

Supplementary Information

To follow lithium (Li) through the filtration process at the waterworks, and to verify the quality of Li data from [1], we have analysed data from seven waterworks (supplying Copenhagen), where Li measurements are done both by Inductively coupled plasma mass spectrometry (ICP-MS) (reported in [1]) and Atomic absorption spectroscopy (AAS) (reported here for first time), see Table S1.

In a separate survey carried out by Greater Copenhagen Water Supply Company (HOFOR, Copenhagen, Denmark) at these waterworks (all owned by HOFOR), the following was analysed: (1) untreated mixed groundwater from 46 well fields, each connected to one of the waterworks and sampled once or twice in the period from October 2009 to October 2010, and (2) treated drinking water samples analysed three times in the period October 2009–July 2010.

To estimate the Li concentration in the untreated water entering each of the waterworks, the relative groundwater abstraction of each well-field (in percent) entering a given waterwork was calculated and used as a weight for the calculation of weighted average Li concentration in the untreated mixed groundwater. The estimates were compared with the Li concentrations in the treated drinking water leaving the waterworks (both analysed by the ASS method and the ICP-MS method).

Details for the period of analysis:

- **Drinking water (ICP-MS method):** one time sampling in 2013 (see details in [1]);
- **Drinking water (ASS method)** was sampled three times: October 2009, January 2010 and in July 2010;
- **Untreated mixed groundwater (ASS method)** sampled once or twice: at the 7 well fields of Waterwork 1: November 2009 or February 2010; at the 12 well-fields of Waterwork 2: November 2009, January 2010, or October 2010; at the 9 well-fields of Waterwork 3: October 2009, November 2009, February 2010, March 2010, June 2010, or October 2010; at the 6 well-fields of Waterwork 4: October 2009, November 2009, February 2010, or October 2010; at the 2 well-fields of Waterwork 5: February 2010; at the 6 well-fields of Waterwork 6: January 2010 or February 2010; at the 4 well fields of Waterwork 7: November 2009 or May 2010.

Table S1. Relative groundwater abstraction (%) and lithium concentration ($\mu\text{g/L}$) in the untreated mixed groundwater at the well-fields of seven waterworks supplying Copenhagen, compared to the lithium concentrations in the treated drinking water at these waterworks.

Waterwork	1 (7 well fields)		2 (12 well fields)		3 (9 well fields)		4 (6 well fields)		5 (2 well fields)		6 (6 well fields)		7 (4 well fields)	
Well field No.	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)	X (%)	Y ($\mu\text{g/L}$)
1	6.7	26	3.7	13	23.5	11.0	9.0	15.0	25.0	8.0	9.0	7.3	37.7	6.3
2	15.1	33	3.9	11	12.4	11.5	1.9	9.9	75.0	10.0	14.5	11.0	32.6	8.9
3	26.6	12	2.7	19	4.1	16.5	5.3	9.8			10.3	9.1	9.7	10.4
4	28.5	13	3.3	10	2.9	16.5	66.1	8.0			13.1	8.3	20.0	11.0
5	5.4	29	9.4	32	16.2	9.1	13.5	13.0			34.7	8.6		
6	14.6	35	2.1	20	6.3	11.5	4.3	11.5			18.3	8.0		
7	3.1	32	19.1	16	7.5	11.0								
8			35.6	19	7.0	10.5								
9			11.9	14	20.2	9.1								
10			2.1	14										
11			2.3	28										
12			4.0	48										
Untreated mixed groundwater (weighted average)		21.3		19.1		10.8		9.6		9.5		8.7		8.5
Drinking water (ASS method)		25.7		19.7		11.7		10.6		9.1		9.3		8.9
Drinking water (ICP-MS method)		29.5		20.9		14.1		9.9		10.7		11.4		10.3

Notes: X: Relative groundwater abstraction of the individual well-fields (in percentage) from the total annual (average of 2009 and 2010) groundwater abstraction of the waterwork. Y: Lithium concentration (average if more than one analysis) in the untreated mixed groundwater from the individual well-fields (ASS method).

Reference

1. Voutchkova, D.D.; Ernstsens, V.; Hansen, B.; Sørensen, B.L.; Zhang, C.; Kristiansen, S.M. Assessment of spatial variation in drinking water iodine and its implications for dietary intake: A new conceptual model for Denmark. *Sci. Total Environ.* **2014**, *493*, 432–444.