western Europe	85	45	30	27
Central Europe	76	37	29	23
Eastern Europe	76	36	28	19
North Africa and Middle East	50	23	26	16
Southern sub-Saharan Africa	51	24	25	16
Eastern sub-Saharan Africa	65	29	29	19
Central sub-Saharan Africa	43	15	21	11
Western sub-Saharan Africa	78	38	40	28
Southern Latin America	127	79	66	47
Tropical Latin America	100	56	51	37
Central Latin America	114	73	68	48
Andean Latin America	97	56	59	35
Caribbean	72	38	42	30
High-income North America	128	83	61	45

goiter rates and a disability of moderate mental retardation was assigned to the cretinism cases. More subtle and widespread degrees of mental impairment due to IDD were not considered.

Tables 1 and *2* and *Figure 1* are generated from data at: *http://www.healthmetricsandevaluation.org*. Because of the mistakes in the GBD 2010 approach, the YLD and DALY estimates for 2010 in the tables and figure are largely inaccurate and are presented here only for illustrative purposes.

It is unfortunate the GBD 2010 project made these fundamental mistakes, because an opportunity was missed to highlight the enormous global progress against IDD achieved over the past two decades.

References

1. M Wang, K Ortblad, C Murray, M Naghavi. Analytic Strategy for Iodine Deficiency in GBD 2010. Report to Expert Group. April 2012.
2. Zimmermann MB, Andersson M. Update on iodine status worldwide. Curr Opin Endocrinol Diabetes Obes. 2012 Oct;19(5):382-7.