RISK ASSESSMENT OF THE MIXTURE OF CHEMICALS WITH MISSING AND INTERVAL MEASUREMENTS SUCH AS DIOXINS OR PCBS

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In case of assessing human exposure to dioxins or polychlorinated biphenyls (PCBs), we often use weighted sum of a group of structurally related chemicals, such as toxic equivalency value (TEQ), rather than each chemical. The exposure levels for each chemical are very low, so the data include some incomplete measurements. Some measurements may be under the limit of detection (LOD), these are interval data, and other measurements may be missing. When the data include incomplete measurements for some chemicals we cannot calculate the weighted sum of chemical amounts. We need to deal with such data. In case of handling such data, a measurement less than the LOD has been sometimes assigned zero or a value of the LOD divided by 2 or a value equal to the LOD divided by the square root of 2 for calculation of geometric means. Also sometimes missing measurements have not been handled on a statistical basis. This report proposes a method to assess the risk of the mixture of chemicals those measurements include some interval data and/or some missing data by extending the Mann-Whitney type comparison.