

11th ICdA- H&S C^{tee}

June 5th 2013

Statement of Compliance

- ❑ The purpose of the meeting is to address, under the applicable confidentiality rules, issues concerning cadmium and cadmium compounds producers and users and more particularly H&S issues, as reported in the Meeting's objectives .
- ❑ The minutes kept at the meeting will have to reflect all significant matters discussed during the meeting.
- ❑ No discussions will be held, formally or informally, during specified meeting times or otherwise, involving, directly or indirectly, express or implicit agreements or understandings related to: (a) any company's price; (b) any company's terms or conditions of sale; (c) any company's production or sales levels; (d) any company's wages or salaries; (e) the division or allocation of customers or geographic markets; or (f) customer or suppliers boycotts; or (g) any disclosure of information which may affect applicable rules on Competition Law.
- ❑ The International Cadmium Association, as a group will make no recommendations of any kind and will not try to reach any agreements or understandings with respect to an individual company's prices, terms or conditions of sale, production or sales levels, wages, salaries, customers or suppliers.

Objective of H&S Com meetings

□ Reminder:

- The H&S Ctee was set up **primarily** to assist ICdA members with the implementation of the ICdA Guidance document

"ICdA Guidance on the management of the risk related to chronic occupational exposure to cadmium and its compounds"

□ Source of this initiative:

- Cd/CdO risk assessment (RA) showed a risk-conclusion for workers under current management methodologies (2007)
- Under the current "REACH" regulation, the same "risk management precautions" apply, for Workers and for the Environment

Past (and future) H&S Ctees

- ❑ Launch of the committee, definition of the format and content
 - 1st Ctee, dated Nov 25th, 2008
- ❑ Measuring air quality
 - 2nd Ctee, dated March 10th, 2009
- ❑ Medical supervision adapted to cadmium risk
 - 3rd Ctee, dated June 16th 2009
- ❑ Individual and collective hygiene procedures
 - 4th Ctee, dated October 13th 2010
- ❑ Detailed procedures regarding medical surveillance
 - 5th Ctee, dated June 8th: 2010
- ❑ Status a the REACH registration process
 - 6th Ctee, dated October 15th, 2010
- ❑ Choosing and maintaining the right PPE
 - 7th Ctee, dated June 7th, 2011
- ❑ Implementing a prevention culture in our facilities
 - 8th Ctee, dated October 15th, 2011
- ❑ Communication flyers and Guidance ICdA
 - 9th Ctee, dated June 17th, 2012
- ❑ Water treatment- emissions minimization
 - 10th Ctee, dated October 23th , 2012
- ❑ **Risk control improvements & committments: Guidance, targets and monitoring**
 - **11th Ctee June 5th , 2013**
- ❑ Next meeting (tbd)
 - 12th Ctee, date to be set

Agenda for Today's meeting

- ❑ Introduction:
 - Welcome / Competition law compliance
 - Objectives of the meeting: Risk control improvements & commitment
 - Agenda
- ❑ Approval of the minutes of the 10th H&S committee (October 2012)
- ❑ Review of the comments submitted by ICdA, during the recent Public Consultation, regarding the Annexes XV (Cd & CdO) issued by Sweden as support for their proposal to include those substances in the SVHC-candidate list
- ❑ Review & discussion of the biomonitoring-2012 exercise (OCdBIO-5)
- ❑ Review & discussion of the 2013-revised "ICdA guidance on risk-management of Cd"
- ❑ Organization of a collective commitment to achieve challenging targets in terms of bio-monitoring results of the EU-workforce potentially exposed to cadmium
- ❑ Organization of practical measurements and systematic reporting of Cd-in air on the workplace (expressed in 'respirable ug Cd/m³') in order to proof the general compliance, on the field, with the REACH-chosen DNEL (4ug/m³, respirable fraction)
- ❑ Other business
- ❑ Setting of the 12th H&S committee and ... longer term planning

ICdA comments on Cd/CdO Annex XV dossiers Sweden

Cd & CdO are proposed to be included as SHVC in the « candidate list »

- Sweden confirmed, on 04/02/2013 its proposal to include Cd and CdO in the 'SVHC candidate list'
 - A public consultation (45d) for the Annexes XV issued by Sweden from 4/03 till 18/04/2013
 - Comments submitted by ICdA in due time
 - Overview of all received comments is distributed early May to the MSC members (30d consultation)
 - Opinion of MSC is expected in the course of June
 - 'Candidate listing' will probably occur in July-August of this year

Annex XV dossiers were prepared and submitted by Sweden -SVHC

- The 2 Swedish Annex XV-dossiers start with the proposal to identify both substances:
 - As meeting the criterion of Article 57 (a) of the REACH Regulation owing to its **classification as carcinogen 1B** and
 - As meeting the criterion of Article 57 (f) of REACH owing to the adverse effects on kidney and bone tissue after repeated exposure and the **related classification STOT RE1** (for specific target organ toxicity after repeated exposure)

Basis of the Annex XV dossiers

- The said Annex XV-dossiers articulate around:
 - A first type of concern: General population exposed, and potentially at risk, through the Environment
 - A second type of concern: General population exposed and at risk due to cadmium presence in manufactured Articles
 - A third type of concern: Occupational exposure of workers to cadmium
 - In an appendix, it is even alledged that cadmium might induce some 'endocrine disrupting' effects

ICdA comments on the Swedish Annex XV dossiers (1)

- Our comments were structured to (a) respond to each of the wrongly or not documented allegations and (b) provide elements that might be taken into account later in a prioritization phase:
 - No discussion about 57 (a) but we challenged the 57 (f) criterium due to non-adequacy of CdU-data in $<1\mu\text{g Cd/g creat.}$ for general population as indicator of kidney affections
 - Cadmium ingested by general population is coming from the food chain, essentially due to (1) Cd-presence in fertilizers (natural impurity in phosphate-rocks) and (2) atmospheric deposition of Cd from steel mills coal, power plants fuels, NF-smelters, glass & cement manufacturers. Authorization procedure will have no effect at-all on that exposure route
 - Cadmium exposure to the general population through the main transfer pathways (food) is lower than the WHO standards and even lower than the conservative EU (EFSA) standards

ICdA comments on the Swedish Annex XV dossiers (2)

- Examples of uses were commented or challenged when incorrectly referenced e.g. some 'Intermediate uses' , automobile brake pads, portable Ni-Cd batteries, ...
- 200,000 workers are claimed to be occupationally exposed to cadmium; we estimated the number today at 2500-3500, for industries using effectively and intentionally cadmium in their facilities. We claim those workers are adequately protected against Cd-risks (cfr. OCdBIO data)
- In appendix: endocrine effects:
 - Swedish epi studies showing associations between estimated dietary exposure and increased risk of endometrial cancers. Even Annex XV itself indicates this needs to be confirmed by other studies.
 - In our comments we emphasized that, before any conclusion can be drawn, more *in vivo* research is needed on: the mechanism of interaction between Cd and oestrogen signalling, biologically active species of Cd and biomarkers of oestrogen-like effects of Cd.

OCdBIO -Occupational Cadmium Bio-monitoring Observatory

OCdBIO -Occupational Cadmium Bio-monitoring Observatory

- ❑ Since 2008, Cd biomonitoring data is collected in the Cd industry in order to convince ourselves and authorities on
 - ✓ the efficiency of our risk management program
 - ✓ the compliance of the current exposure levels with the OELs
- ❑ It is interesting for ICdA members to compare their own data with aggregated data from the whole Cd using industry
- ❑ A follow-up is interesting only if there is a long-term involvement of the companies (at least 3 years: 2008-2010; currently 5 years follow-up!)

Selected biomarkers of exposure

- ❑ Cadmium in blood – CdB: indicator of recent exposure
 - Cadmium in blood ($\mu\text{g/L}$)
- ❑ Cadmium in urine – CdU: biomarker of the amount of Cd stored in the body and in particular in the kidney cortex where the first signs of Cd toxicity develop
 - Cadmium in urine ($\mu\text{g/g}$ creatinine)

EU-Sites concerned

EU-sites	Responded		
Nyrstar – Auby (F)	X	Boleslav (Po)	
Nyrstar- Budel (NL)	X	OCK (Bu)	
Nyrstar – Balen (B)	X	Copsa-Mica (Ro)	
Nyrstar – Overpelt (B)	X		
Xstrata- Nordenham (Ge)	X		
Xstrata – San Juan (Sp)	X		
Boliden- Odda (No)	X		
Boliden – Kokkola (Fi)	X		
KCM – Plovdiv (Bu)	X		
Porto-Vesme – (It)	X		
Miasteczko (Po)	(X)		
Silesia (Po)	X		
Floridienne – Ath (Be)	X		
Accurec - .. (Ge)	X		
SNAM - Viviez (F)	X		
SAFT – Bordeaux (F)	X		
SAFT – Poitiers (F)	X		
SAFT – Ferak (Cz)	X		
SAFT – Oskarshamm (S)	X		
Hoppeke – Brillon (Ge)	X		
Gas-Enersys (Ge)	X		
Rockwood - (UK)	X		
JMB – (UK)	X		
5NPlus – Eisenhuttenstadt (Ge)	X		
First Solar – (Ge)	X		
Cayxo (Ge)	X		
Euro-Dieuze (F)	X		
Umicore-thin films (Ge)	X(!)		

Biomonitoring of occupational exposure to cadmium

**Louvain Centre for Toxicology and applied Pharmacology
Catholic University of Louvain**

Brussels, June 2013

A. Chaumont & A. Bernard

Distribution of urinary cadmium in EU-sites 2008 - 2009 - 2010 – 2011 - 2012

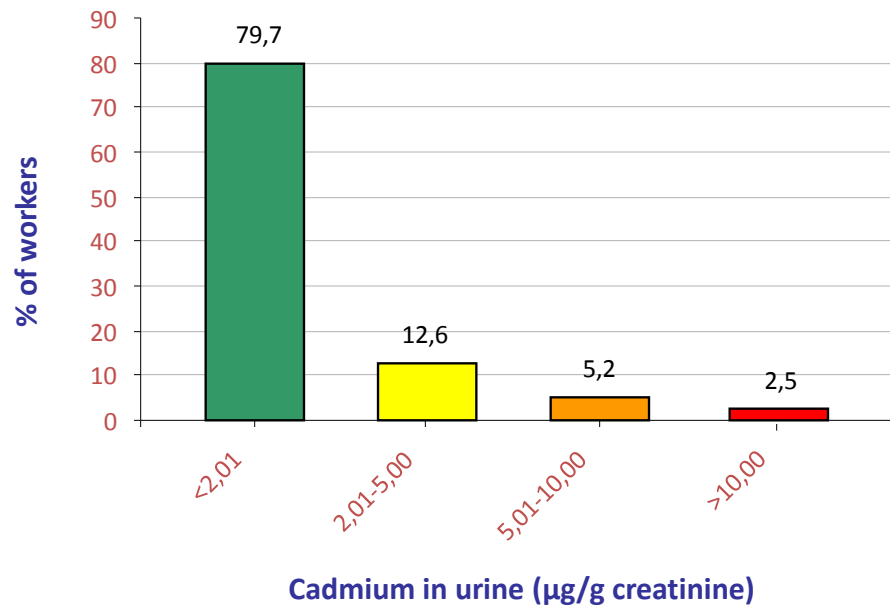
Number of EU-sites included in the Cd biomonitoring:

- 15 EU-sites in 2008
- 17 EU-sites in 2009
- 21 EU-sites in 2010
- 21 EU-sites in 2011
- 25 EU-sites in 2012

	Cd in urine (µg/g creatinine)	2008		2009		2010		2011		2012	
		N	%	N	%	N	%	N	%	N	%
	0.00 - 1.00	1204	65.6	1442	67.9	1599	67.5	1912	72.0	2629	79.8
	1.01 - 2.00	258	14.1	300	14.1	337	14.2	362	13.6	353	10.7
	2.01- 3.00	113	6.2	135	6.4	146	6.2	118	4.4	112	3.4
	3.01 - 5.00	118	6.4	127	6.0	118	5.0	129	4.9	116	3.5
	5.01 - 7.00	56	3.1	50	2.4	59	2.5	46	1.7	28	0.8
	7.01 - 10.00	40	2.2	38	1.8	60	2.5	42	1.6	31	0.9
	>10	46	2.5	33	1.6	51	2.2	47	1.8	27	0.8
	Total	1 835	100	2 125	100	2 370	100	2656	100	3 296	100

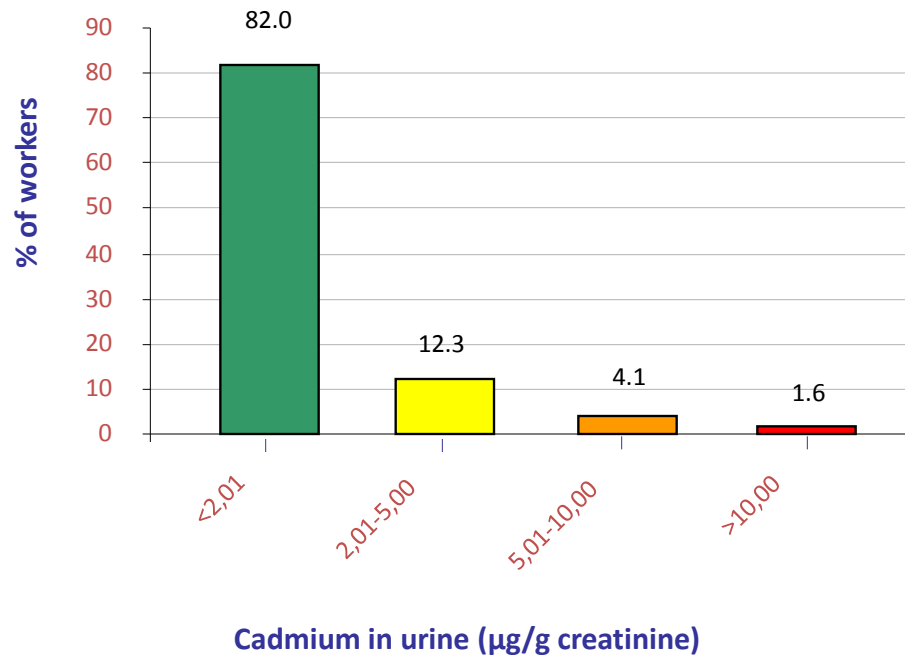
Distribution of urinary cadmium values in EU-sites 2008

	Cd in urine (µg/g creatinine)	2008	
		N	%
	0.00 - 1.00	1204	65.6
	1.01 - 2.00	258	14.1
	2.01 - 3.00	113	6.2
	3.01 - 5.00	118	6.4
	5.01 - 7.00	56	3.1
	7.01 - 10.00	40	2.2
	>10	46	2.5
	Total	1835	100



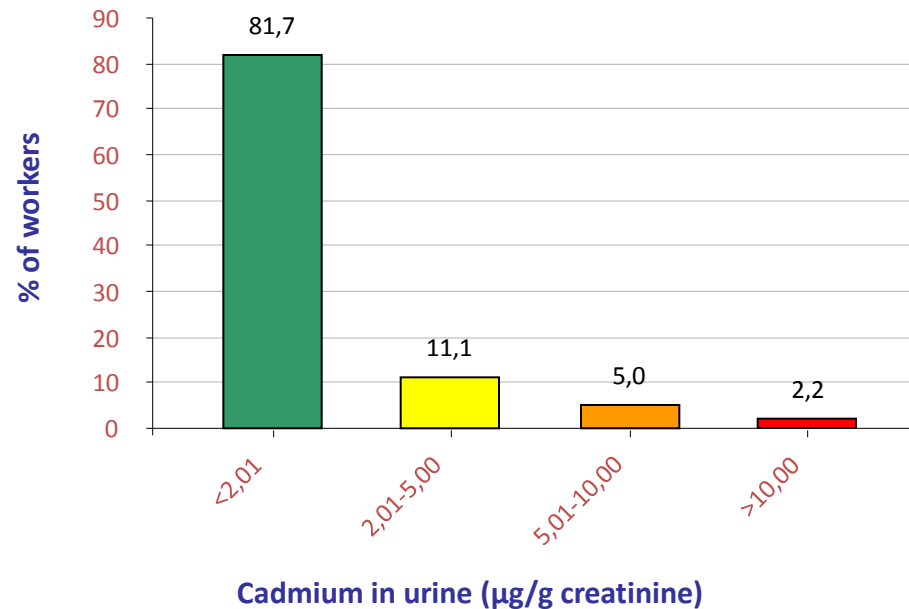
Distribution of urinary cadmium values in EU-sites 2009

	Cd in urine ($\mu\text{g/g}$ creatinine)	2009	
		N	%
	0.00 - 1.00	1442	67.9
	1.01 - 2.00	300	14.1
	2.01 - 3.00	135	6.4
	3.01 - 5.00	127	6.0
	5.01 - 7.00	50	2.4
	7.01 - 10.00	38	1.8
	>10	33	1.6
	Total	2125	100



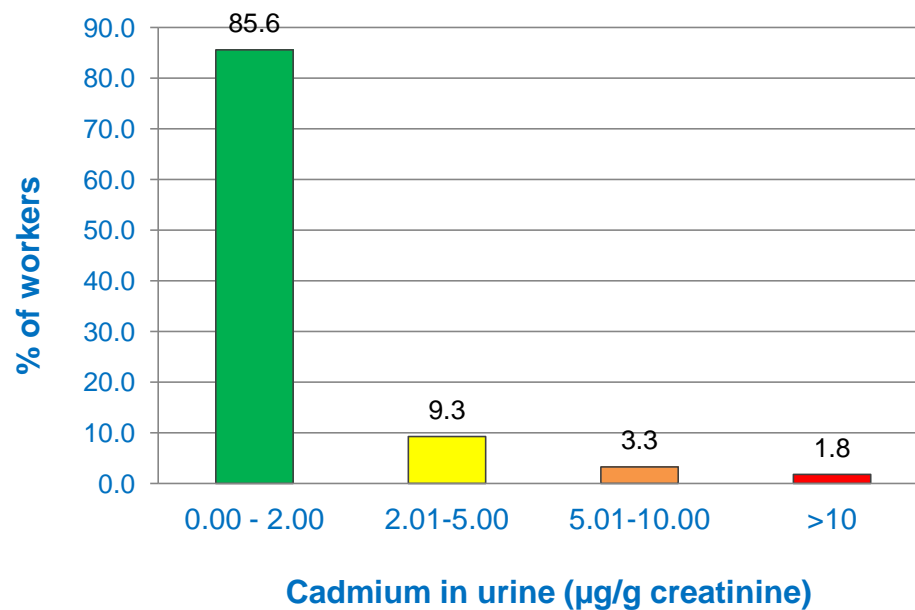
Distribution of urinary cadmium values in EU-sites 2010

	Cd in urine ($\mu\text{g/g}$ creatinine)	2010	
		N	%
	0.00 - 1.00	1599	67.5
	1.01 - 2.00	337	14.2
	2.01 - 3.00	146	6.2
	3.01 - 5.00	118	5.0
	5.01 - 7.00	59	2,5
	7.01 - 10.00	60	2,5
	>10	51	2,2
	Total	2 370	100



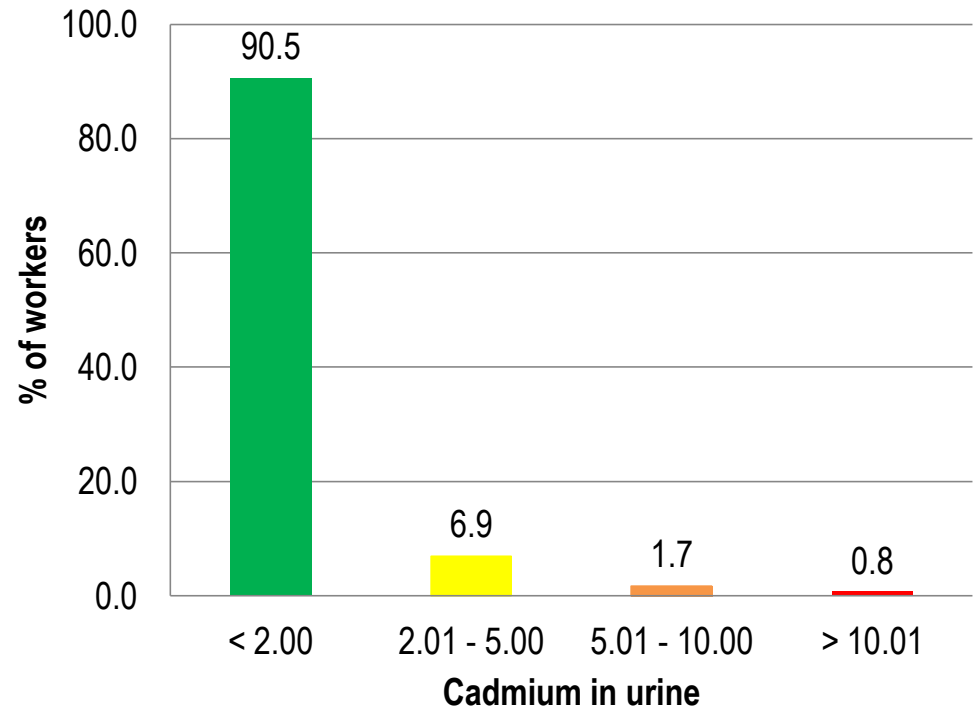
Distribution of urinary cadmium values in EU-sites 2011

	Cd in urine (µg/g creatinine)	2011	
		N	%
	0.00 - 1.00	1912	72.0
	1.01 - 2.00	362	13.6
	2.01 - 3.00	118	4.4
	3.01 - 5.00	129	4.9
	5.01 - 7.00	46	1.7
	7.01 - 10.00	42	1.6
	>10	47	1.8
	Total	2 656	100



Distribution of urinary cadmium values in EU-sites 2012

	Cd in urine (µg/g creatinine)	2012	
		N	%
	0.00 - 1.00	2629	79.8
	1.01 - 2.00	353	10.7
	2.01 - 3.00	112	3.4
	3.01 - 5.00	116	3.5
	5.01 - 7.00	28	0.8
	7.01 - 10.00	31	0.9
	>10	27	0.8
	Total	3 296	100



Distribution of blood cadmium in EU-sites 2008 - 2009 - 2010 – 2011 - 2012

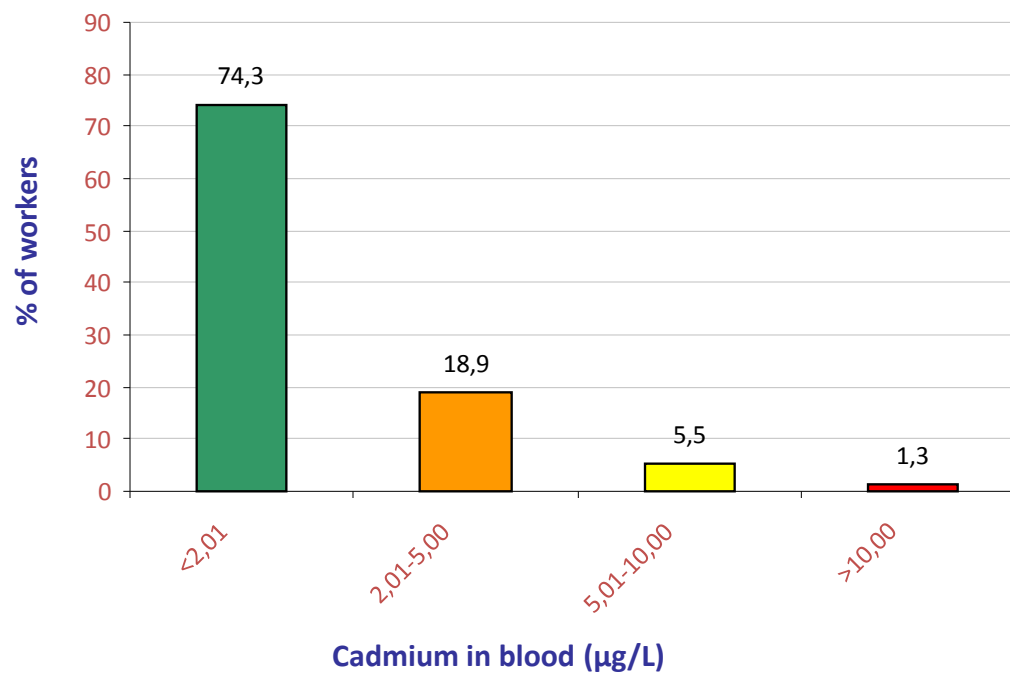
Number of EU-sites included in the Cd biomonitoring:

- 15 EU-sites in 2008
- 16 EU-sites in 2009
- 18 EU-sites in 2010
- 17 EU-sites in 2011
- 20 EU-sites in 2012

	Cd in blood (µg/L)	2008		2009		2010		2011		2012	
		N	%	N	%	N	%	N	%	N	%
	0.00 - 2.00	1332	74.3	1332	73.0	1511	73.4	1831	76.0	2097	79.8
	2.01 - 3.00	177	9.9	195	10.7	232	11,3	259	10.8	225	8.6
	3.01- 5.00	162	9.0	174	9.5	173	8,4	183	7.6	172	6.5
	5.01 - 7.00	55	3.1	72	3.9	75	3.6	76	3.2	44	1.7
	7.01 - 8.00	25	1.4	14	0.8	19	0,9	21	0.9	26	1.0
	8.01 - 10.00	18	1.0	18	1.0	24	1,2	17	0.7	26	1.0
	>10.01	24	1.3	20	1.1	25	1,2	22	0.9	38	1.4
	Total	1793	100	1883	100	2059	100	2409	100	2 628	100

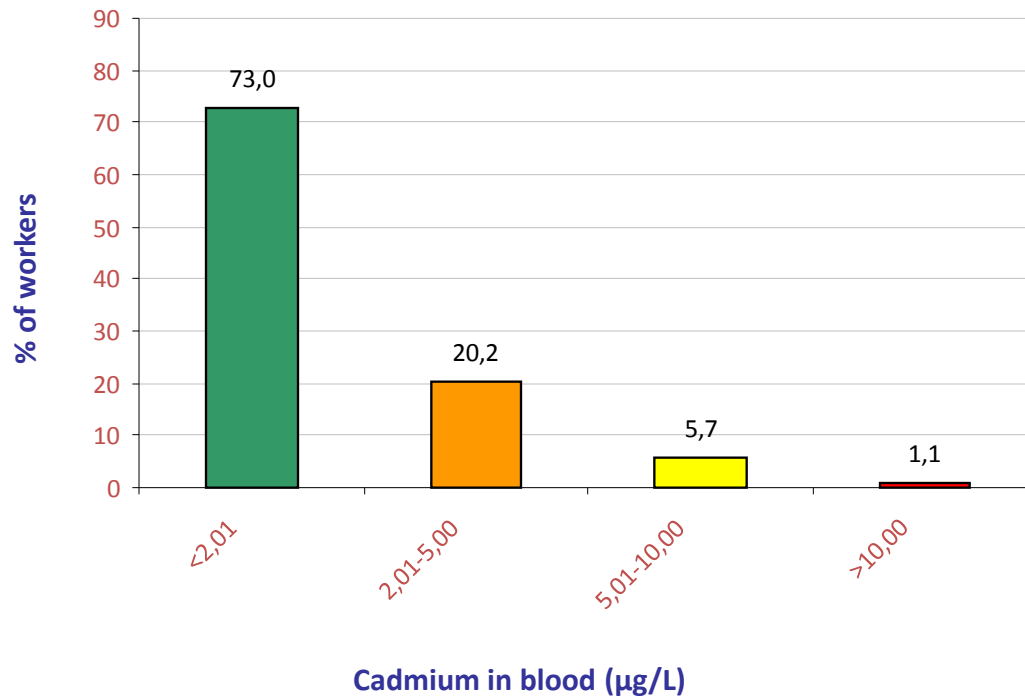
Distribution of blood cadmium in EU-sites 2008

	Cd in blood (µg/L)	2008	
		N	%
	0.00 - 2.00	1332	74.3
	2.01 - 3.00	177	9.9
	3.01 - 5.00	162	9.0
	5.01 - 7.00	55	3.1
	7.01 - 8.00	25	1.4
	8.01 - 10.00	18	1.0
	>10.01	24	1.3
	Total	1793	100



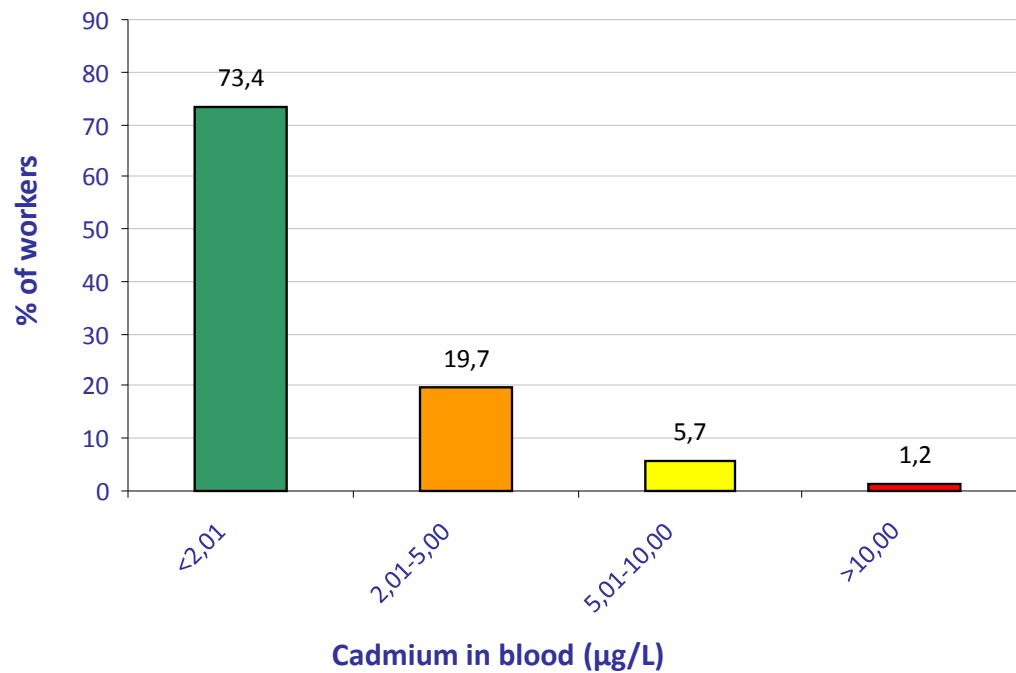
Distribution of blood cadmium in EU-sites 2009

	Cd in blood (µg/L)	2009	
		N	%
	0.00 - 2.00	1332	73.0
	2.01 - 3.00	195	10.7
	3.01 - 5.00	174	9.5
	5.01 - 7.00	72	3.9
	7.01 - 8.00	14	0.8
	8.01 - 10.00	18	1.0
	>10.01	20	1.1
	Total	1883	100



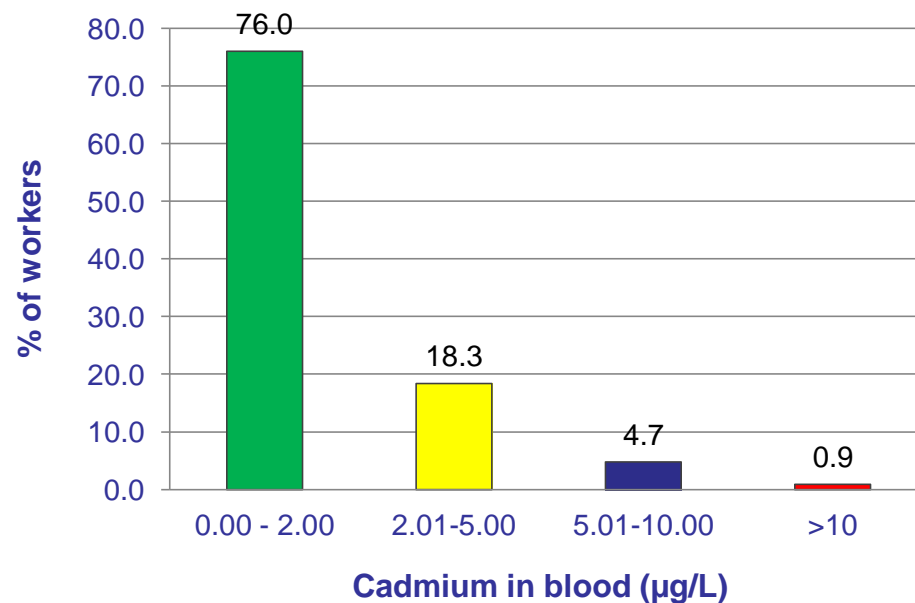
Distribution of blood cadmium in EU-sites 2010

	Cd in blood (µg/L)	2010	
		N	%
	0.00 - 2.00	1511	73.4
	2.01 - 3.00	232	11,3
	3.01- 5.00	173	8,4
	5.01 - 7.00	75	3.6
	7.01 - 8.00	19	0,9
	8.01 - 10.00	24	1,2
	>10.01	25	1,2
	Total	2059	100



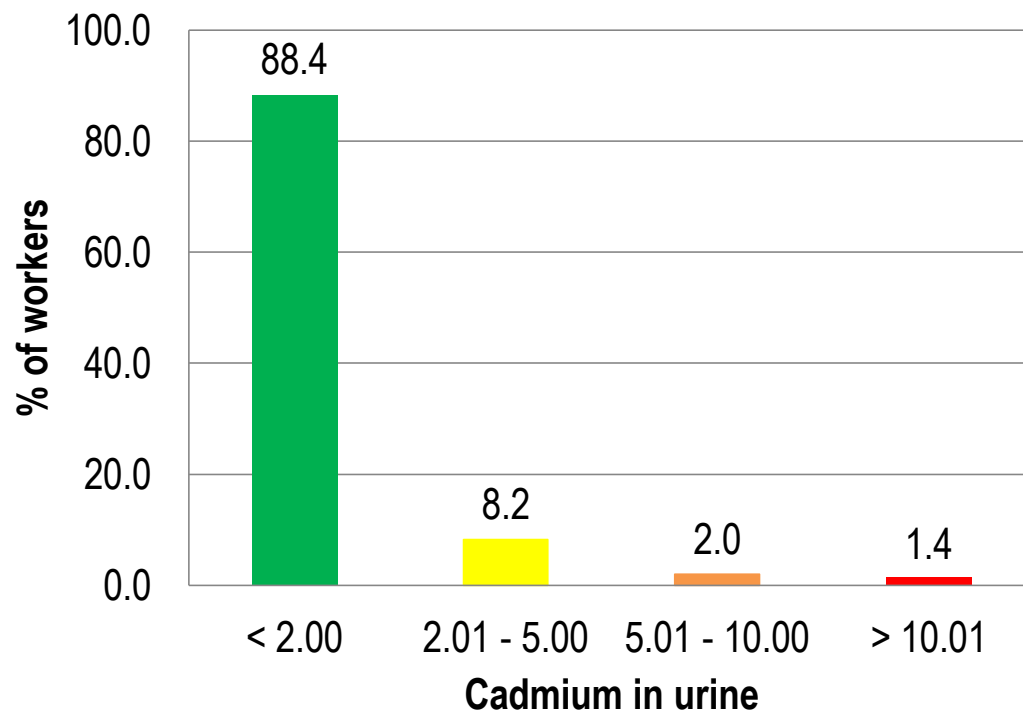
Distribution of blood cadmium in EU-sites in 2011

	Cd in blood (µg/L)	2011	
		N	%
	0.00 - 2.00	1831	76.0
	2.01 - 3.00	259	10.8
	3.01 - 5.00	183	7.6
	5.01 - 7.00	76	3.2
	7.01 - 8.00	21	0.9
	8.01 - 10.00	17	0.7
	>10.01	22	0.9
	Total	2409	100



Distribution of blood cadmium values in EU-sites 2012

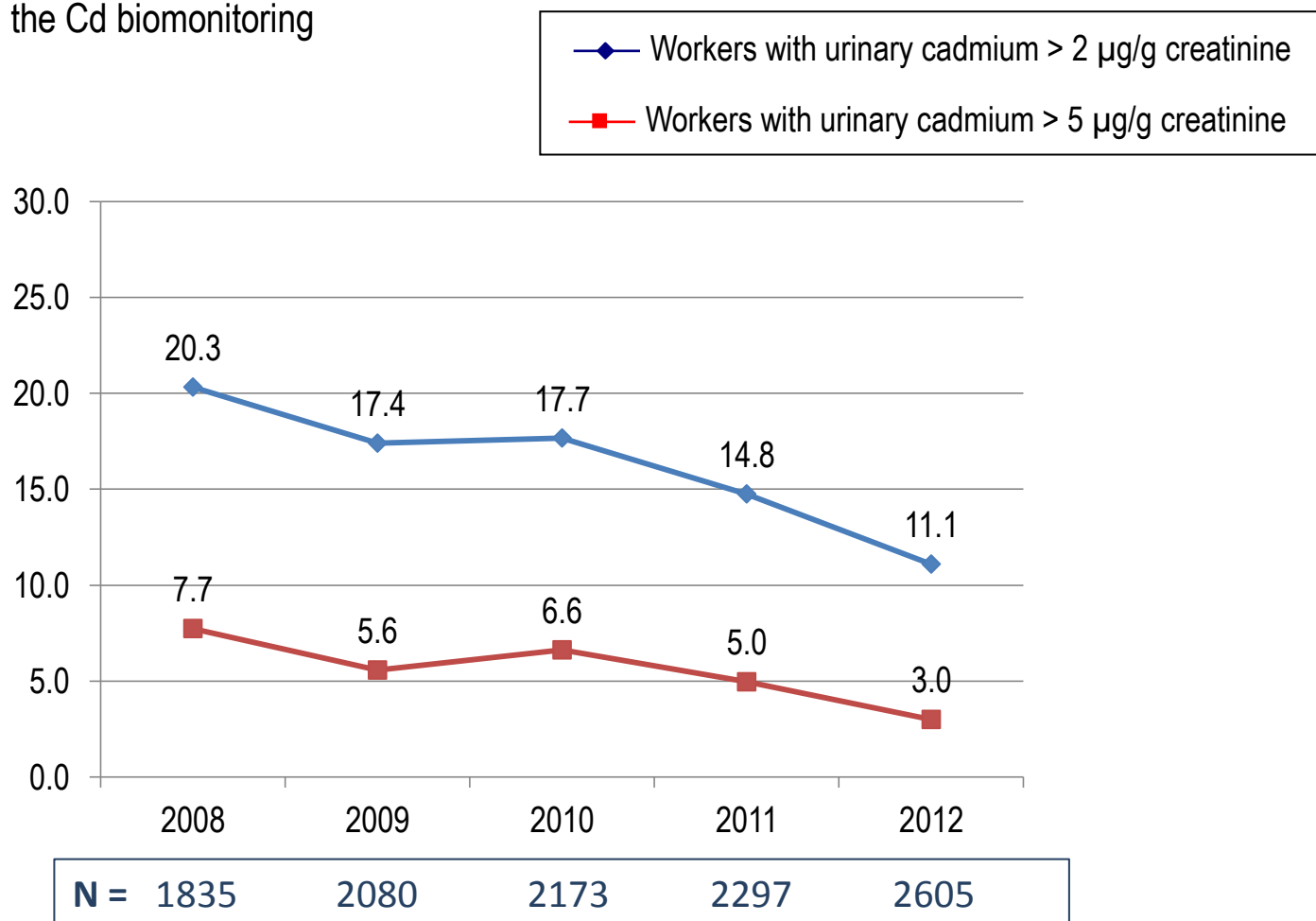
	Cd in urine (µg/L)	2012	
		N	%
Green	0.00 - 1.00	2097	79.8
	1.01 - 2.00	225	8.6
Yellow	2.01 - 3.00	172	6.5
	3.01 - 5.00	44	1.7
Orange	5.01 - 7.00	26	1.0
	7.01 - 10.00	26	1.0
Red	>10	38	1.4
	Total	2 628	100



TIME TREND - 15 SITES

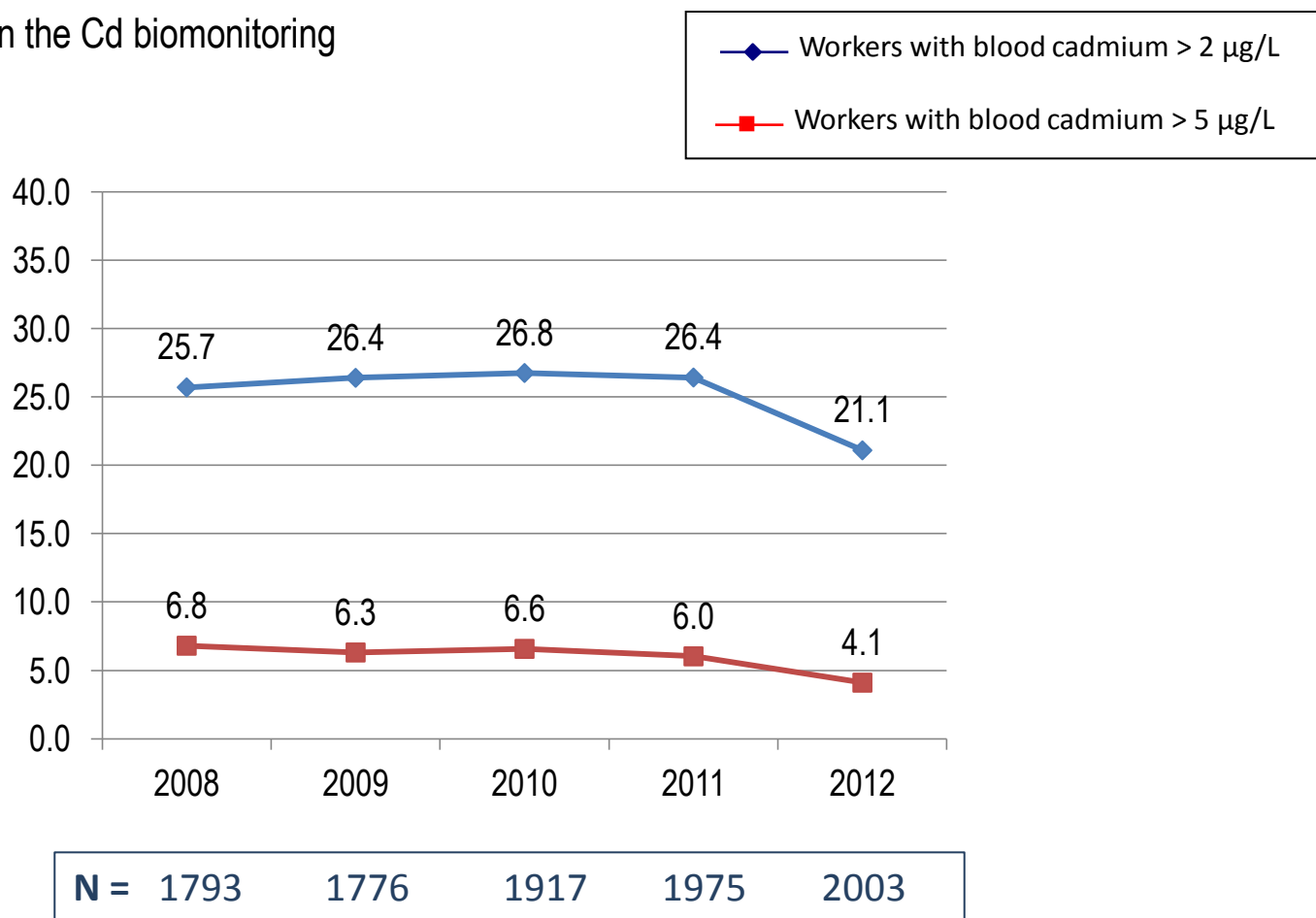
Percentage of workers exceeding an urinary cadmium levels of 2 or 5 $\mu\text{g/g}$ creatinine

15 EU-sites included in the Cd biomonitoring



Percentage of workers exceeding a blood cadmium levels of 2 or 5 µg/L

15 EU-sites included in the Cd biomonitoring

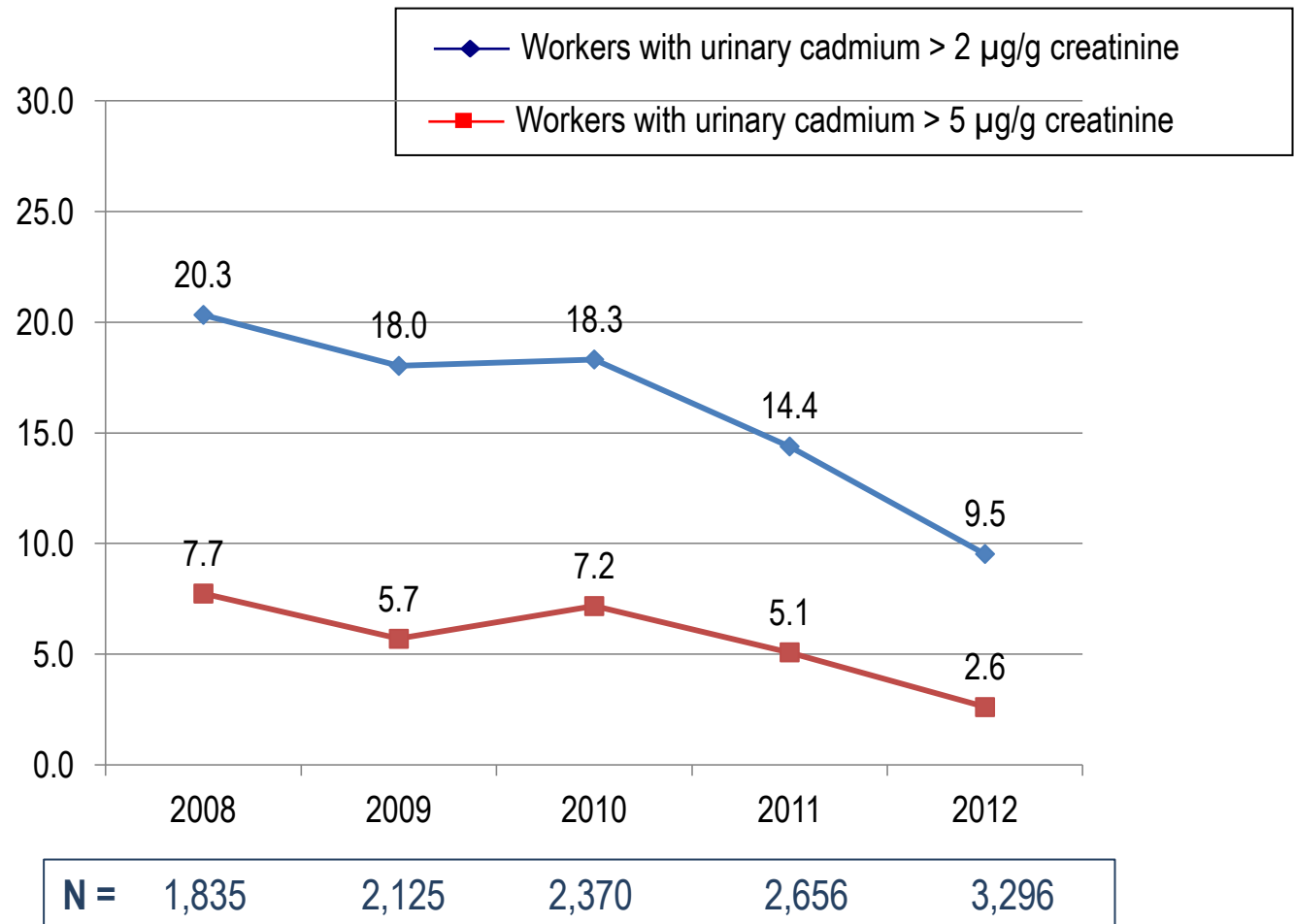


TIME TREND - ALL SITES

Percentage of workers exceeding an urinary cadmium levels of 2 or 5 µg/g creatinine

Various numbers of EU-sites included in the Cd biomonitoring

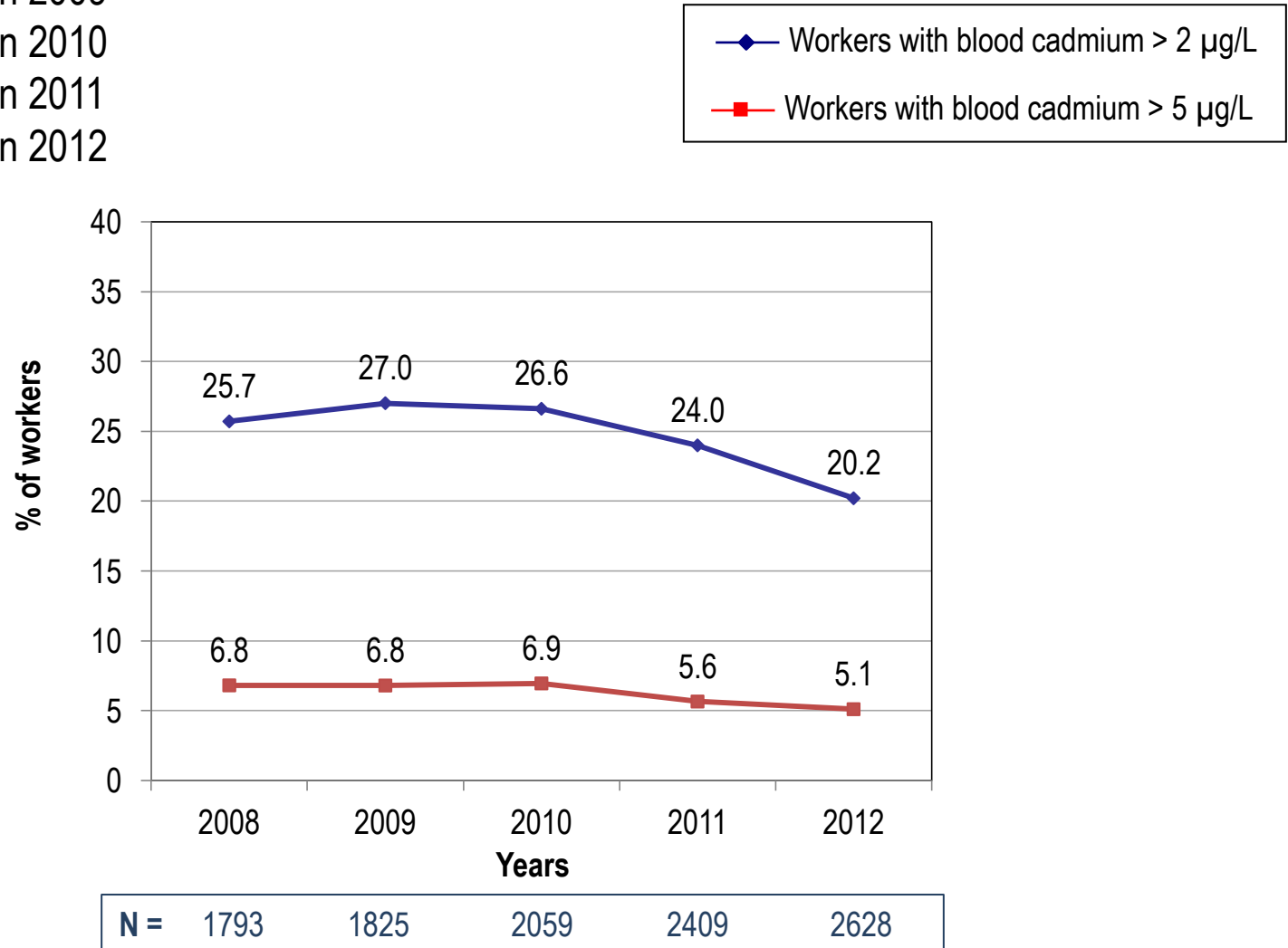
- 15 EU-sites in 2008
- 17 EU-sites in 2009
- 21 EU-sites in 2010
- 21 EU-sites in 2011
- 25 EU-sites in 2012



Percentage of workers exceeding an blood cadmium levels of 2 or 5 µg/g creatinine

Various numbers of EU-sites included in the Cd biomonitoring:

- 15 EU-sites in 2008
- 16 EU-sites in 2009
- 18 EU-sites in 2010
- 17 EU-sites in 2011
- 20 EU-sites in 2012



ICdA 2017/2020 (?)initiative

ICdA- 2017/2020(?) initiative (1)

- ❑ **Aim:** Not an individual but **a collective commitment** to achieve challenging targets in terms of biomonitoring results of the workers potentially exposed to Cd
- ❑ **How ?**

Revision and further implementation of ICdA guidance with the goal of further reducing occupational exposure of their employees
- ❑ **Goal:**
 - **93-95% of European employees** subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, below the urinary cadmium level of: **2 µg Cd/g creatinine by the end of XXXX,**
 - **9X% of European employees** subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, below the urinary cadmium level of: **2 µg Cd/g creatinine by the end of XXXX,**

ICdA – 2017/2020(?) initiative (2)

□ Based on a triple commitment:

1. Implementation of revised ICdA guidance 2013
2. Regular exchange of best practice between ICdA members
3. ICdA members report yearly results of exposure biomarkers monitoring to ICdA-trustee (OCdBio program)

Setting of the goal of ICdA initiative (1)

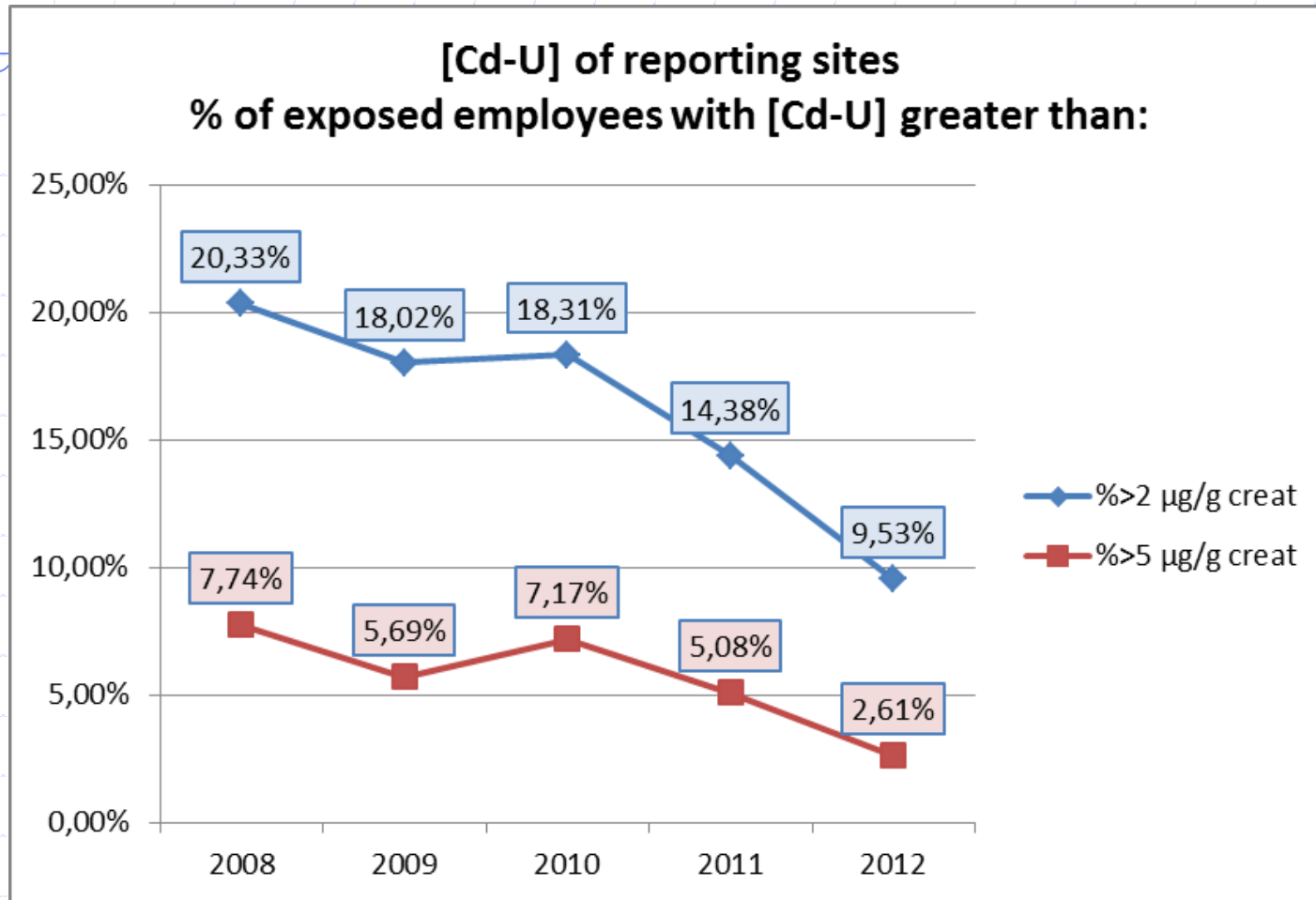
1st objective:

95% of European employees subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, below the urinary cadmium level of: **2 µg Cd/g creatinine by the end of XXXX**

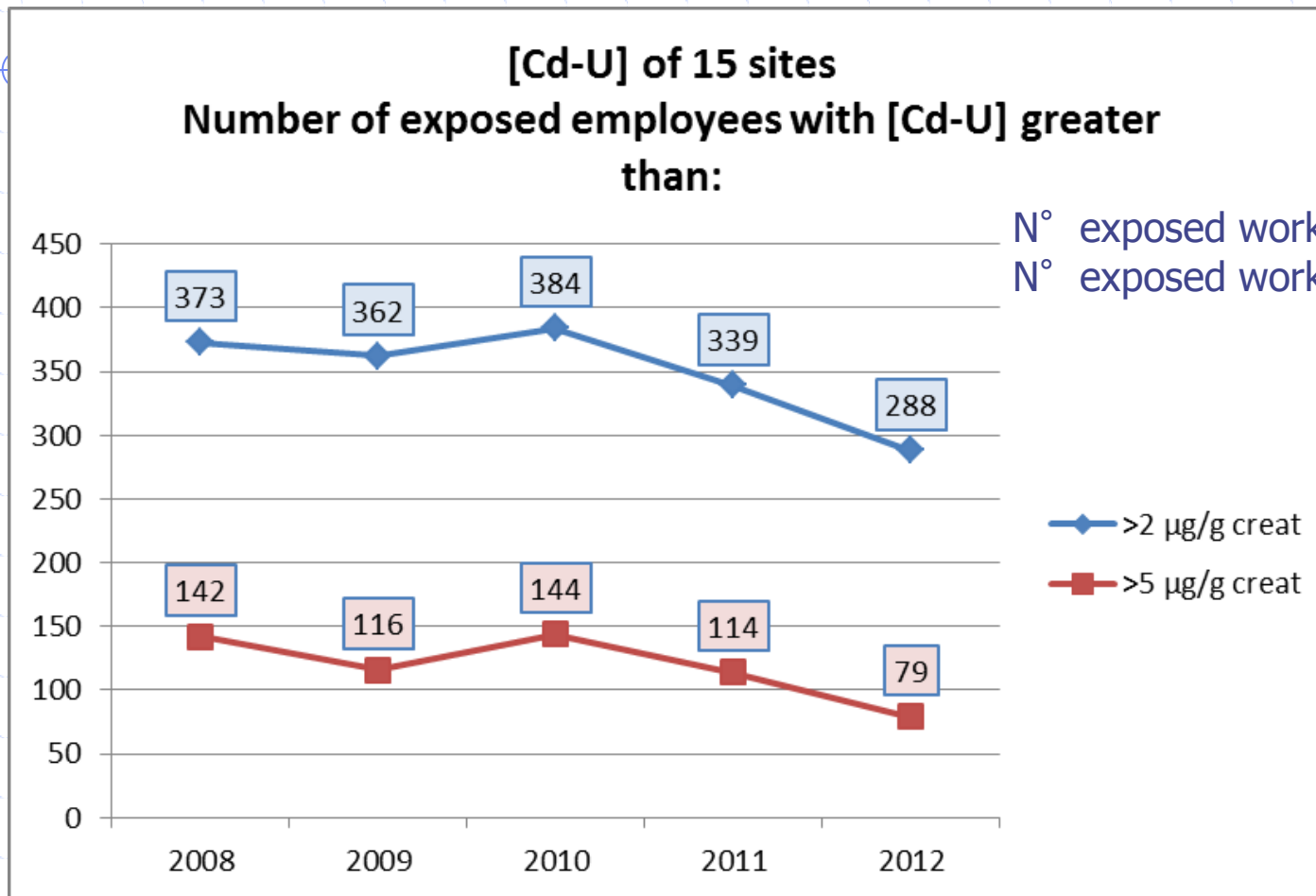
- OCdBio data of all reporting sites shows that:
 - in 2012 already 90.5% has CdU < 2 µg Cd/g creatinin
 - From 2011-2012: 85.6%-90.5%: gain of 5% in 1 year only!
- OCdBio data of 15 reporting sites shows that:
 - From 2011-2012: CdU > 2 µg Cd/g creatinin: 339-288 → 51 persons less in this category
 - 51 on a total of 2297 persons gives a gain of 2.2% in 1 year

Conclusion: proposal for 93-95% by the end of 2015/2016

OCdBio data set (2008-2012)



OCdBio data set (2008-2012)



N° exposed workers in 2011= 2297

N° exposed workers in 2012= 2605

In 2011:

5% : CdU > 5µgCd/g creatinin

14.7% : CdU > 2µgCd/g creatinin

3.7%



In 2012:

3% : CdU > 5µgCd/g creatinin

11% : CdU > 2µgCd/g creatinin

Setting of the goal of ICdA initiative (2)

2nd objective:

- **9X% of European employees** subject to medical surveillance and bio-monitoring as required by their occupational medical doctor, below the urinary cadmium level of: **2 µg Cd/g creatinine by the end of XXXX**

→ 97-98% by the end of 2020?

Conclusion:

- proposal for 97 or 98% by the end of 2020
- Or: fix date after having reached 1st objective

2013-revised ICdA guidance on risk-managment of Cd

2013-revised ICdA guidance on risk-management of Cd

- ❑ Purpose: to supply guidance to occupational medical doctors and management of plants with the purpose of bringing Cd exposure of all employees as $CdU < 2\mu g \text{ Cd/g creatinin}$
- ❑ Industry guidance rest on 3 pillars to be implemented concurrently
 1. Ensuring plant cleanliness
 2. Collective and individual hygiene procedures
 3. Medical surveillance

Comments?

Workplace air monitoring: practice

Workplace air monitoring: practice

In order to show compliance with the DNEL(respirable) of **4µg/m³** and efficiency of our management system, we will have to be able to show results and improvements

- ❑ We are on good track with our database 'OCdBio' that we need to further refine according to best practice
- ❑ We need to start systematic measurements-campaign of Cd-air >> « **Respirable fraction** » vs total/inhalable fraction
- ❑ A first data-collection is expected by **end of Q3-2013**

Other business

Other business (1)

- Follow-up former H&S-com. on Water Framework Directive (WFD)
 - Goal: zero emissions of priority hazardous substances (e.g.: Cd) by 2020
 - ⇒ development of « no emission processes »
 - ✓ Evaporation solutions
 - ✓ Closed circuits
 - ✓ ...
 - EQS (water quality standard): $0.19\mu\text{g/l}$ + hardness correction
 - ✓ = very low, problems in member states to comply
 - ✓ Mandate of Commission to WCA cons. (UK) to check on bioavailability correction to relax Cd EQS

Other business (2)

- ❑ Hardness correction: $0,19\mu\text{g/l} \Rightarrow 0,08-0,25\mu\text{g/l}$
- ❑ Development of « BLM » for Cd, cf. Zinc, Cu, ...?
 - Literature study (WCA-Univ Gent): 12500-18000€ will be proposed to the ICdA-Board for budget 2014
 - \Rightarrow focused experimental study? (...?€)
 - ✓ Focusing on sensitive species and conditions
 - Discussion on assessment factor 2?
- ❑ EQS has direct relationship to description of « safe use » under REACH

Conclusions / Next meetings