

# Rationale for stopping the use of lead in paint

## Global Policymakers Webinar on Eliminating Lead in Paint through Regulatory Action

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Global Alliance to  
Eliminate Lead Paint

# Outline

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- Background
- Health effects of exposure
- Lead in paint as a source of lead exposure
- Economic arguments for preventing lead exposure
- Justification for setting a 90 ppm limit

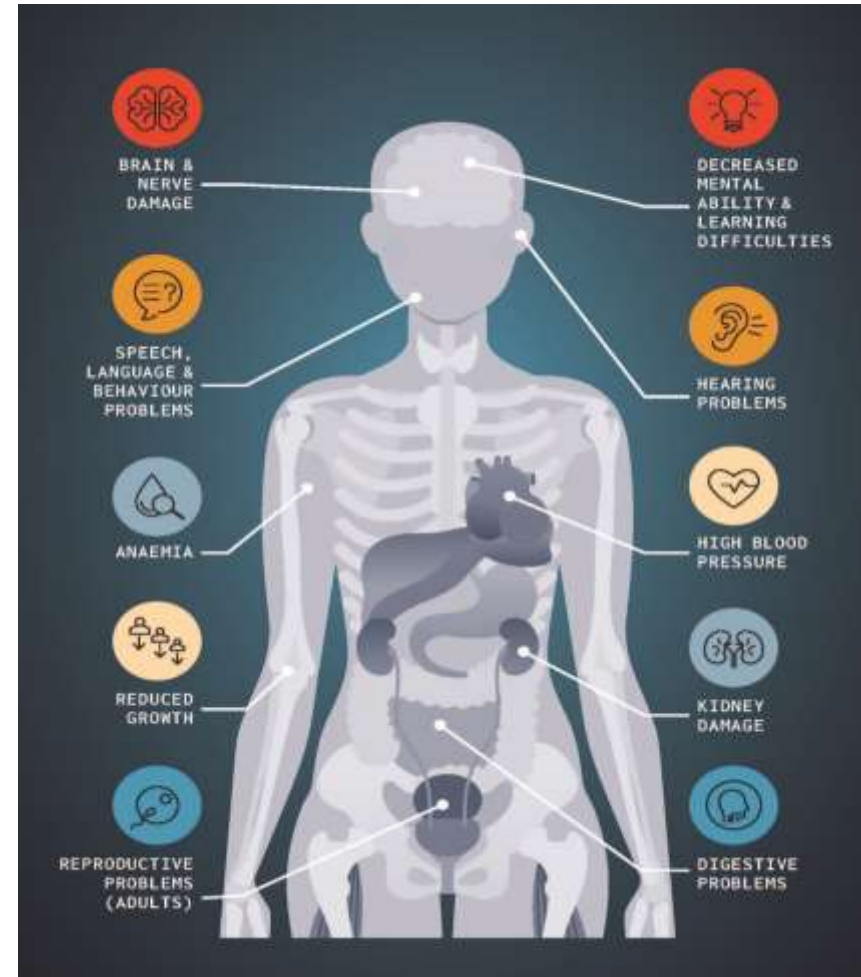
# Background

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- Lead is a versatile and widely used toxic substance.
- It is added to paint to obtain specific characteristics, e.g. colour, rapid drying, corrosion resistance.
- Lead paint is a source of human exposure to lead.
- Exposure can be prevented by using non-lead paint additives.
- This presentation will explain why it is important to stop the use of lead in paint.

# Lead is a multi-system toxicant

- No known level of exposure without harmful effects
- Mimics calcium and iron in the body so has effects in multiple body systems
- Accumulates in bone
- Long-term effects include reduced IQ, antisocial behaviour, cardiovascular & renal disease



# Children are especially vulnerable

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- Greater exposure:
  - spend more time on the ground and in contact with contaminated soil and dust
  - hand-to-mouth activity, mouthing
  - absorb 4–5 times more lead from the gut than adults
- Early childhood is critical period for neurological and organ development
- Damage may be irreversible
  - reduced potential for intellectual development
  - increased likelihood of behavioural disorders



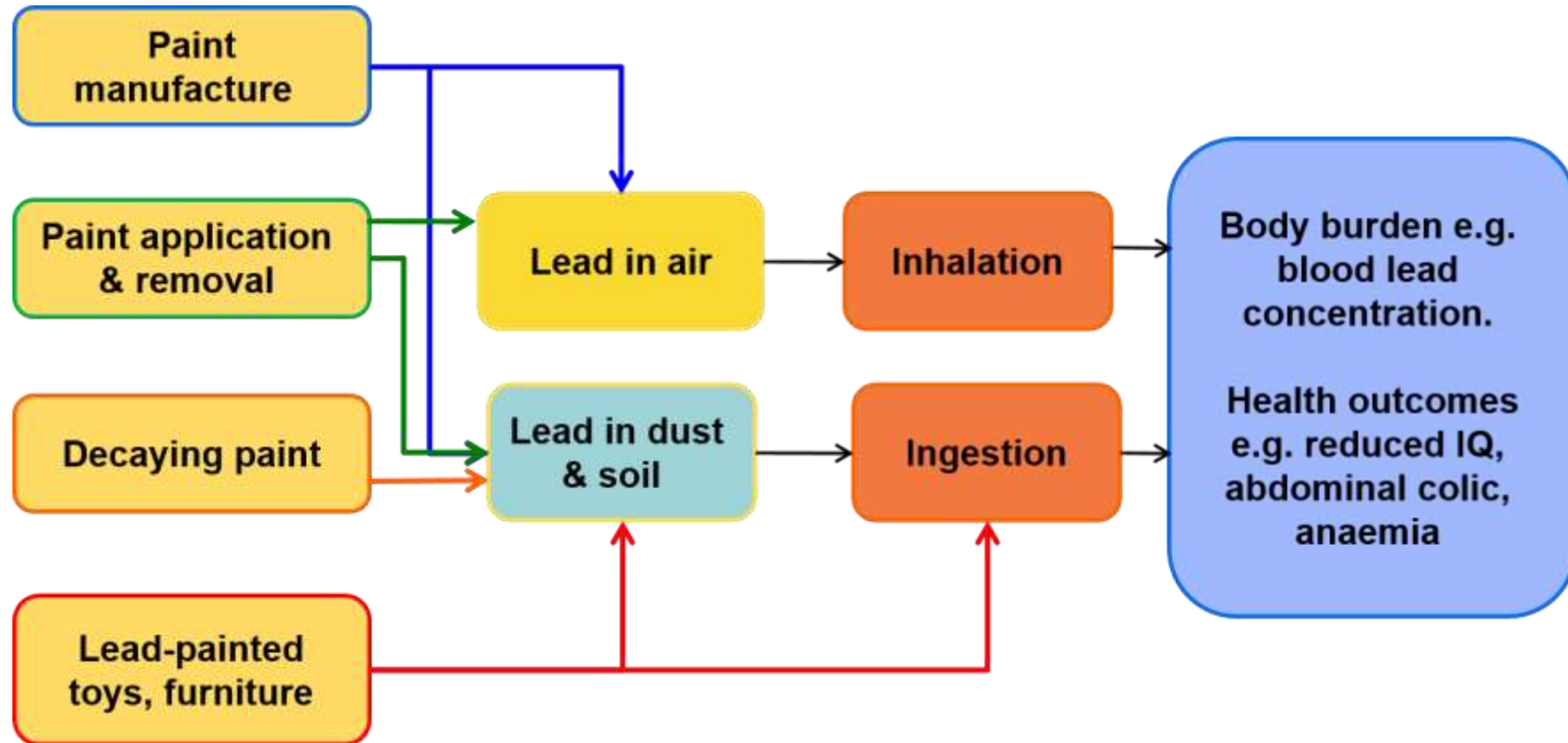
Figure 2 – A large quantity of lead paint chips can be seen in this radiograph of the abdomen and pelvis of a 2-year-old boy with lead poisoning.

# Pregnant women are vulnerable

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- Pregnancy mobilizes lead stored in bone, releasing it back into blood where it can be circulated to maternal tissues and the fetus
- Lead exposure may cause reduced fetal growth
- Lead exposure in pregnancy increases risk of complications e.g. hypertension, premature birth

# Multiple pathways of exposure to lead from paint



# Studies show that lead in paint is a source of lead in dust

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- Isotopic studies confirm that lead in paint contributes to lead in dust
- Deteriorating lead paint associated with higher amounts of lead in household dust and soil
- Lead content in paint correlates with lead content in dust:
  - 50% increase in window paint lead was associated with a 5% increase in floor dust lead (Dixon 2007)
  - exterior railings with a lead loading of  $\geq 2.6$  mg/cm<sup>2</sup> associated with approx 50% higher lead loading in household dust (Lucas 2014)





# Lead in dust associated with increased blood lead

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- Pooled analysis of 12 studies showed lead-contaminated house dust is major source of intake for children with BLL of 10-25  $\mu\text{g}/\text{dL}$  (Lanphear et al., 1998)



# The lower the lead content the lower the hazard

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- Children who eat flakes of lead paint can develop lead poisoning
- The lower the lead content the less likely a child will eat enough paint to cause harm
  - 500 ppm of lead in paint – regular ingestion of 6-7 flakes of paint could reduce IQ
  - 90 ppm of lead in paint – harmful dose is ~31 flakes
- Similar reasoning applies to lead in dust originating from paint



# Workers also need protecting

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- Study in Kenya found significant lead exposure in workers making paint
  - 78% of air samples exceeded US 8-hour permissible exposure limit ( $50 \mu\text{g}/\text{m}^3$ )
  - 75.6% of blood samples  $>30 \mu\text{g}/\text{dL}$  lead
- Workers spraying and stripping lead paint can have high exposures



# Lead exposure causes significant burden of disease

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*Estimates from Institute for Health Metrics and Evaluation (IHME), 2017 data*

- 1.06 million deaths from long-term effects
- 24.4 million disability adjusted life years (DALYs) lost
- 63.2% of the global burden of idiopathic developmental intellectual disability
- 10.3% of hypertensive disease

<https://vizhub.healthdata.org/gbd-compare/>

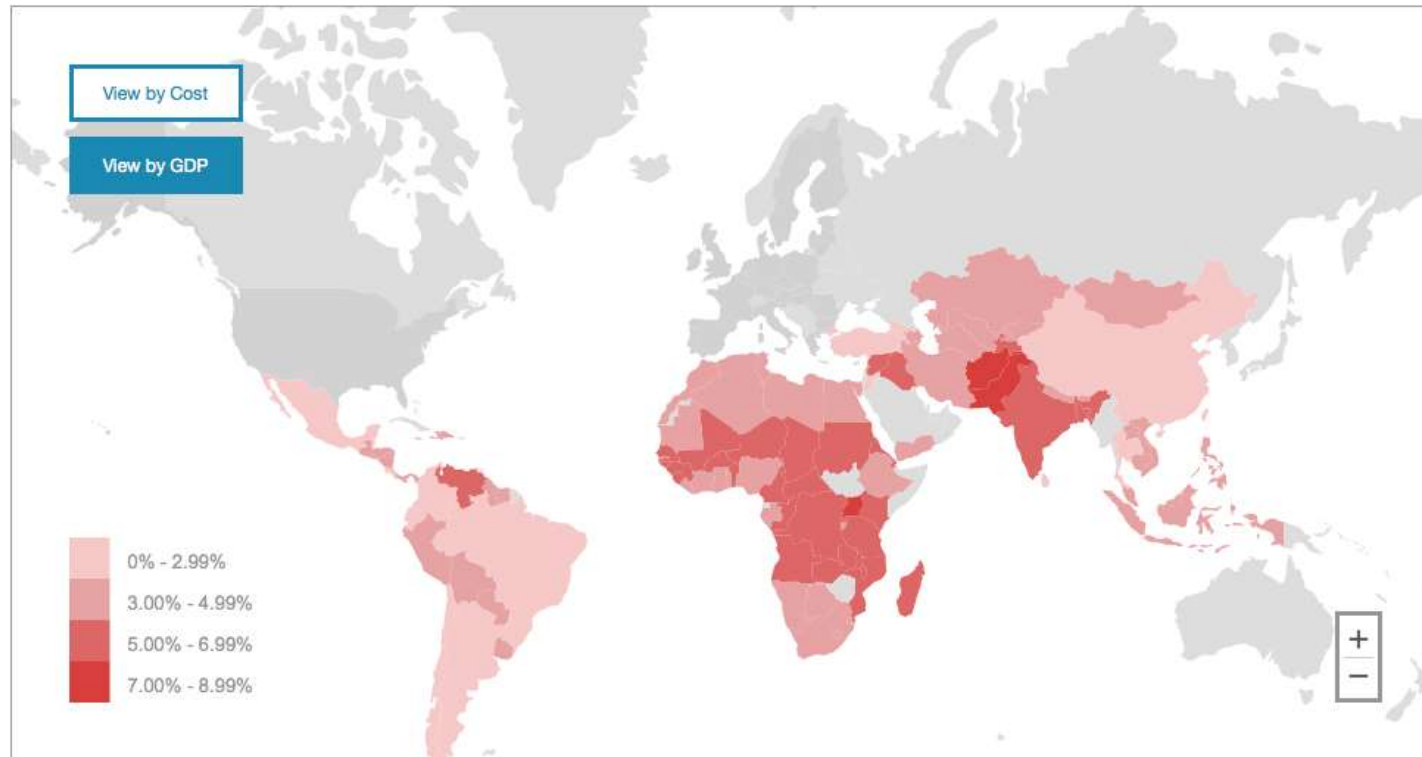
# Economic costs of lead exposure are high

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- Estimated economic losses due to reduced IQ is ~1.2% of global GDP
- Largest economic burden is borne by low- and middle- income countries – approx. \$977 billion
- Regional economic losses:
  - in Africa approx. \$134.7 billion (4.03% of regional GDP)
  - in Latin America and the Caribbean approx. \$142.3 billion (2.04% of regional GDP)
  - in Asia approx. \$699.9 billion (1.88% of regional GDP).

# More information on economic costs of childhood lead exposure in low- and middle-income countries

An interactive map based on the findings of a New York University (NYU) analysis displays cost and corresponding percent loss to GDP in 110 low- and middle-income countries.



<http://www.med.nyu.edu/pediatrics/research/environmentalpediatrics/leadexposure>

# Economic benefits of action are significant

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- Banning lead paint now saves future costs
- Avoids future costs of lead exposure resulting from use of lead paint now, e.g. cost of reduced IQ, cost of criminality
- Avoids future costs of hazard controls for legacy paint e.g. remediation
  - estimated costs of remediating lead-painted homes:
    - France: US\$ 194 – 499 million
    - USA: US\$ 1 – 11 billion

*Pichery C et al. Childhood lead exposure in France: benefit estimation and partial cost-benefit analysis of lead hazard control. Environmental Health. 2011;10:44*

*Gould E. Childhood Lead Poisoning: Conservative Estimates of the Social and Economic Benefits of Lead Hazard Control. Environ Health Perspect, 2009;117: 1162-1167*

# Regulating lead paint reduces lead exposure

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- In Canada, France & USA homes built before lead paint regulation have higher concentration of lead in dust than homes built after regulation
- In France and USA children living in older homes where there is lead paint have higher blood lead concentrations than children living in homes built after lead paint regulation
  - e.g. when lead limit was 10,000 ppm children in homes with lead paint 16x more likely to have BLL >30  $\mu\text{g}/\text{dL}$  than children in homes with no lead paint



# Why 90 ppm limit on lead content?

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- Lead is harmful at all levels of exposure, so there is no safe level of lead exposure
- There is no therapy that can reverse the effects of lead on brain development and the cardiovascular system
- It is essential to limit exposure to lead as much as possible
- Technically feasible for all paints as confirmed by paint manufacturers in many countries
- 90 ppm is the lowest maximum level currently required by any country

# A 90 ppm limit on lead content is technically feasible

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- Non-lead-based pigments, dryers and anti-corrosives are widely available for oil-based paints, and are used by many manufacturers to produce high quality paints
- Paint made with compounds that are not lead-based will have a lead content <90 ppm
- If care is taken to source uncontaminated raw materials ingredients the lead content can be much lower than 90 ppm

# A 90 ppm limit on lead content promotes trade

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- 90 ppm is becoming an accepted international standard around the world for lead levels in some paints
- Already used in a number of countries, e.g. Canada, China, Kenya, Nepal, the Philippines, the United Republic of Tanzania, and the United States of America

# Conclusions

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- Lead has wide-ranging effects on health – these have personal, societal and economic impacts
- Good data link lead in paint to human exposure and poisoning - therefore action by government and industry is needed
- Paints with the required properties can be made without adding lead
- As more countries regulate lead paint the market for such paints will continue to shrink
- Stopping the addition of lead to paint makes public health and business sense

# Additional information is available

## Technical brief – detailed information



## Policy brief – summary information

**Introduction**

Lead has toxic effects on almost all body systems and is especially harmful for children and pregnant women. Lead paint is an avoidable source of exposure to lead. "Lead paint" or "lead-based paint" is paint to which one or more lead compounds have been intentionally added by the manufacturer to obtain specific characteristics. One important way to prevent exposure is for countries to establish legally binding regulatory measures prohibiting the addition of lead to paint.

This policy brief summarizes key information explaining the background and rationale for eliminating lead paint, and describes what countries should do. More detailed information is available in the companion technical brief.<sup>1</sup>

**International efforts to eliminate lead paint have increased**

Governments are working together to promote policy action at the national and regional level to protect human health from exposure to lead.

- In 2009, the second session of the International Environment Programme (UNEP) and the World Health Organization (WHO). The primary goal of the Alliance is to promote the global phase-out of lead paint through the establishment of legally binding control measures in every country.
- In 2017, the World Health Assembly approved the Road map to enhance health sector engagement in

[https://chemicalswithoutconcern.org/library?keys=lead&field\\_publication\\_program\\_tid%5B%5D=32&field\\_publication\\_type\\_tid%5B%5D=184](https://chemicalswithoutconcern.org/library?keys=lead&field_publication_program_tid%5B%5D=32&field_publication_type_tid%5B%5D=184)

# Thank you!



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