(aligning & uncertainty of) industrial hygiene risk assessment in civil liability claims & the public debate

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NVvA Conference Session K

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the fact judge

Weighting the uncertainties in disease and the (proportional) relationship with victim's occupational exposure profile.

Industrial hygienist/exposure specialist contributes as an expert to establish the causal strength and to clarify uncertainties

NVvA 2018 mr. Elbert de Jong https://lnkd.in/e29YZTp

Admissibility of a exposure induced health claim

Based in the quality of

1. relation exposure <-> disease (theory)
   - Causal strength
   - Quantitative dose response => Effect Specific Limit Value/Attr. Risk
2. Workers exposure profile (practice)
   - Similar Exposure Group
   - Nature, Level
   - Duration(/task/day/year) => Exposure Pattern
   - Co-exposure (other routes, private)

- Admissibility= Function{ES-LV/AR & SEG-EP}
- *Claim ontvankelijkheid= Functie{grenswaarde, blootstelling & 'politiek'}*

Limited role of Industrial Hygiene

Industrial hygiene is not able to give a consistent and transparent analysis of the exposure and health risk assessment, and its uncertainties

Causality strength health effect & exposure determinants (proposal)

Causal Strength hierarchy (proposal)	
high	Critical effects in OELV documents (Health Council, Doc-TLV, Scoel etc.)
	Evaluation of aggregated EU CLP notifications (Incl Joint Entries) , CLH & Science
	Scientific evaluations of literature in high impact peer review journals
	EU harmonised DSD/CLP classification (CLH)
Middle	REACH registration (full, 100+ t/y of CMR) https://www.echa.europa.eu/information-on-chemicals/registered-substances
	Scientific dose-response/effect publications
	Aggregated ECHA CLP notification (EU 1272/2008)
	(occupational) health casuistic
	'Chemiekaartenboek'; in-company studies, non-public, abstracts, conference presentation
low	Hear say, social media ('facebook') or unknown

Cr(VI) causal strength

High (undisputed):

- IARC (2012) cancer: nose, nasal sinus, lung
- ATSDR (2012) skin contact: allergic eczema
- CLP notified & Harmonized (ID=024-017-00-8)
  - H350i Cancer inhalation
  - H317 Skin Sens. 1

Middle

- COPD, Rhinitus, astma through inhalation
- Stomach cancer, reproduction, development (route??)

TNO 2017 R10148

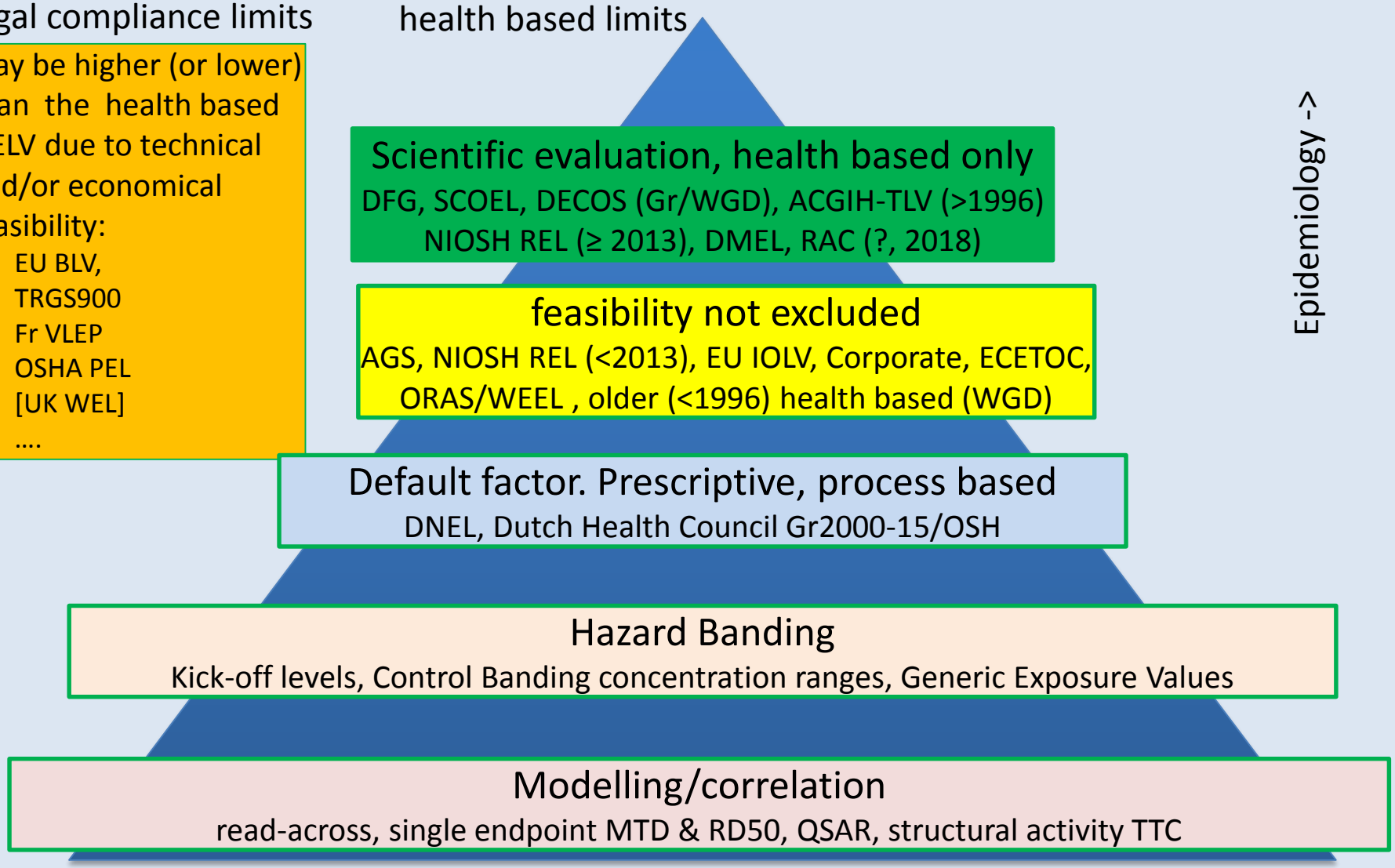
Quality of OELV

legal compliance limits

may be higher (or lower) than the health based OELV due to technical and/or economical feasibility:

- EU BLV,
- TRGS900
- Fr VLEP
- OSHA PEL
- [UK WEL]
- ….

health based limits



Epidemiology ->

Data rich ->

<-Data poor

expert judgment (Nano)

TSAC, DOHSBase & The Global Landscape of Occupational Exposure Limits—Implementation of Harmonization Principles to Guide Limit Selection. M. Deveau, C-P Chen, G. Johanson, D. Krewski, A. Maier, K. J. Niven, S. Ripple, P. A. Schulte, J. Silk, J. H. Urbanus, D. M. Zalk & R. W. Niemeier, JOEH, 12:sup1, S127-S144, DOI: 10.1080/15459624.2015.1060327

Specificity of the OELV

Effect Specific OELV

- A limit value for a specific effect and a specified substance

In example

- Asbest & mesothelioma
- Vinylchloride Monomer and Heamangiosarcoma
- Benzene & Haemopoietic effects (Lead)
- ‘Solvents’ and ‘CTE/OPS’ (CS_2, Manganese, Hg, Pb)

CTE/OPS & Solvents

n-Heptan 142-82-5
n-Hexan 110-54-3
2-Butanon 78-93-3
2-Hexanon 591-78-6
Ethanol 64-17-5
Methanol 67-56-1

2-Methoxyethanol 109-86-4
Styrol 100-42-5
Toluol 108-88-3
Xylol (Gemisch, o-, m-, p-)
1330-20-7, 95-47-6
108-38-3 106-42-3

Dichlormethan 75-09-2
Tetrachlorethen 127-18-4
Benzol 71-43-2
1,1,1-Trichlorethan 71-55-6
Trichlorethen 79-01-6

Tabelle 28: Liste von [~60] nach REACH-Verordnung registrierten Kohlenwasserstoffgemischen

Exposure assessment strength

Exposure assessment strength for liability claims (long-term effects)	
high	Long-term PAS/BM sampling programs (NvvA-BOHS 2011) and recording (NVvA)
	Incidental sampling (CEN 689 n≥6) combined with modelling (different approaches Trexmo)
	publications on exposure patterns of specific profiles in high impact peer review journals
middle	Exposure databases (MEGA, Solvex, NEDB, OSHA)
	Incidental sampling (CEN 689 N<6)
	Modelling only
low	Conflicting exposure information based on interviews only

Exposure data libraries

- Large databases (MEGA, SCOLA, Solvex, COLCHIC, OSHA CEHD, NEDB)
- Numerous smaller databases (Health services, companies, consultants)
- Literature Kromhout (1993)/Symansky (2006)
- Tielemans (2006)

DGUV BK 1317 Tabelle 29: Anzahl von Messwerten für Kohlenwasserstoffgemische, additiv-frei, im Datenzeitraum von 2003 von 2007, (s 76):

Branchen/Arbeitsbereichsgruppe	Anzahl Messwerte
Farbspritzen (Metallbe- und -verarbeitung sowie Maschinenbau)	186

http://epicea.inrs.fr/solvex/Solvex.nsf/

Exposure models

Predict location (GM/AM), hardly dispersion (GSD)

Discussion

- Lack of quality & transparency contributes to IH's submissive role in liability claims & public debate on risk of chemical exposure.
- A guideline on ranking the Exposure assessment ** elements may be helpful

- Claim ontvankelijkheid= Functie{'blootstelling', 'grenswaarde' & 'politiek'}

- When working for one of the parties involved in a claim hygienist should be aware of there ethical, professional code.

back

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DEVELOPMENT OF EFFECT-SPECIFIC LIMIT VALUES (ESLVs) FOR SOLVENT MIXTURES IN PAINTING

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