

# SENSITISING SUBSTANCES IN SMALL ENTERPRISES



## Risks and preventive measures

FÜR EIN GESUNDES BERUFSLEBEN

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 **BGW**  
Berufsgenossenschaft  
für Gesundheitsdienst  
und Wohlfahrtspflege

# Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtspflege (BGW)



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BGW Headquarter, Hamburg

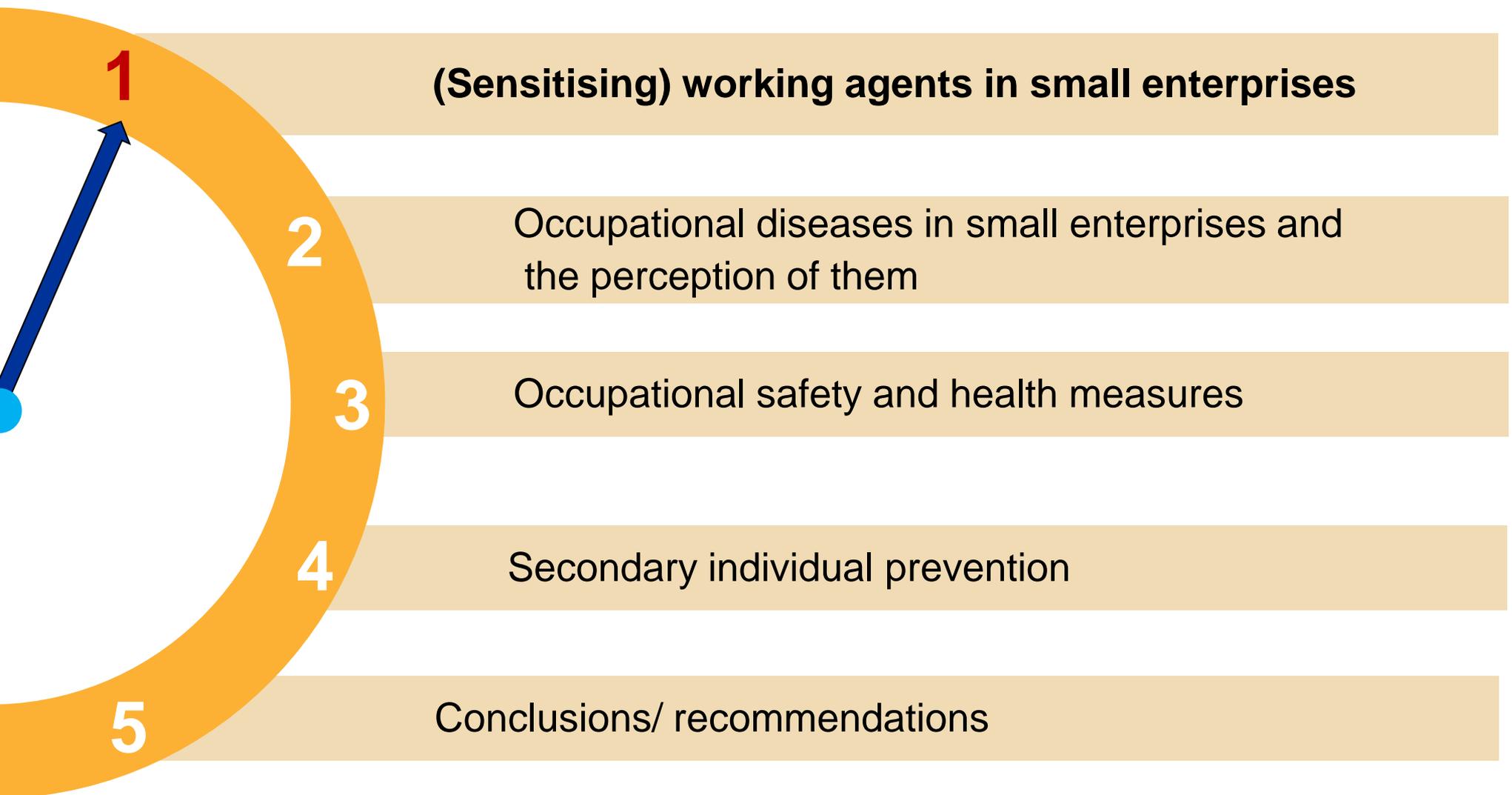
- German Social Accident Insurance Institution for the Health and Welfare Services
- approx. 650.000 member companies
- > 7 million insured employees
- insured sectors (examples):
  - ➔ Hospitals
  - ➔ Doctors' practices
  - ➔ Inpatient care/ home care
  - ➔ Pharmacies
  - ➔ Hairdressers
  - ➔ Pest control

# BGW / Hazardous substances & toxicology section



- ➔ Part of the Health Science and Occupational Medicine Department
- ➔ Located in Cologne
- ➔ Chemists, engineers, technicians, administrative assistants
- ➔ **Main focus:** chemical hazards in the health services  
(disinfectants, pharmaceuticals, anesthetic gases, cytotoxic substances, sterilising agents etc.)

# Topics



## Selected small enterprises in the BGW

Sector	Number (2014)		
	Enterprises	Company sites	Insured individuals
Pharmacies	16.813	21.009	263.514
Doctors' practices / laboratories	116.508	118.846	822.193
Dentists' practices	43.874	44.554	392.452
Veterinary practices / pest control companies	14.029	14.323	52.508
Hairdressers	72.670	83.278	328.130
<b>Total</b>	<b>263.894</b>	<b>282.010</b>	<b>1.858.797</b>
<b>% BGW</b>	<b>42,39</b>	<b>39,62</b>	<b>24,05</b>

# Working agents in selected BGW sectors

Working agents	Pharmacies	Doctors' practices	Dentists' practices	Veterinary practices	Hair-dressers
Office materials (paper, photocopying materials)	X	X	X	X	(X)
Cleaning agents	X	X	X	X	X
Disinfectants	X	X	X	X	(X)
Medicinal substances	X			(X)	
Pharmaceuticals	X	X	X	X	
Diagnostic agents		X		X	
Laboratory chemicals	X	(X)			
Preservatives		(X)		X	
Gloves	X	X	X	X	X
Disposable materials		X	(X)	X	
Cosmetics (general)					(X)
Hair (animal, human)				X	X
Hair-treatment agents					X
Technical products (paints, oil, grease, petrol)	(X)	(X)	(X)	X	(X)

# Disinfectants: typical ingredients

- Approx. 1000 different products analysed
- Active substances (aldehydes, alcohols, quaternary ammonium compounds, biguanides, alkylamines, etc.), solvents, surfactants, perfumes

**Over 200 different ingredients in total were identified.**

Ingredient	CAS No	Number of indications				
		Total	Surface	Skin-/hands	Instruments	Linen
2-Propanol	67-63-0	331	181	102	47	1
Ethanol	64-17-5	187	135	35	14	3
Didecyl dimethyl ammonium chloride	7173-51-5	182	166		16	
1-Propanol	71-23-8	128	87	31	10	
Quaternary ammonium compounds	68391-01-5	108	95		13	
N-(3-Aminopropyl)-N-dodecylpropane-1,3-diamine	2372-82-9	90	39		51	
Glutaraldehyde	111-30-8	68	40		28	
Isotridecanol, ethoxylated	69011-36-5	62	42		16	4

# Disinfectants: Ingredients and their synonyms

Designation of product ingredients by manufacturer:

## ■ Use of synonyms (up to 15 different)

### Examples

- ▶ **Piperazine**
- ▶ Piperazinhexahydrid
- ▶ Diethylenediamine
- ▶ Lumbricol
- ▶ 1,4-Diazacyclohexane
- ▶ **Glyoxal**
- ▶ Diformyl
- ▶ 1,2-Ethanedial
- ▶ 1,2-Ethanedione
- ▶ Oxal aldehyde
- ▶ Glyoxal aldehyde

## ■ Use of vague terms

- ▶ Alkansulfonat
- ▶ Biguanid-Derivat
- ▶ Colours/ Perfume
- ▶ Guanidine compounds
- ▶ Amine derivates
- ▶ Organic acids
- ▶ Quat. ammonium compounds

# DESINFO evaluation: sensitising ingredients

CAS No	Name (other synonyms are possible)	Test series	Classification
107-22-2	Glyoxal	DKG DES	H317 / R43
111-30-8	Glutaraldehyde	DKG DES	H314 + H334 / R42/43
25655-41-8	Povidone iodine	DKG DES	
50-00-0	Formaldehyde	DKG S	H317 / R43
61789-40-0	Cocamidoproyl betaine	DKG F, KH	
68391-01-5	Benzalkonium chloride	DKG DES	
127-65-1	Sodium-p-toluolenesulfon-chloramide		H334 / R42
3586-55-8	1,6-Dihydroxy-2,5-dioxahexane		H317 / R43
59-50-7	4-Chloro-3-methylphenol		H317 / R43
110-85-0	Piperazine		H314 + H334 / R42/43

# DESINFO: formaldehyde releaser

## Non declared formaldehyde in disinfectants

Example: **Kxxxxxx extra**

	Active Substances	concentration [g/100 g]
Declaration manufacturer	(Ethylenedioxy)dimethanol	14,1
	Glutaraldehyde	5,0
	Didecyl dimethyl ammonium chloride	8,0
Analysis by DGUV/IFA	<b>Formaldehyde</b>	4,6
	<b>Glutaraldehyde</b>	3,1

(Ethylenedioxy)dimethanol [CAS-No. 3586-55-8]

**Synonyms:** 1,6-Dihydroxy-2,5-dioxahexane

1,2-Ethanediylbis (oxy)-bis-methanol

# Topics



# Accidents and occupational diseases at the BGW

Sector	Number (2014)		
	Occupational accidents	Commuting accidents	Diseases
Pharmacies	872	689	63
Doctors' practices / laboratories	1,890	2,319	733
Dentists' practices	1,028	1,124	613
Veterinary practices / pest control companies	1,554	140	101
Hairdressers	1,699	963	1432
<b>Total</b>	<b>7,043</b>	<b>5,235</b>	<b>2,942</b>
<b>% BGW</b>	<b>9.78</b>	<b>17.92</b>	<b>23.37</b>

## Items triggering disease (occupational disease (BK) codes 5101, 4301, 4302) in the BGW's statistics (2006-2014)

	Pharmacies [%]	Doctors' practices [%]	Dentists' practices [%]	Veterinary practices [%]	Hair- dressers [%]
Rubber, rubber ingredients, latex	2.26	2.77	2.84	2.14	0.4
Resin / oil / natural substances	2.63	0.07	0.33	0.8	0.29
Disinfectants / preservatives	<b>34.96</b>	<b>44.64</b>	<b>38.82</b>	<b>31.28</b>	2.32
Medicinal substances /pharmaceuticals	4.9	1.14	0.43	1.1	-
Hair-treatment agents	-	-	-	-	<b>36.60</b>
Cleaning agents	6.39	2.96	2.61	1.07	1.14
Water	<b>27</b>	<b>23.2</b>	<b>22.7</b>	<b>18.2</b>	<b>24</b>
Specific chemical compounds	7.9	7.98	<b>13.44</b>	6.95	7.61
Hair, bristles, feathers etc. (animal /human)	-	0.1	-	<b>23.3</b>	0.6
<b>Total</b>	<b>86.04</b>	<b>82.86</b>	<b>81.17</b>	<b>84.84</b>	<b>72.96</b>
Not stated	8.6	10.2	10.5	13.6	20.2

# Diseases of the skin and respiratory tract (BGW, 2014)

BGW (mandatory reporting)	Occupational disease (BK) code	Figures (2014)
Skin diseases	5101	7229
Diseases of the respiratory tract	4301/4302	437

- Insured individuals (2014) = 7.729 million
- **Reporting proportion, skin** = 0.094% p.a.
  - = **3.76 % per working life (40 yrs)**
  - = 18.8 % per 5 employees
- **Reporting proportion, respiratory tract** = 0.0057% p.a.
  - = **0.23 % per working life (40 yrs)**
  - = 1.15 % per 5 employees

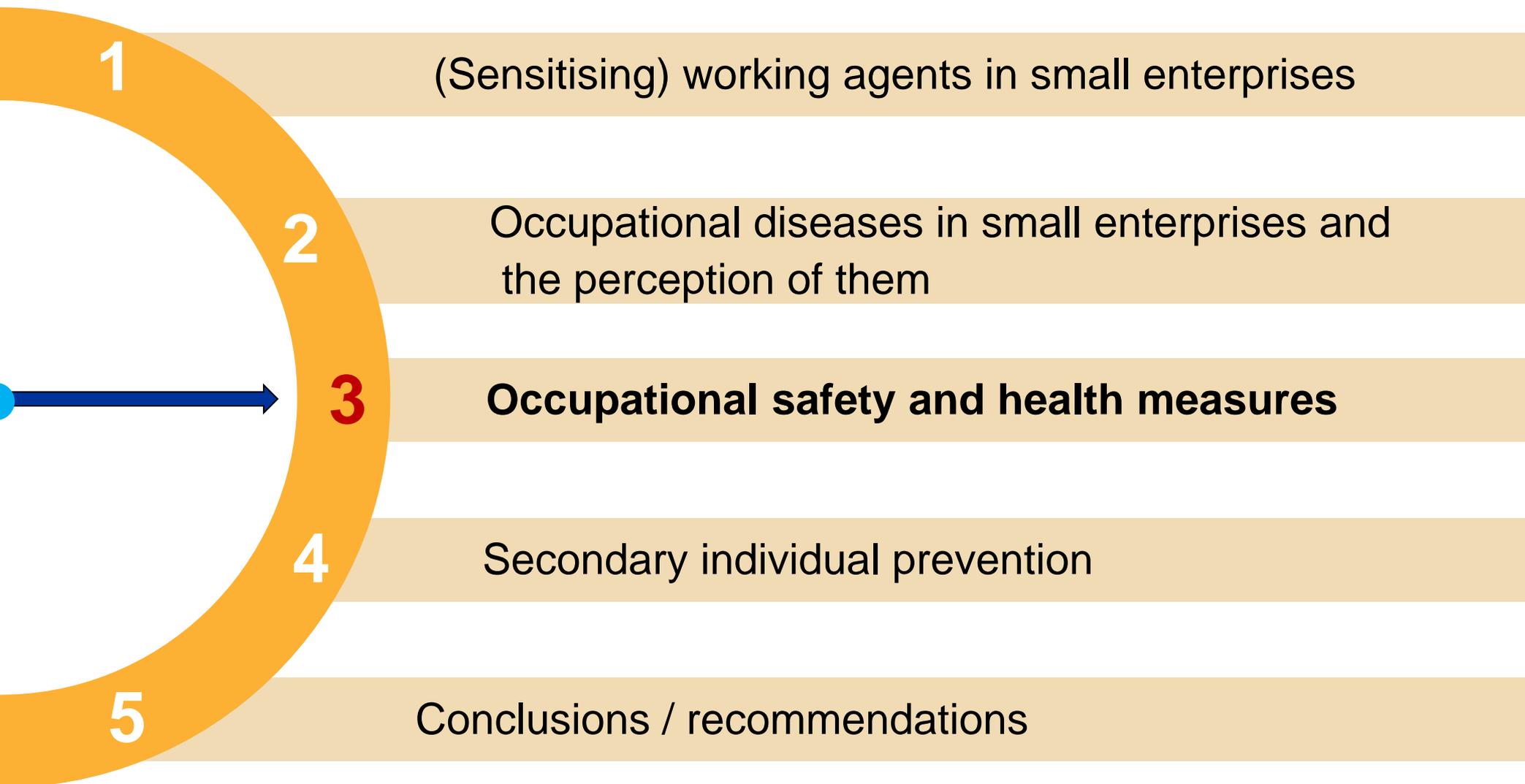
# Conclusion: sensitising substances in small enterprises

- Lay persons are often unable to identify potentially sensitising working agents as such.
- Classification and labelling of products is only a partial solution (problem: pharmaceuticals, cosmetics, commodities, etc.).
- Diseases of the skin and respiratory tract are not sufficiently frequent to lead to greater attention being paid to protective measures in small enterprises.

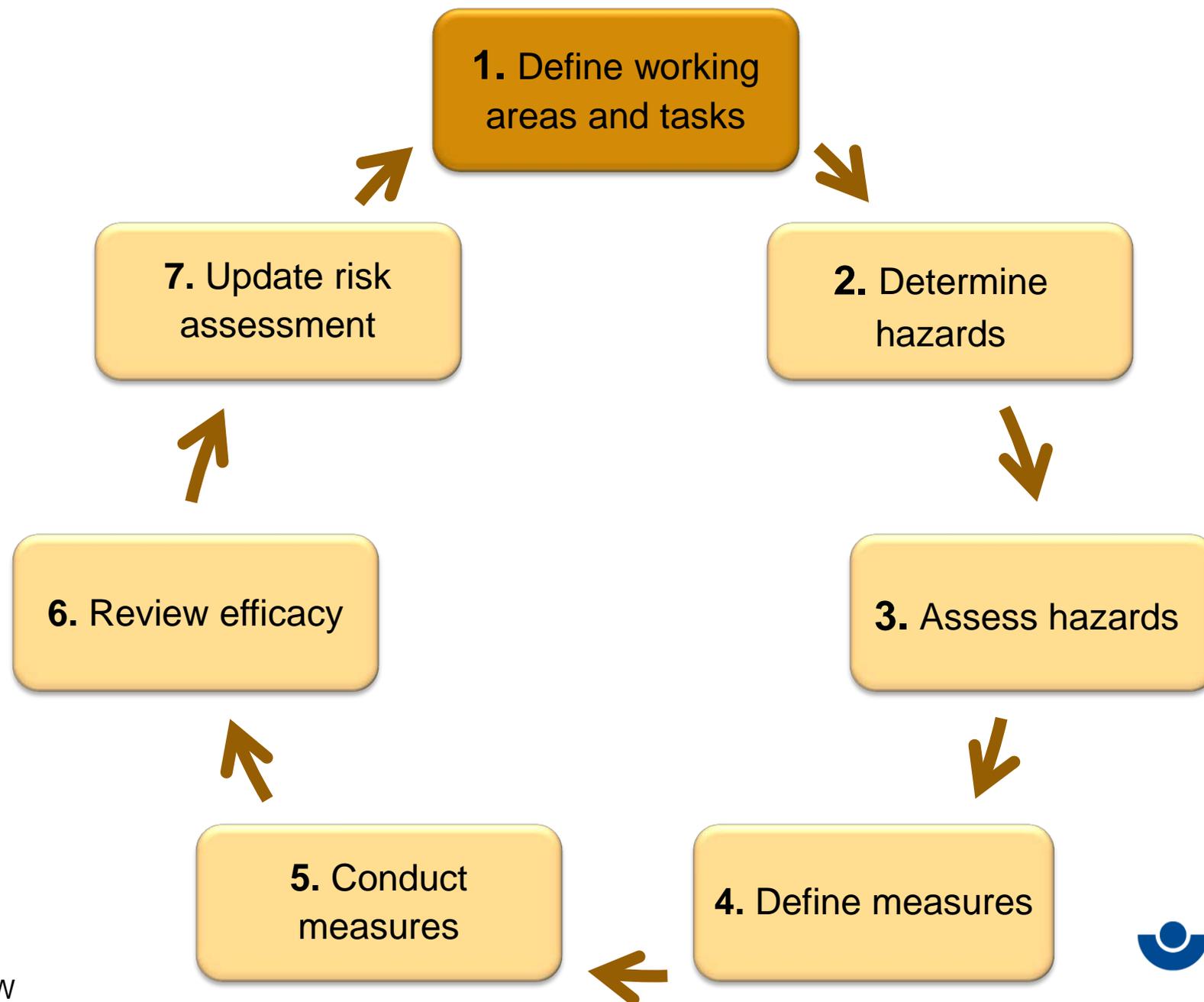
**Example:**  
Hairdressers in Germany  
Measures for protection against  
sensitisation are rarely applied



# Topics



# Risk assessment: action cycle



# Risk assessment: preparation

- Involvement of experts (OSH professionals, occupational physicians, occupational hygienists)
- *Incidence and severity of accidents and disease in small enterprises*
- Compilation of materials:
  - ➔ Descriptions of substances, e.g. material safety data sheets
  - ➔ Task descriptions, e.g. from quality management
- *In-house exposure data (e.g. from measurements)*
- *Conclusions from preventive occupational medical care*

# Risk assessment: exposure assessment

## Dermal exposure:

- No limit values for dermal exposure
- Dermal exposure can generally be described only in qualitative terms (data scatter (RISKOFDERM), comparability of measurement methods)
- In Germany: system of classification according to a small number of parameters: substance, quantity, duration

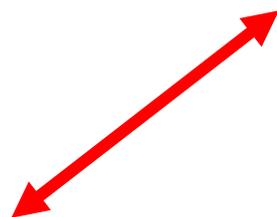
## Inhalative exposure:

- Occupational exposure limits for atmospheric exposure are not generally geared to the potential for sensitisation
- Quantification by atmospheric measurements is not usually helpful

# Risk assessment: protective measures

- **S**ubstitution
- **T**echnical measures
- **O**rganizational measures
- **P**ersonal measures

- Expertise
- State of the art
- Dependent upon the sector
- Based upon:
  - *Measurements*
  - *Experience in the sector*

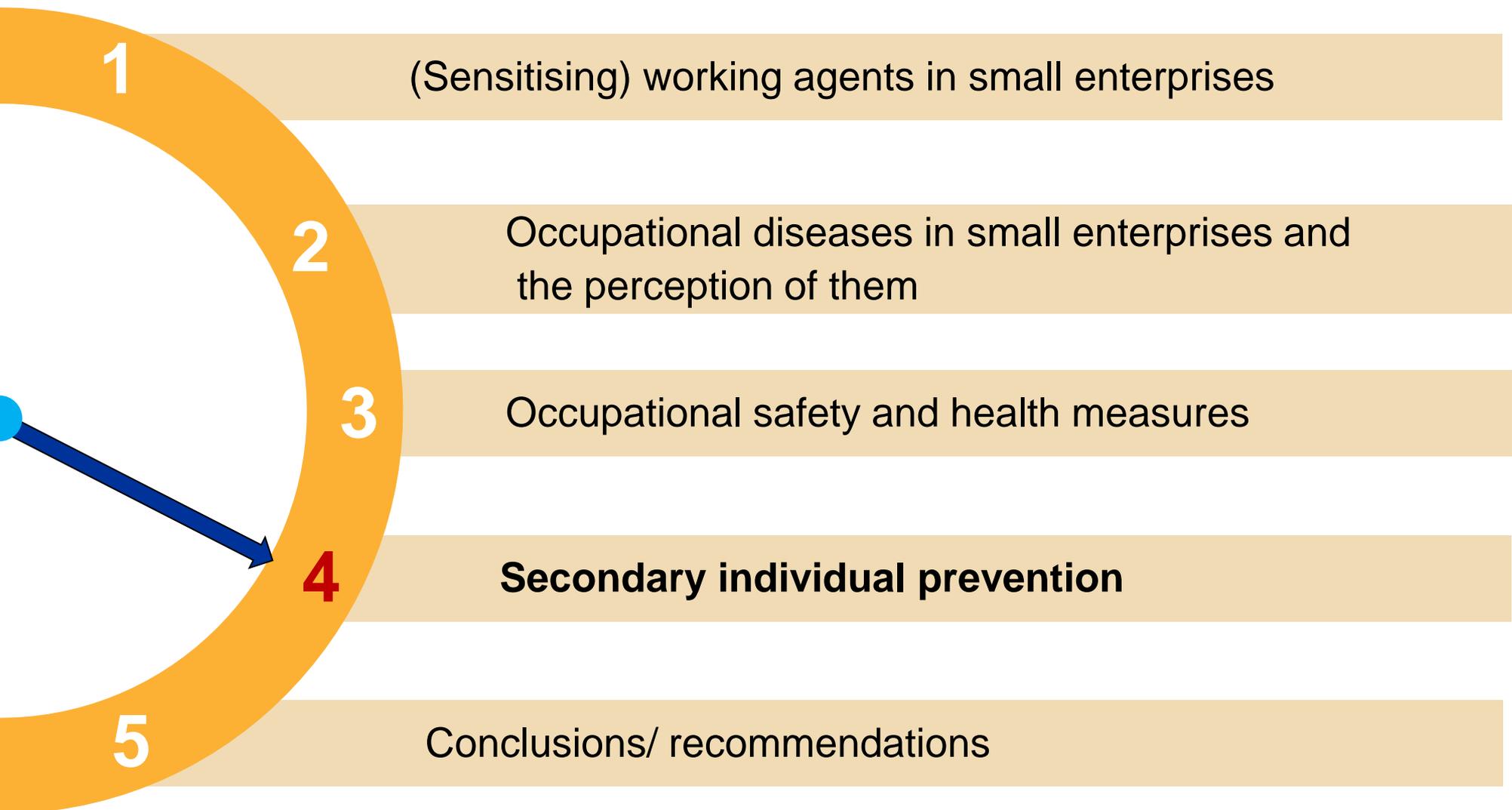


Sector-specific guides  
(sector-specific solutions)

# Sector-specific guides for small enterprises (examples, Germany)

Sector	TRGS technical rules for hazardous substances	Sector-specific guides / information (examples)
Doctors' practices Pharmacies etc.	TRGS 525 „Hazardous Substances in medical facilities“	DGUV-I 107-002 „Disinfection task in the health sector“  DGUV-I 207-007 „Working safely with cytotoxic drugs“
Hairdressers	TRGS 530 „Hairdressing sector“	BGW TP-9GB „Risk assessment for hairdressers“  BGW TP-HSP-9 „Skin-protection plan“

# Topics



# Primary and secondary prevention

## PRIMARY PREVENTION

Is intended to prevent the incidence of diseases by eliminating the causes

### EXAMPLE

Reduction of chromate in cement-based working agents in order to prevent chromate eczema

## SECONDARY PREVENTION

Is intended to prevent progression from early stages of the disease

### EXAMPLE

Measures triggered by the dermatologist for personal protection of the skin (individual secondary prevention)

# Secondary personal prevention (BGW)

- Availability of **medical consultations on skin and the respiratory tract** for clarification of uncertain individual diagnoses concerning the skin and respiratory tract

**BGW figures:** >1,700 consultations per year

- Availability of seminars on **behavioural prevention**, e.g. among hairdressers

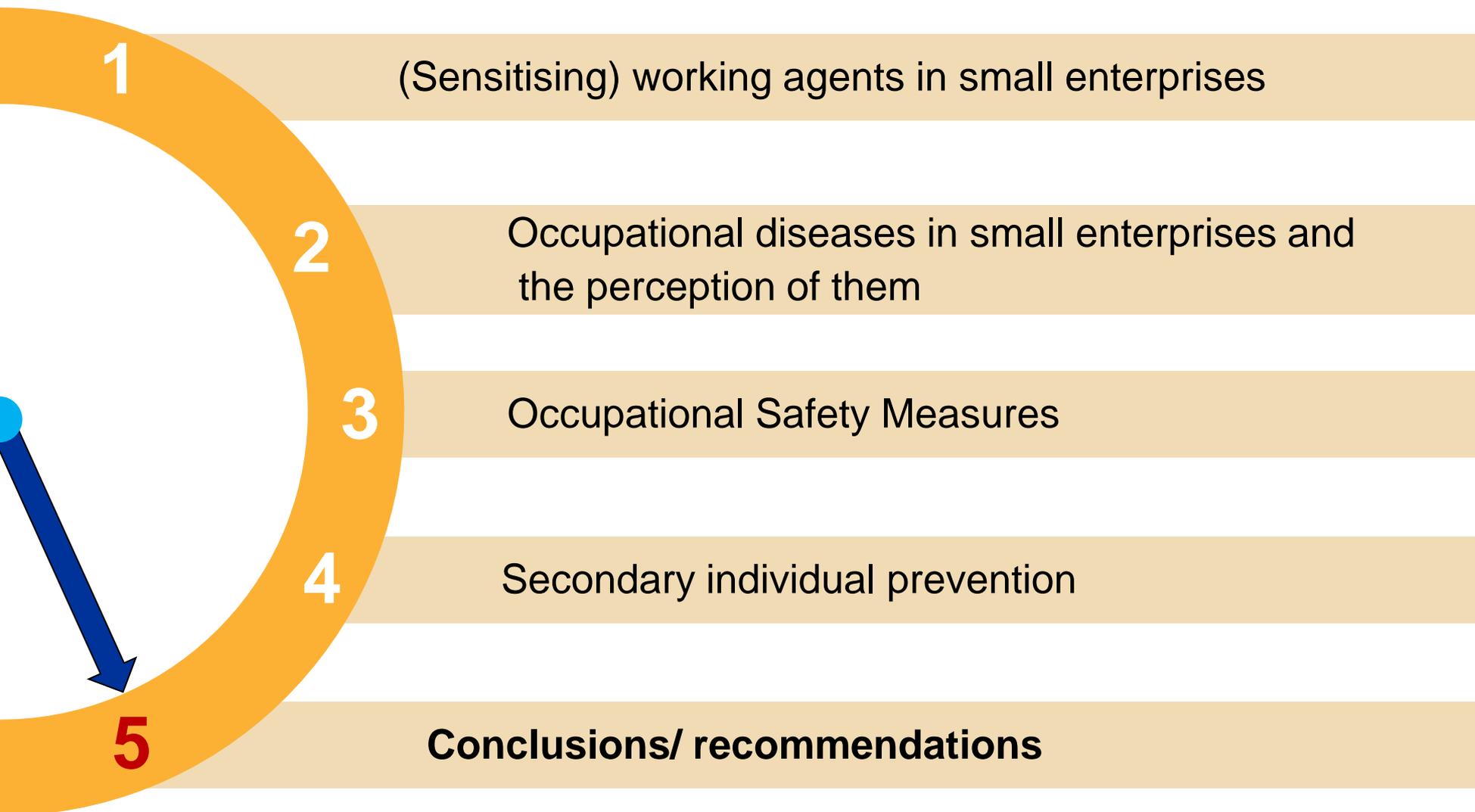
**Topics:** e.g. wearing of PPE, correct working practices

- Consultations in the company in which the individual suffering the disease works, for the purpose of **circumstantial prevention**

**Example topic:**

- substitution of products
- technical optimization
- personalized workplace design

# Topics



# Conclusions / recommendations

- Sensitisation is difficult to prevent in small enterprises.
- First priority: the **substitution** of hazardous substances with sensitizing properties
- Employers require **sound information**  
(on chemical substances, appropriate preventive measures)
- **Sectoral information** from the national OSH institutions and professional associations (e.g. on the state of the art) is recommended
- **Monitoring** of OSH standards by official bodies can motivate enterprises to conduct high-quality risk assessment.

# Merci beaucoup pour votre attention!

# Thank you for your attention!

Vielen Dank für Ihre Aufmerksamkeit!



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