

MANGANESE REPROTOXICITY: YOUR NEWS TO TELL

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Cape Town

1. Introduction:

- How it all started - Regulatory websites
- Consequences on specific audiences
- Published literature on Mn reprotoxicity
- Frequency of publications & what it could mean

2. Reproductive toxicity

- Why perform a study?
- Study Methodology – First & second generation
- Results & conclusions

3. The only way forward

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Introduction- How it all started...



The EU Scientific Committee on Occupational Exposure Limits (SCOEL) commented that there was little evidence for reproductive or developmental toxicity of inhaled manganese



The US Agency for Toxic Substances and Disease Registry (ATSDR) reported that impaired sexual function in men may be one of the earliest clinical manifestations of Mn toxicity...

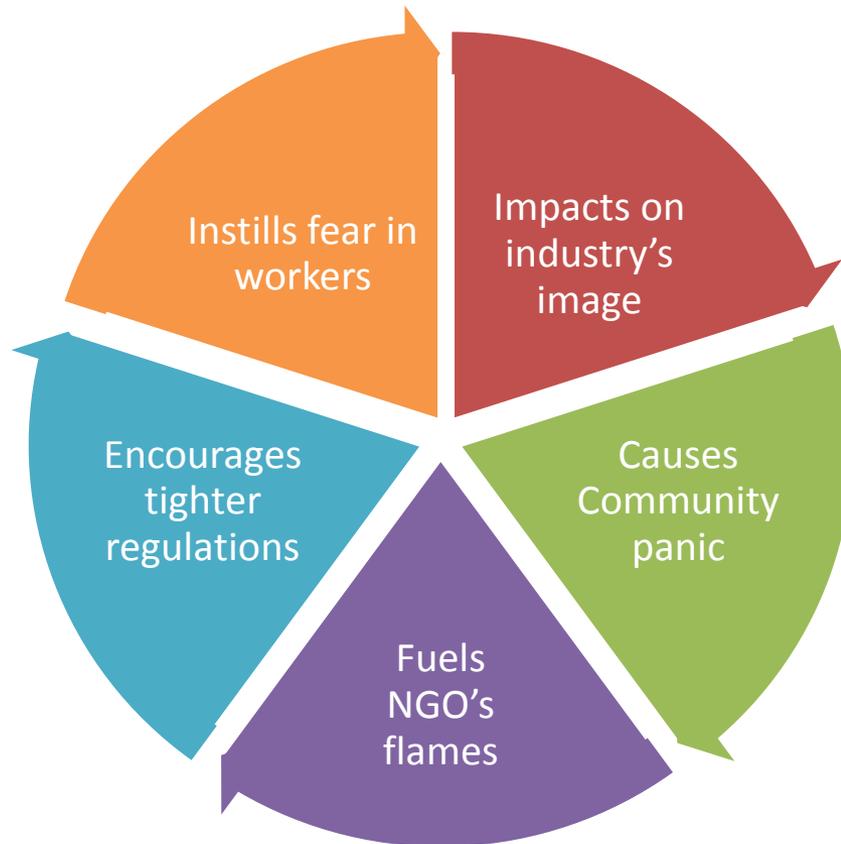


Health Canada's website states that a number of studies have shown that exposure to Mn can cause deleterious effects on the male reproductive system...



The Belgian authorities quote a recent epidemiological fertility study of Belgian workers exposed to manganese concluding that the number of children born to exposed male workers (aged 16-35) was half that in a control group

Introduction- Consequences on specific audiences



Introduction-

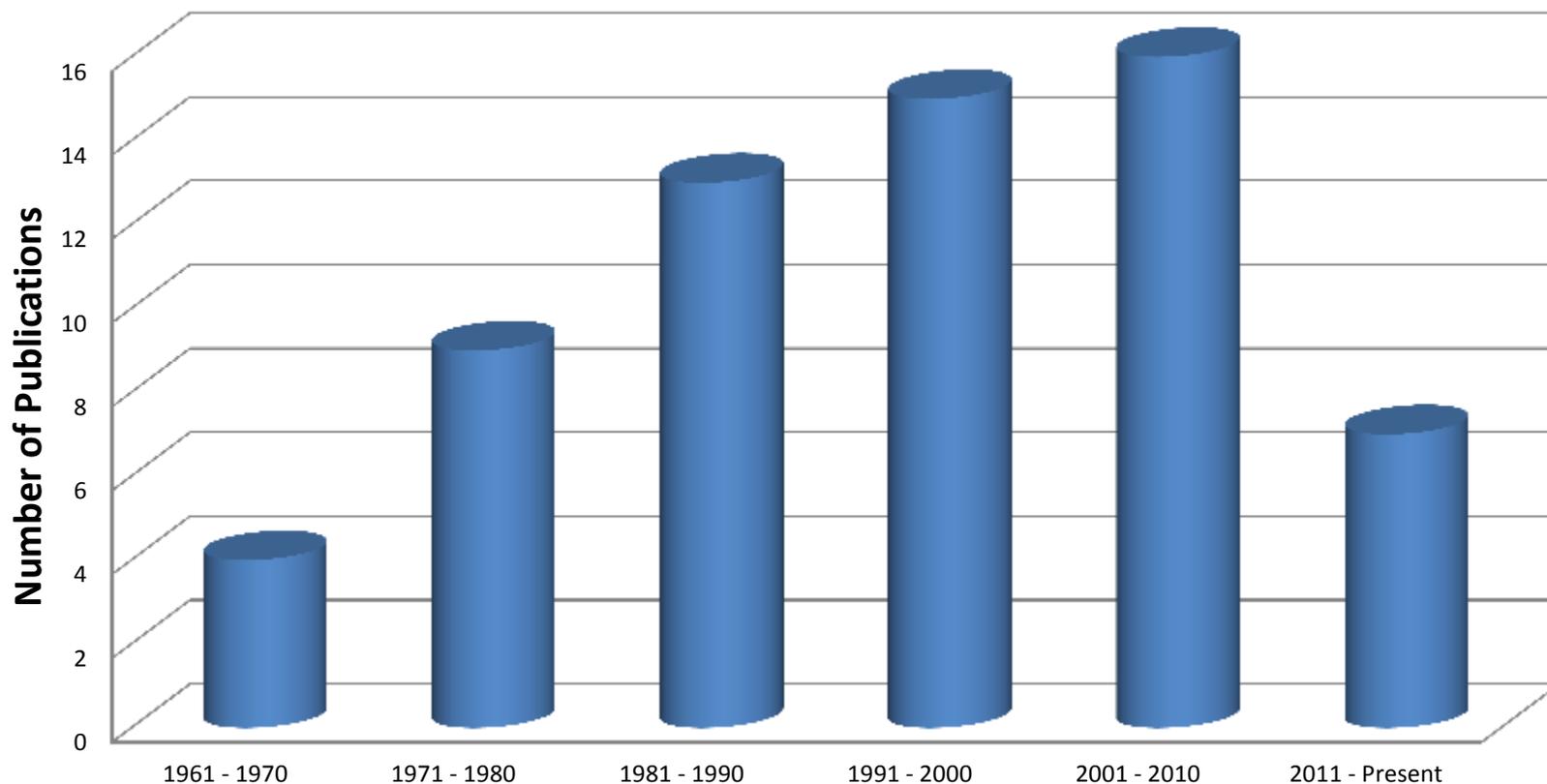
Published literature on Mn Reprotoxicity

- A thorough search dating back 55 years on manganese & its inorganic compounds with search terms related to reprotoxicity was carried out
- The search reviewed 64 different peer-reviewed articles and rejected 33 (considered 31)
- The reproductive aspects evaluated were as follows;
 - ✓ Fertility & effects on reproductive organs
 - ✓ Pregnancy & prenatal development
 - ✓ Noenatal & juvenile offspring development
- **The conclusion = inconclusive**



Introduction- Frequency of publications: 1960 - Present

Mn Reprotoxicity published literature



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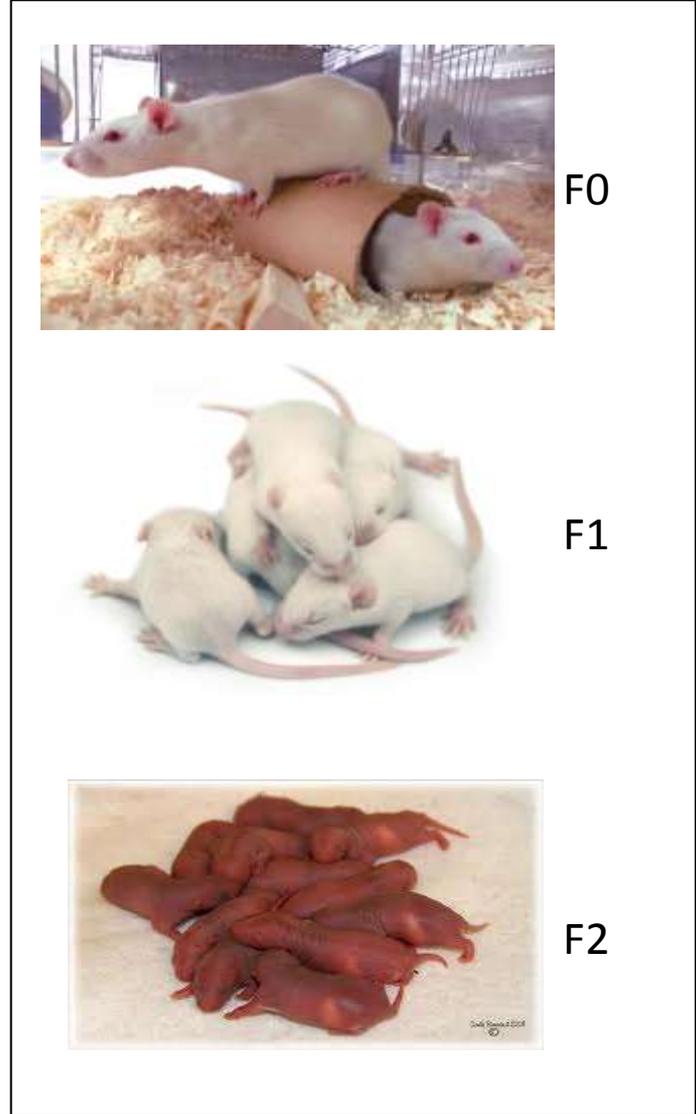
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Reproductive toxicity – Why perform a study?

- One of the OHES committees objectives is to “Identify those OHES topics that can impact on the Mn industry and provide answers”
- A long term inhalation study with no confounders, conducted under internationally recognised guidelines did not exist
- An overview of available literature resulted was inconclusive
- In the absence of a good study regulators could impose unnecessary risk management measures

Reproductive toxicity – Study Methodology

	Group 1	Group 2	Group 3	Group 4
Animals	F0 28M+28F F1 26M+26F	F0 28M+28F F1 24+24F	F0 28M+28F F1 24M+24F	F0 28M+28F F1 25M+25F
Target dose (µg/L)	0 (air)	5	10	20
Dose period	F0 – Approximately 17 weeks F1 – Approximately 17 weeks			
Daily dose duration*	6 hours			
Frequency	Daily			



Reproductive toxicity – Results & conclusions

- ✓ No changes in reproductive organ weights & histology,
- ✓ No effects on sperm quality & quantity,
- ✓ No effects on oestrous cycles, fertility or duration of gestation
- ✓ No decrease in libido for both males & females
- ✓ # of implantation sites, birth weights, litter sizes were normal...

**Manganese is
NOT a REPROTOXICANT**



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Communication:

- Presented at conference: International symposium on biological monitoring (ISBM) 9-11th Sept 2013; Manchester, UK
- Poster presented at the Society of Toxicology: 23-27th March 2014; Phoenix, USA
- IMnI Factsheet – 2 page document on www.manganese.org
- Next steps: publish in peer – review journals...

My Advice:

- Know the substance you handle!
- Take part in any new developments involving your substance/industry
- Work together towards building on your industry's image?
- Develop a communication strategy to appropriately tell your story...

Thank you

Have a question?

Contact: Dr Doreen McGough at ohes@manganese.org