

EMBARGOED UNTIL JANUARY 15, 2020 9.00 AM EST / 4.00 PM CEST

Exposure to Chemicals in Drinking Water Associated with 5% of Annual Bladder Cancer Burden in Europe

Macro study analyses for the first time the presence and health impact of trihalomethanes in tap water in 26 European Union countries

Barcelona, January 15, 2020-. Each year, more than **6,500 cases of bladder cancer—nearly 5% of all cases in Europe—** can be attributed to **exposure to trihalomethanes (THMs) in drinking water**. This is one of the conclusions of a large-scale study led by the Barcelona Institute for Global Health ([ISGlobal](#)), a centre supported by "la Caixa", that analysed for the first time the presence of these chemical compounds in the tap water of 26 European Union countries.

Trihalomethanes are formed as an unintended consequence of water disinfection. Earlier research has found an association between **long-term exposure to THMs—**whether through ingestion, inhalation or dermal absorption—**and increased risk of bladder cancer**.

The authors of the new study, published in *Environmental Health Perspectives*, analysed **recent data on trihalomethanes levels in European municipal tap water** and estimated the burden of disease for bladder cancer attributable to exposure to these compounds.

"The biggest challenge was collecting representative data on national trihalomethanes levels for all EU countries", explained **Cristina Villanueva**, the ISGlobal researcher who coordinated the study. "We hope that these data will become **more readily available** in the future."

The researchers sent questionnaires to bodies responsible for municipal water quality requesting information on the **concentration of total and individual trihalomethanes** (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) at the tap, in the distribution network and at water treatment plants. Complementary data was obtained from other sources (open data online, reports, scientific literature, etc.). **Trihalomethanes data for 2005 to 2018 were obtained for 26 European Union countries—**all except Bulgaria and Romania, where less information was available—**covering 75% of the population**.

The findings revealed considerable differences between countries. **The average level of trihalomethanes in drinking water in all countries was well below the maximum permissible limit in the EU—11.7 µg/L versus 100 µg/L—** but the **maximum reported concentrations did exceed the limit in nine countries** (Cyprus, Estonia, Hungary, Ireland, Italy, Poland, Portugal, Spain and the United Kingdom).

Lead author **Iro Evlampidou** described the study as being "of particular interest to countries with **high average levels of trihalomethanes concentrations recorded in tap water**."

Association with Bladder Cancer

The number of **attributable bladder cancer cases** was estimated through a statistical calculation linking average levels of trihalomethanes with the international information available of bladder cancer incidence rates for each country.

In total, the researchers estimated that 6,561 bladder cancer cases per year are attributable to trihalomethanes exposure in the European Union. **Considerable differences** were found between countries. **Spain** and the **United Kingdom** had the largest number of attributable cases of bladder cancer—1,482 and 1,356, respectively—due in part to the high incidence of bladder cancer and their large population.

The countries with the highest percentage of bladder cancer cases attributable to THM exposure were **Cyprus** (23%), **Malta** (17%), **Ireland** (17%), **Spain** (11%) and **Greece** (10%). At the opposite extreme, there were **Denmark** (0%), **Netherlands** (0.1%), **Germany** (0.2%), **Austria** (0.4%) and **Lithuania** (0.4%).

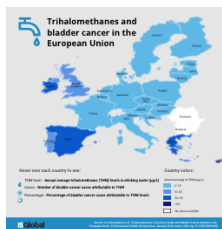
“Over the past 20 years, **major efforts have been made** to reduce trihalomethanes levels in several countries of the European Union, including Spain”, commented ISGlobal researcher **Manolis Kogevinas**. “However, the current levels in certain countries could still lead to **considerable bladder cancer burden**, which could be prevented by **optimising water treatment, disinfection and distribution practices** and other measures.”

The authors of the study recommended that efforts to reduce trihalomethanes levels should focus on countries with the highest average levels. If the 13 countries with the highest averages were to reduce their THM levels to the EU average, the researchers estimate that **2,868 annual attributable bladder cancer cases—44% of the total— could potentially be avoided.**

Reference

Iro Evlampidou, Laia Font-Ribera, David Rojas-Rueda, Esther Gracia-Lavedan, Nathalie Costet, Neil Pearce, Paolo Vineis, Jouni J.K. Jaakkola, Francis Delloye, Konstantinos C. Makris, Euripides G. Stephanou, Sophia Kargaki, Frantisek Kozisek, Torben Sigsgaard, Birgitte Hansen, Jörg Schullehner, Ramon Nahkur, Catherine Galey, Christian Zwiener, Marta Vargha, Elena Righi, Gabriella Aggazzotti, Gunda Kalnina, Regina Grazuleviciene, Kinga Polanska, Dasa Gubkova, Katarina Bitenc, Emma H. Goslan, Manolis Kogevinas, Cristina M. Villanueva. Trihalomethanes in Drinking Water and Bladder Cancer Burden in the European Union. *Environmental Health Perspectives*, January 2020. <https://doi.org/10.1289/EHP4495>.

Graphic material



Interactive map of the European Union with the annual average trihalomethanes levels, and the number and percentage of bladder cancer cases attributable to THM. Copy: ISGlobal from paper data.

<http://bit.ly/ISGlobalTapWaterEurope>

About ISGlobal

The Barcelona Institute for Global Health, ISGlobal, is the fruit of an innovative alliance between “la Caixa” and academic and government institutions to contribute to the efforts undertaken by the international community to address the challenges in global health. ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute’s Education and Policy and Global Development departments. ISGlobal has been named a Severo Ochoa Centre of Excellence and is a member of the CERCA programme of the Generalitat de Catalunya.

ISGlobal’s Press Office

Marta Solano
marta.solano@isglobal.org
 +34 93 214 73 33 / +34 661 451 600

Carol Pozo
carolina.pozo@isglobal.org
 +34 93 214 73 33 / +34 696 91 28 41

A partnership of:

