

Priority chemical pollutants of drinking water in the city of Kazan: Approach based on risk assessment

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Abstract

© Published under licence by IOP Publishing Ltd. Assessment of non-carcinogenic risks from chemical substances ingested with drinking water included peroral, skin and inhalation routes of contact with water. The study was carried out for children aged 3-6 years living in 4 districts (zones) of the city of Kazan. Regional exposure factors (REF) at the median (Me) and the 95-th Percentile (95P) levels were identified according to the results of the questionnaire survey. The value of total hazard indices (THI) calculated with application of REF at the median (Me) and the 95-th Percentile (95P) levels made THIME = 14.2 and 17.1, and THI 95perc = 13.03 and 16.3 in zones with a combined type of water supply. The ingestion of chemical substances with drinking water in different zones of the city of Kazan implies, alert and high levels of non-carcinogenic health risk for the child population.

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References

- [1] 2016 State report (Moscow: Federal Service on Surveillance in the Sphere of Consumer Rights Protection and Human Welfare) On the Status of the Sanitary and Epidemiological Welfare of the Population in the Russian Federation in the Year of 2015 200
- [2] Zhang L et al 2015 Sci. Total Environ 5 163-70
- [3] AbRazak N H, Praveena S M, Aris A Z and Hashim Z 2015 J. Epidemiol. Glob. Health 5
- [4] Andra S S and Makris K C 2014 Water Health 12 81-93
- [5] Chowdhury S and Hall K 2010 Environmental International 36 453-60
- [6] Gopal K, Tripathy S S, Bersillon J L and Dubey S P 2007 J. Hazard Mater 140 1-6
- [7] Whitaker H, Nieuwenhuysen M J, Best N, Fawell J, Gowers A and Elliot P 2003 Journal of Exposure Analysis and Environmental Epidemiology 13 17-23
- [8] Villanueva C M, Kogevinas M, Cordier S, Templeton M R, Vermeulen R, Nuckols J R, Nieuwenhuijsen M J and Levallois P 2014 Environmental Health Perspectives 122
- [9] 2011 Guidelines World Health Organization (WHO) 4 (Gutenberg: WHO) Guidelines for Drinking-Water Quality 564
- [10] Firestone M 2010 J. of Exposure Science and Environmental Epidemiology 20 227-8
- [11] Margot T B and Foos B P 2009 Hum. Ecol. Risk Assess 15 923-47
- [12] 2011 Summary of principles for evaluating health risks in children associated with exposure to chemicals (Switzerland: WHO) 50 2011
- [13] Brown M and Foos B 2009 Hum. Ecol. Risk Assess 15 923-47
- [14] Rakhmanin J A et al 2004 Guidelines for health risk assessment for the population on exposure to chemical substances polluting the environment (P 2.1.10.1920-04) (Moscow: Federal Center of the State Committee for Sanitary and Epidemiological Control) 143

- [15] U S EPA 2005 Guidance on Selecting Age Groups for Monitoring and Assessing Childhood Exposures to Environmental Contaminants (Washington: U.S. EPA) 50
- [16] U S EPA 2011 Exposure Factors Handbook (Final Report) (Washington: U.S. Environmental Protection Agency, DC) EPA/600/R-09/052F
- [17] Stepanova N V, Valeeva E R and Fomina S F 2015 Hygiene and sanitation 5 56-61
- [18] Stepanova N V, Valeeva E R, Ziyatdinova A I and Fomina S F 2016 Research J. of Pharmaceutical, Biological and Chemical Sciences 7 1677-81
- [19] Masaev V T 2002 (instead SanPin 2.1.4.559-96)Sanitary rules and norms (Moskow: Russian Ministry of Health) SanPin 2.1.4.1074-01. Drinking water Hygienic requirements for water quality of centralized drinking water supply systems 67
- [20] 2008 Guidelines for Drinking-water Quality (Switzerland: WHO) WHO/SDE/WSH/05.08/123 Petroleum Products in Drinking-water. Background document for development of WHO 20
- [21] Karim Z, Mumtaz M and Kamal T 2011 J of Chemical Society of Pakistan 33 215-9
- [22] Basu M, Gupta S K, Singh G and Mukhopadhyay U 2011 Environ Monit Assess 178 34