Author's response to reviews

Title: Accidental exposure to gas emissions from transit goods treated for pest control.

Authors:

Stefan Kloth (stefan.kloth@googlemail.com)
Xaver Baur (xaver.baur@charite.de)
Thomas Göen (thomas.goeen@ipasum.med.uni-erlangen.de)
Lygia T Budnik (L.budnik@uke.de)

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Title: Accidental exposure to gas emissions from transit goods treated for pest control.

Response to the reviewer report

We would like to thank both reviewer for valuable suggestions. We would specially like to thank the reviewer Number 2 for appreciated suggestions, which allowed us to improve the manuscript.

You will find below the list of our corrections.

Reviewer 1. Geoffrey M Calvert

Major concerns:
1. It is not well-written and is very difficult to follow.

The paper was now corrected by a professional proof-reader. We hope that it meets your requirements now

2. It’s not clear what is novel about this report.

Little literature data is available, if any.

Though we are aware about many intoxication cases in several European countries, there is hardly any awareness between the companies H&S or industrial physicians. Though accidents happen every week (evenduring last two weeks, there were two incidences in Germany, with seriously intoxicated, hospitalized patients), also we are aware about similar cases from other countries like i.e. the Netherlands, With this publication, we wanted to show a case report, a typical example to inform physicians and industrial hygienists, what was done wrong, Guidelines are needed showing proper preventive measures.

3. It isn’t clear why this certain medium sized company was chosen for study. Is this the only company known to have had this problem?

For many companies (most), we are not allowed to present such data; even in this case, we had to anonymize the information. We have chosen this company, first because it is more or less typical for small companies, second because in this case we had complete information, clinical data, samples etc. unlike some other cases, and third because we would like to raise awareness: in this company several incidences repeatedly happen due to management failure and lack of respective guidelines (mistakes are the best teachers)

4. Very little information is provided for what these workers were exposed to. Did the investigators determine the source of the shipments thought to be responsible for the exposure? What country were they shipped from? What specific parts were shipped? What fumigant was used to treat those shipments?

The shipped production parts were fumigated with either methyl bromide or ethylene oxide. Methyl bromide is the only fumigant required for
container fumigation according to the ISPM15; base on our experience the ethylene oxide is often used for fumigation/ disinfection of the medical equipment.

5. No information provided on how these events came to the attention of the authorities/authors.  

*The authors were providing the independent expert opinion on the case for the court.*

6. If events occurred in 2010-2012, why was the investigation delayed until 2013?  

*The investigation was not delayed, our reporting was delayed. The investigation was performed as soon as we got request for it. We performed analyses in 2011, 2012 and 2013. After the third incidence (we expected that the mistakes are the best teachers) and the examination as independent experts in case of social security case examination, because of the persisting symptoms, we have decided to publish the case. In this case, we had more information provided,*

7. No epidemiology provided for why laboratory confirmation of intoxication was present for three of six patients. What was different about the other three “negative” patients? Did their tasks differ or duration of exposure differs compared to the “positive” workers?  

*The information, we were provided was that one patient is a supervisor for the other 5, all 5 were supposed to work in the same storage room. However since after the first incidence the workers decided to unpack the items in one separate room and then transport them to s separate storage room, the two, who were ill at the beginning were working in other parts of the storage room. This information, was however not included in the official report.*  

*We have now included this information in the revised version of the manuscript.*

8. Little info was available on how to prevent these incidents. According to the authors, fumigation is required when using wood packaging, or shipping wood parts or flooring material. Since the company under study imported electronic construction parts, it seems wood parts or flooring material is not the problem. Could the problem be avoided by not using wood packaging?  

*All pellets have wooden flooring material, it is for sure a problem, maybe it could be avoided, we do not know.*  

*But even if these parts are removed the gas can be trapped between the plastic foils and in the machine parts. Several literature references provide similar information on pesticides trapped between the plastic and flooring material.*

9. If the company knew the parts were fumigated, what procedures were
undertaken to prevent exposure? Are the parts aerated? What type of ventilation is provided in the area where these parts are unpacked and stored? Is the air monitored for the presence of fumigants to ensure that the area is safe to work in?

The companies engineer has informed the workers that the parts might be fumigated and the measurements were performed with colorimetric tubes. There is natural ventilation in the storage room.

10. No information on when (month and year) the exposures occurred.

Kindly see the table 1 for details of intoxications in 2010, 2011, 2012 and the follow up in 2013. We are not allowed to provide more detailed information.

11. On several pages, a “governmental hygienist” is mentioned, but not from which country or which governmental agency.

The accident occurred in Germany, the Company is German, recently became a part of a global American logistic company. There is no companies own occupational physician unit. The Governmental Industrial hygienist in charge, according to the German federal system, is the one working for the state in which the workers are employed (in this case Bavaria).

Reviewer: Michael OMalley

Reviewer’s report:
1. Is the question posed by the authors new and well defined?

The paper is largely descriptive, evaluating markers for fumigant exposures to workers handling fumigant treated, but unlabeled, electronics. From my perspective, the documentation of exposure in this context is important and addresses an important public health issue.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?

The methods are fairly well described, with some limitations related to awkward syntax and use of English.

The paper was corrected by a native speaker. We hope that it meets your requirements now

3. The clinical methods – including criteria for diagnosis – are not well defined. It seems to be based upon symptoms.

We have now included detailed information on clinical diagnosis. Kindly see the revised version of the manuscript

Why was there such a long interval between exposure and initial biomonitoring?

This was due to the lack of knowledge (guidelines, we suggest here) and
management mistakes.

Explain further the prior literature on use of Hb adducts and how it contributes to the diagnosis.

We have now provided additional information on the use of Hb adducts, possible interferences. See the revised version of the manuscript. Thank you for pointing this to us.

What are the possible interferences with the Hb-adduct methodology besides smoking?

*The information is now included in the revised version of the manuscript.*

How does the extrapolation method apply if there are multiple exposures involved?

*See our additional comments in the revised version of the manuscript.*

*The method is most suitable assuming a single accidental high exposure.*

It would be helpful to explicitly discuss the expected half-life of the different types of monitoring (this is done principally for the Hb adducts).

e.g. – prior literature shows half-life of serum bromide – 10-12 days (http://www.inchem.org/documents/pims/chemical/methbrom.htm). The negative results of blood bromide was expected because initial evaluation took place many half-lives after the exposure.

*Additional information on half-lives is now provided and discussed in the revised version of the manuscript.*

If t1/2 for Hb adducts correlates with the lifespan of the cells, the expected t1/2 is related to the cycle of RBC – typically 100-120 days – as discussed in the article on page 5 of the pdf file.

*The literature data (provided here, Bader et al., shows that the method is applicable for past exposures up to 175.*

Mercapuric acid derivative levels are expected to reflect very recent exposure only E.g. Occup Environ Med. 1995 Sep;52(9):611-20.

Biological monitoring of exposure to benzene: a comparison between S-phenylmercapturic acid, trans,trans-muconic acid, and phenol. Boogaard PJ1, van Sittert NJ.

The half-life reported in this study was a matter of hours.

*Yes, we agree with that, additional information is provided*

Terminology questions:
Acrotaxia is a term that I don’t use personally - I couldn’t find it in the online Merriam-Webster dictionary (m-w.com), although I did find it a free online medical dictionary.

Acrotaxia

Acrotaxia A rarely used term for ataxia of the extremities - http://medical-dictionary.thefreedictionary.com/acrotaxia

not found in m-w.com

The authors may be describing what I would call an “intention tremor” - i.e. a tremor with voluntary movement of the extremity.

We have now included necessary explanation to the latin medical word “acrotaxia” (which in fact is intension tremor)

3. Are the data sound and well controlled?

The data are observational and limited by the circumstances of exposure. The timing of initial biomonitoring is not ideal, but the use of external controls is helpful in evaluating the information presented

Industrial hygiene monitoring data need more explanation:

The workplace facility and the details on the incidence and the sampling are described in

Table 1. The air measurement verified methyl bromide concentration from 2.5 to 200 ppm (mean: 125 ppm with 2.5-200 ppm min-max) in the storage room between the packing materials 5 days after the incidence. After the third accident 15 ppm ethylene oxide could be detected in the storage room.

This needs a little bit of discussion and a little bit more context?

Were the levels this high at the time of the initial exposure?

We have now included additional discussion and explanation on that in the revised version of the manuscript.

Do these represent area samples (as opposed to individual worker breathing zone samples)? If so, how they relate to worker exposure?

Additional information is now provided in the revised version of the manuscript.

Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes, as far as can be ascertained.

4. Are the discussion and conclusions well balanced and adequately supported by the data?
Yes

5. Do the title and abstract accurately convey what has been found?

6. Is the writing acceptable?

Some instances of awkward syntax and use of vocabulary in describing the circumstances of exposure are present. Acroataxia (mentioned above) – may be best to clarify the meaning.

The description of the work process was difficult for me to follow:

The workers were described as “unpacking wooden pellets with paper boxes covered with plastic (containing construction parts) and managing the construction parts for the production line”

Some clarification is necessary:

What are “construction parts” – electric wiring or microelectronics components?

Some more information is now provided in the revised version of the manuscript. The description of the “production parts” does not provide any additional information to the problem. We know similar problems in the machine factory, shoe factory or even food factory.

To your information: those were various electronic parts for medical equipment. If we provide more information, we may become problems with the company’s law office.

Why is fumigation necessary for these products?

The fumigation according to ISPM 15 is not related to the products. Fumigation is aiming to stop spreading alien species i.e. insects, worms, larvae etc between geographical zones in the world (i.e. capture between the boxes, wooden pellets etc). It aims to protect the environment not the products (for those phytosanitary requirements other regulations may apply).
7.
Yes, as far as can be ascertained.

8. Are the discussion and conclusions well balanced and adequately supported by the data?
Yes

9. Do the title and abstract accurately convey what has been found?

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The workers were described as “unpacking wooden pellets with paper boxes covered with plastic (containing construction parts) and managing the construction parts for the production line”

Some clarification is necessary:

What are “construction parts” – electric wiring or microelectronics components?

Why is fumigation necessary for these products?

The fumigation according to ISPM 15 is not related to the products. Fumigation is aiming to stop spreading alien species i.e. insects, worms, larvae etc. through the world (i.e. capture between the boxes, wooden pellets etc)