



Contents lists available at ScienceDirect

International Journal of Hygiene and Environmental Health

journal homepage: www.elsevier.com/locate/ijheh

Consumers' perceptions of biocidal products in households

Stefanie Wieck*, Oliver Olsson, Klaus Kümmerer*

Institute of Sustainable and Environmental Chemistry, Leuphana University of Lüneburg, Universitätsallee 1, 21335 Lüneburg, Germany

ARTICLE INFO

Keywords:

Biocides
Questionnaire
Risk communication
Sustainable chemistry
Household
Consumer

ABSTRACT

Biocidal products are commonly used in households and can pose a risk to human health and the environment. The aim of this study was to evaluate consumers' use and understanding of biocidal products in order to identify starting points for minimising their exposure to these products and reducing possible emissions to the environment. In a case study, standardised questionnaires were used to interview consumers in 133 households in three neighbourhoods in Northern Germany, representing the urban–rural typologies in Europe: predominantly urban, intermediate and predominantly rural regions. The questions focussed on the comprehension of the term 'biocide', pest control habits, sources of information, risk perception of different product groups and possible emission reduction measures.

Only 21% of the respondents understood the term 'biocide' correctly, whereas 29% thought of 'something that had to do with organic pest control', and 28% were not able to think of a possible meaning. The risk perception of biocidal products compared to plant protection products varied depending on the living conditions. In the urban neighbourhood, biocidal products were perceived as more dangerous than in the rural area. The main pests to be fought were ants, mould and fruit fly. The results of the study indicate that there is a considerable difference between the types of biocidal products that interviewees claimed to own and those that they actually did have in their households. Most notably, respondents did not realise that they owned surface disinfectants. This result indicates that consumers often seem not to be aware of using specific biocidal products. Also, this shows the limitations of collecting data on products owned with only one method, as the results from products inventories of the households deviate from the data collected in interviews.

Our results show that the term 'biocide' is not fully understood by many people. To communicate possible risks of biocidal products, other terms would have to be used. Online information regarding general facts on necessary general hygiene measures and biocidal products against bacteria and insects are likely to be of highest relevance for consumers. However, risk communication for biocidal products in general is difficult because consumers are often not aware of using biocidal products. For this reason, information and awareness raising campaigns should be accompanied by further measures such as sales restrictions for specific user-groups or prohibitions of certain uses for a sustainable use of biocidal products.

1. Introduction

1.1. Information of consumers regarding household chemicals

Chemical products are often used in households and can pose risks towards the health of consumers (Buffet-Bataillon et al., 2016; Geier et al., 2012; Hahn et al., 2010; Horton et al., 2011; Llop et al., 2013; Presgrave et al., 2008; Ruckart et al., 2004; Webber et al., 2017) and the environment (Brausch and Rand, 2011; Buergi et al., 2007; Corcellas et al., 2015; Kosma et al., 2014; Rüdél et al., 2013; Ternes et al., 2004; Weigel et al., 2002). Biocidal products constitute a specific group within household chemicals, next to, for example, washing and

cleaning agents and personal care products. Biocidal products are regulated in *Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products* (BPR). They are defined as products 'with the intention of destroying, deterring, rendering harmless, preventing the action of, or otherwise exerting a controlling effect on any harmful organism by any means other than mere physical or mechanical action' (European Union, 2013b). Biocidal active substances can also be incorporated in personal care products and washing and cleaning agents as in-can preservatives. The benefits of the use of biocidal products in households have been questioned, especially for disinfectants (Food and Drug Administration, 2016; Kim et al., 2015; Larson et al., 2004; Pieper et al., 2014). It is therefore very important

Abbreviations: BPR, Biocidal Products Regulation (EU) 528/2012; df, degrees of freedom; PT, product type

* Corresponding author.

E-mail addresses: wieck@leuphana.de (S. Wieck), klaus.kuemmerer@uni.leuphana.de (K. Kümmerer).

<https://doi.org/10.1016/j.ijheh.2017.11.005>

Received 23 July 2017; Received in revised form 9 November 2017; Accepted 20 November 2017

1438-4639/© 2017 Elsevier GmbH. All rights reserved.

that consumers use these products only if necessary and, if needed, in an appropriate and a safe manner. For this reason, consumers need to be informed about risk mitigation measures for biocidal products and understand why they should comply (Bruinen de Bruin et al., 2007; Ternes et al., 2004).

In today's world, politics and economy often expect consumers to be 'reasonably well informed and reasonably observant and circumspect' (European Court of Justice, 1998). They are expected to make informed choices, e.g. buying and applying household chemicals, based on what is known about risks for humans or the environment (European Union, 2013a). However, this paradigm has been questioned regularly, as studies have shown that consumers often know very little about the different types of chemical products they use in their households (Epp et al., 2010; European Commission, 2016b, 2011; Glegg and Richards, 2007). Until now, the attitudes towards biocidal products in particular have never been studied, other than for human pharmaceuticals or washing and cleaning agents (Adomßent, 2015; Bearth et al., 2017; Bound and Voulvoulis, 2005; Götz and Keil, 2007; Stemplewski et al., 2014). Only some biocidal product types were studied together with other product groups (Armes et al., 2011; Bennett et al., 2012; Moran et al., 2012; Wu et al., 2011). The hitherto available results indicate that biocidal products are perceived as less dangerous than plant protection products (ANSES, 2010).

The perceived risks by consumers usually differ from the risks detected during regulatory risk assessments (Kraus et al., 1992). The severity of ecotoxicological risk is calculated using hazard and the probability of exposure. However, Kraus et al. (1992) show that consumers have difficulties understanding that the exposure is influencing the risk. This makes the communication of risks by chemicals difficult (OECD, 2002; Scheer et al., 2010). At the same time, consumers are confronted with professional marketing experts (Howells, 2005) and advertising campaigns that do not necessarily allow them to base their purchase decisions on an informed risk assessment, as it has previously been shown for household disinfectants (Wieck, 2015). This is particularly problematic because risks and benefits of household chemicals often cannot be perceived directly (Beck, 2017). The OECD guidance document on risk communication for chemical risk management offers suggestions on how to draft communication strategies on chemical topics. Two-way communication would be ideal (OECD, 2002). However, it is difficult to reach a broad audience with it, so one-way communication is often used. Especially for those information offers, for example print and online, it is crucial to know the needs of the recipients and starting points, depending on the topic (OECD, 2002). It is therefore of great importance to close the knowledge gaps on the perception of biocidal products by consumers for a targeted information campaign. At the same time, it has to be kept in mind that even if information is available, it only has a limited effect on consumer behaviour (Howells, 2005). For this reason, this study will discuss possibilities for consumer protection that go beyond information and awareness raising campaigns.

1.2. Data collection on perception of biocidal products by consumers

Methods to evaluate the knowledge of consumers regarding products are usually based on questionnaires. These can be done by online, self-administered questionnaires, via telephone or face-to-face. While response rates and engagement of the interviewees is higher in face-to-face settings than online, these are also more time-consuming and costly (Hertz-Picciotto et al., 2010). Some large studies have evaluated the knowledge and assessment of household chemicals in general by consumers. Studies on chemicals in general by the German Federal Institute for Risk Assessment and the European Chemicals Agency were conducted with more than 1000 participants by telephone (Epp et al., 2010) and up to more than 27000 participants face-to-face, respectively (European Commission, 2016b, 2011; Midden et al., 2011). Other studies focussed on specific biocidal product types amongst other product

groups (ANSES, 2010; Bennett et al., 2012; Moran et al., 2012). While most of the studies used quantitative approaches with structured questionnaires, others used qualitative interviews (Midden et al., 2011) or both (Glegg and Richards, 2007). However, up to now no one has explored the perception of biocidal products in general by consumers, focussing on their particularities such as terms and the diversity of uses. In addition, most studies investigating product inventories use answers of consumers on products owned and used without validating the responses. This makes an assessment of the validity of these studies difficult. Inventories could be verified by comparing data on products obtained by questionnaires to product inventories established by third parties of the same households. For the households examined in this study, we already had product inventories available (Wieck et al., 2016) making a comparison of the two survey methods possible.

1.3. Objectives

As the above-mentioned studies did not evaluate consumers' perception of biocidal products in particular, the objective of this study is to analyse consumers' use and understanding of this product group and to evaluate how they could be further encouraged to use them in a sustainable way. Additionally, this study compares data collected using questionnaires about products owned to data from product inventories based on barcode scans in the same households, which validates the data collected by both methods. In the following, we present the results of a standardised quantitative questionnaire in three neighbourhoods. Based on these results, we identify consumers' status quo perception of biocidal products and derive possible starting points to adjust consumer protection strategies supporting a more sustainable use.

2. Material and methods

2.1. Study design

Interviews were conducted in person with one willing household member of 133 households in three neighbourhoods in Northern Germany (BBSR, 2009), representing the three different urban–rural typologies in Europe (Eurostat, 2017). Neighbourhood A represents predominantly rural regions. It is dominated by single-family homes within a small town of approximately 3000 inhabitants. Neighbourhood B represents the intermediate regions and is dominated by multi-family homes within a town of 33000 inhabitants. Neighbourhood C is characteristic of the predominantly urban regions and lies within Hamburg (1.8 Mio. inhabitants). This neighbourhood consists of multi-family homes with a high proportion of shared flats. Table 1 (Wieck et al., 2016, modified) depicts the demographic characteristics of all interviewees and households.

After agreeing to participate in the study, a trained interviewer asked questions from a standardised questionnaire and noted responses on the questionnaire form. These sessions were structured and the trained interviewer only asked questions from the questionnaire, using it similar to a script. After the questionnaire was completed, the trained interviewer took barcode scans of all biocidal products, washing and cleaning agents and wastewater-relevant personal care products in the households. The results of the barcode scans are published in Wieck et al. (2016), the results of the questionnaires are presented in this publication.

To recruit participants in Neighbourhood A, all households were sent a letter from the cooperating local disposal company in agreement with the town mayor. This letter contained information regarding the project and the planned study. The interviews were conducted between March and May 2015. In this neighbourhood, the goal was to obtain a complete survey of the neighbourhood's entire 145 households. Therefore, all households in the neighbourhood were contacted several times to achieve this goal and no sampling strategy was necessary. In the end, 94 households within this neighbourhood participated in the

Download English Version:

<https://daneshyari.com/en/article/8549756>

Download Persian Version:

<https://daneshyari.com/article/8549756>

[Daneshyari.com](https://daneshyari.com)