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## Letter to the Editor

# Reply to the Letter by Dr Peter Griffin and Prof. Andrew Curran, “Response to Article by Prof. Hans Kromhout, Hygiene Without Numbers”

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Griffin and Curran (2016) claim that I misunderstood the HSE’s message from the presentation entitled ‘Hygiene without numbers’ at a meeting in Manchester in October, 2015. They claim that HSE provides task-specific information to support small- and medium-sized enterprises (SMEs) in achieving control, based upon workplace studies including substantial measurement activities. They substantiate this evidence-based approach by pointing to a program launched by the HSE over a decade ago in 2004 (ending in 2007) among spray painters using isocyanate-based paints in the motor vehicle repair industry (Piney et al. 2015). The evidence that this approach worked to reduce exposures came from an internal evaluation of the program showing that ‘18 per cent of body shops in the UK attended the SHADs (Safety and Health Awareness Days) and 90 per cent of the delegates expressed an “intention to act” to improve exposure control measures. A local assessment showed that at least 50 per cent of body shops improved exposure control measures.’ (Piney et al. 2015). The evidence of the approach’s success was based amongst others on biological monitoring data showing that post-SHAD exposures were lower. Details of this biomonitoring study can be found in the Piney et al. (2015) paper, but was previously published in the Annals of Occupational Hygiene by Jones et al. (2013). A close look at the design of the biomonitoring study shows that the researchers made a classic mistake in a longitudinal study and are actually

describing a phenomenon called ‘regression to the mean’ that was first described by Sir Francis Galton (1886) in a paper called ‘Regression to mediocrity in hereditary stature’. By only offering retests to workers whose initial biomonitoring results were positive, the repeat samples would by definition be lower than the mean of the initial positive results. With 83% of all initial samples under the limit of quantification, the average of the follow-up measurements of workers with positive samples had to be under the limit of quantification as well. This finding was therefore likely not the result of the HSE intervention (SHADs for small and medium-sized body shops where exposure to isocyanates occurred) but rather a case of classical regression to the mean.

I have searched for evidence of similar programs conducted by the HSE in more recent years and found SHADs in agriculture, construction, and boat building. While unable to locate vast numbers of measurements underlying these evidence-based approaches, I did locate a paper by Cherrie (2003; around the time COSHH essentials was introduced in the UK) that noted the following about occupational exposure measurements: ‘In the UK the HSE National Exposure Database (NEDB) contains more than 80,000 measurements for about 400 different substances. However, the majority of these data were collected between about 1985 and 1990, when between 5,000 and 10,000 measurements were added to the database each year. Since then there has been a

fairly steady decline, with currently only a few hundred personal exposure measurements recorded by HSE each year (Philips, personal communication). There are also very few companies measuring exposure to chemicals. In a recent study designed to retrospectively collect exposure data for a small number of commonly used hazardous substances from companies identified as likely users of chemicals, we found that only 3.6% reported having relevant monitoring data (Cherrie *et al.*, 2001). Most surprisingly, in this survey only 41% of professional occupational hygiene consultants had any relevant measurement data.”

Unless Griffin and Curran are able to indicate the whereabouts of the vast number of measurements they claim underlie HSE's policies for SMEs, I will stand by my statement that “Hygiene Without Numbers” comes with a price and we all know who will have to pick up the bill.” (Kromhout 2016).

‘Hygiene Without Numbers’, relying on unsubstantiated best practices not scientifically supported by measurements, should in my opinion not be the way forward. HSE should, however, embrace ‘Hygiene With Numbers’, like the 28 000 measurements of respirable dust and crystalline silica collected since the year 2000 within the often small- and medium-sized sites of the European Industrial Minerals Association’s prospective Dust Monitoring Program (IMA-DMP). These ‘numbers’ have shown and been instrumental in the decreasing exposure to respirable crystalline silica in this sector. Exposures in this industry are now 4 times lower on average than when the programme started 15 years ago (Zilaout *et al.*, 2016). Providing feedback to working populations on their measured exposure, as was recently also shown in a randomized experiment among pig farmers in this journal (Basinas *et al.* 2016), can already result in lower exposure concentrations even without installing extensive exposure controls.

Setting up collaborative programs with industries, where measurements play a prominent role in proving compliance and monitoring temporal changes in concentrations of hazardous workplace exposures, are possible as has been shown in the aforementioned IMA-DMP. On an even bigger scale, the 10-year-old NEPSI project has

shown that estimates of the number of workers exposed to respirable crystalline silica, their exposure levels, and coverage by occupational health care can be generated bottom-up across 15 industry sectors involving 2 million workers from all over Europe.

Having and keeping a clear insight in these numbers are a pre-requisite to protect our workers’ health.

Excellent initiatives like BOHS’ Breathe Freely campaign, in which HSE participates, would be even more effective if supported by data concerning the prevalence and level of workers’ exposures.

## Declaration

The author has no conflict of interest to declare.

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