

14 June 2017

WorkSafe New Zealand,  
PO Box 165  
Wellington 6140  
New Zealand

[jim.napier@worksafe.govt.nz](mailto:jim.napier@worksafe.govt.nz)

**Submission on Workplace Exposure Standard (WES) and Biological Exposure Index (BEI) Review of lead and inorganic lead dust and fume.**

Thank you for the opportunity for Auckland Regional Public Health Service (ARPHS) to provide a submission on Workplace Exposure Standard (WES) and Biological Exposure Index (BEI) Review of lead and inorganic lead dust and fume.

The following submission represents the views of ARPHS and does not necessarily reflect the views of the three District Health Boards it serves. Please refer to Appendix 1 for more information on ARPHS.

The primary contact point for this submission is:

Tracey Ellis  
Policy Analyst  
Auckland Regional Public Health Service  
09 623 4600 (ext.26482)  
[traceye@adhb.govt.nz](mailto:traceye@adhb.govt.nz)

Yours faithfully,



Jane McEntee  
General Manager  
Auckland Regional Public Health Service



Denise Barnfather  
Medical Officer of Health  
Auckland Regional Public Health Service

**Auckland Regional Public Health Service**

Cornwall Complex, Floor 2, Building 15 | Greenlane Clinical Centre, Auckland | Private Bag 92 605, Symonds Street | Auckland 1150,  
New Zealand

Telephone: +64 9 623 4600 | Fax: +64 9 623 4633 | [www.arphs.govt.nz](http://www.arphs.govt.nz)

## Summary

ARPHS's area of interest and expertise relates to the blood lead level (BEI) considered safe for human health, and not the safe levels for inorganic lead dust and fumes. Nevertheless, the Workplace Exposure Standard (WES) is integral to protect workers from the adverse effects of airborne concentration of inorganic lead dust and fumes.

ARPHS is pleased to see that WorkSafe NZ is lowering the current BEI and suspension levels. However, based on the available evidence, we do not believe that WorkSafe NZ has gone far enough to protect human health. ARPHS notes that the proposed standards are based on a SafeWork Australia review. We believe any proposed changes should align with existing New Zealand public health standards.

ARPHS therefore considers:

- The BEI for women and men should be reduced to 0.48  $\mu\text{mol/L}$ , which is consistent with the notification standard in Schedule 2 of the Health Act 1956.
- The evidence suggests that the BEI for women of reproductive age, pregnant women and breast feeding women should be reduced further. However, the medical officer of health is unable to notify Worksafe NZ of cases below this level as the Health Act 1956 has a notification level of 0.48 $\mu\text{mol/L}$  and above.
- The suspension (removal) level for all workers should be at the set BEI if further exposure to lead in the workplace cannot be prevented.
- A new return to work level should be established. People vary in their ability to excrete lead from the body and this is further influenced by the length of time workers have been exposed to raised lead levels. The return to work level should be no greater than the BEI.

### **BEI for women and men should be reduced to 0.48 $\mu\text{mol/L}$ .**

The proposed BEI level for females of non-reproductive capacity and males is 0.97  $\mu\text{mol/L}$ . At this level the worker is likely to have ongoing and sustained exposure to levels of lead in the body that are considered to have adverse impacts on health.

There is growing evidence that there are several adverse health outcomes associated with blood lead levels below 0.48  $\mu\text{mol/L}$ , including peripheral arterial disease, impaired renal function and elevated blood pressure. A direct association between higher blood lead and increased mortality at substantially lower blood lead levels than reported previously were identified in a large US population-bases study.<sup>1</sup>

The US Department of Health and Human Services, in their Toxicological Profile for Lead 2007, also found that cognitive deficits, hypertension, and depressed glomerular filtration rate have been observed in older adults (>60 years and/or postmenopause) in association with blood lead levels below 0.48  $\mu\text{mol/L}$ <sup>2</sup>. This may reflect a higher

<sup>1</sup> Menke A, Muntner P, Batuman V, Silbergeld E, Guallar E Blood Lead Below 0.48  $\mu\text{mol/L}$  (10 $\mu\text{g/dL}$ ) and Mortality Among US Adults: Circulation, vol. 114, issue 13 (2006) pp. 1388-1394,

<sup>2</sup> US Department of Health and Human Services. Toxicological Profile for Lead, August 2007. <https://www.atsdr.cdc.gov/toxprofiles/tp13.pdf>

vulnerability with age and/or the effects of cumulative life-time exposures that are less evident in younger populations that have lower time-integrated exposures.

Under the proposed changes, women of childbearing age would presumably be excluded from the workplace more frequently and potentially for longer periods than men. Therefore, in addition to the known adverse cumulative effects on both men and women at 0.48umol/L, differential BEI levels are likely to have negative discriminatory effects on women of childbearing age.

#### **BEI for women of reproductive age, pregnant women and breast feeding women**

With regard to pregnant women, the evidence suggests that a BEI of 0.48umol/L is not conservative enough, although ARPHS acknowledges that this is the threshold currently set in legislation by the NZ Health Act 1956.

Findings of lead-related adverse reproductive outcomes have led to recommendations for women who are pregnant or of childbearing age to avoid occupational lead exposure, even at blood lead concentrations <0.48 umol/L.<sup>3</sup>

However, we are mindful that different BEI levels for women of a child bearing age may make it more difficult for women to obtain and maintain employment in lead industries.

#### **Set the suspension (removal) level for all workers at the set BEI**

ARPHS considers ongoing occupational lead exposure needs to stop once the agreed BEI is reached. If this requires suspension at the agreed BEI level to prevent further exposure, then this should occur. It is unacceptable to wait for a worker's blood lead level to increase further.

#### **ARPHS's regulatory role and lead exposure in New Zealand**

The proposal states that 227 occupationally lead exposed workers were notified to WorkSafe NZ between 2008 and 2016. However, this figure is unlikely to be a true representation of occupational lead exposure in the Auckland region.

For example, historically the medical officer of health has not notified WorkSafe NZ of all occupational lead notifications received. Under the Health Act 1956, the Medical Officer of Health has been receiving all blood lead level results of greater than or equal to 0.48umol/L since 2007. For each notification, a questionnaire is carried out by our health protection officers to determine source(s) of exposure. However, prior to enactment of the Health and Safety at Work Act 2015, there was no requirement to notify the Department of Labour, followed by the Ministry of Business, Innovation and Employment, and finally, WorkSafe NZ, of lead notifications received by the medical officer of health.

Secondly, there are various factors that influence the number of notifications received by the medical officer of health. For example, where the illness is not associated with severe

---

<sup>3</sup> Kosnett MJ, Wedeen RP, Rothenberg SJ, Hipkins KL, Materna BL, Schwartz BS, Hu H, Woolf A (2007) Recommendations for medical management of adult lead exposure. *Environ Health Perspect* 115, 463–71.

symptoms or symptoms are non-specific (both of which are invariably the case for lead poisoning until blood level approaches near-fatal levels), cases are less likely to consult a medical practitioner and, even if diagnosed, are less likely to be notified without laboratory confirmation.

Issues associated with the cost of healthcare may also determine whether people visit healthcare providers for diagnosis. The extent to which the data reflects the true incidence of occupational lead poisoning will also be affected by awareness of the disease, access to health services, use of diagnostic facilities, the case definition used for lead poisoning, and the interest, resources and priorities of local healthcare (and occupational health) services<sup>4</sup>.

### **Proposed changes to BEI should align with existing New Zealand public health standards**

Section 199 of the Health and Safety at Work Act 2015 requires that, if a medical officer of health receives a notification under section 74 of the Health Act 1956 of a notifiable disease that he or she reasonably believes arises from work, they must advise Worksafe NZ and provide the name of the person and the injury i.e. elevated blood lead level. Therefore, although the medical officer of health will notify Worksafe NZ of cases from 0.48umol/L under the proposed changes, Worksafe NZ will not respond to levels for men and non-reproductive women between 0.48 and 0.97umol/L.

This 'gap in action' is unacceptable on an evidential basis. It may also transgress legislative rules for sharing personal information between agencies, which requires that there is an acceptable basis for the sharing of personal information.

It is also unclear how Worksafe NZ will be able to appropriately distinguish between women who are, and are not, capable of reproduction. This would be necessary in order to determine which BEI to apply to different female cases.

Finally, it is important to note that sometimes the workplace is at the same physical location as a public space or private residence. On these occasions application of the proposed WES and BEI could lead to unacceptably high blood lead levels in non-workers/ members of the public. ARPHS has previously investigated cases where members of families have developed high lead levels beyond 0.48umol/L where works have been undertaken to remove and repaint residences containing leaded paint.

### **Other matters**

This submission makes the assumption that no children are employed on a casual basis in any industry where lead is used or where lead-based products are manufactured.

Please note that the WorkSafe NZ consultation response form has used the incorrect units for lead in blood i.e. mol/L instead of umol/L.

---

<sup>4</sup> The Institute of Environmental Science and Research Ltd. Notifiable Diseases in New Zealand: Annual Report 2014 Porirua, New Zealand. Available at: [https://surv.esr.cri.nz/PDF\\_surveillance/AnnualRpt/AnnualSurv/2014/2014AnnualReportFinal.pdf](https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2014/2014AnnualReportFinal.pdf)

## **Appendix 1 - Auckland Regional Public Health Service**

Auckland Regional Public Health Service (ARPHS) provides public health services for the three district health boards (DHBs) in the Auckland region (Counties Manukau Health and Auckland and Waitemata District Health Boards).

ARPHS has a statutory obligation under the New Zealand Public Health and Disability Act 2000 to improve, promote and protect the health of people and communities in the Auckland region. The Medical Officer of Health has an enforcement and regulatory role under the Health Act 1956 and other legislative designations to protect the health of the community.

ARPHS' primary role is to improve population health. It actively seeks to influence any initiatives or proposals that may affect population health in the Auckland region to maximise their positive impact and minimise possible negative effects on population health.

The Auckland region faces a number of public health challenges through changing demographics, increasingly diverse communities, increasing incidence of lifestyle-related health conditions such as obesity and type 2 diabetes, infrastructure requirements, the balancing of transport needs, and the reconciliation of urban design and urban intensification issues.

