NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH

Division of the National Herald Laboratory Service

UNIVERSITEIT VAN PRETORIA
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Silicosis in the construction industry

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31 July 2019

Healthy, Safe, Happy & Sustainable Workplaces

PROMOTING DECENT WORK THROUGH CUTTING EDGE RESEARCH, SPECIALISED SERVICES, INFORMATION, TEACHING AND TRAINING

Silica

Mineral found in the earth's crust

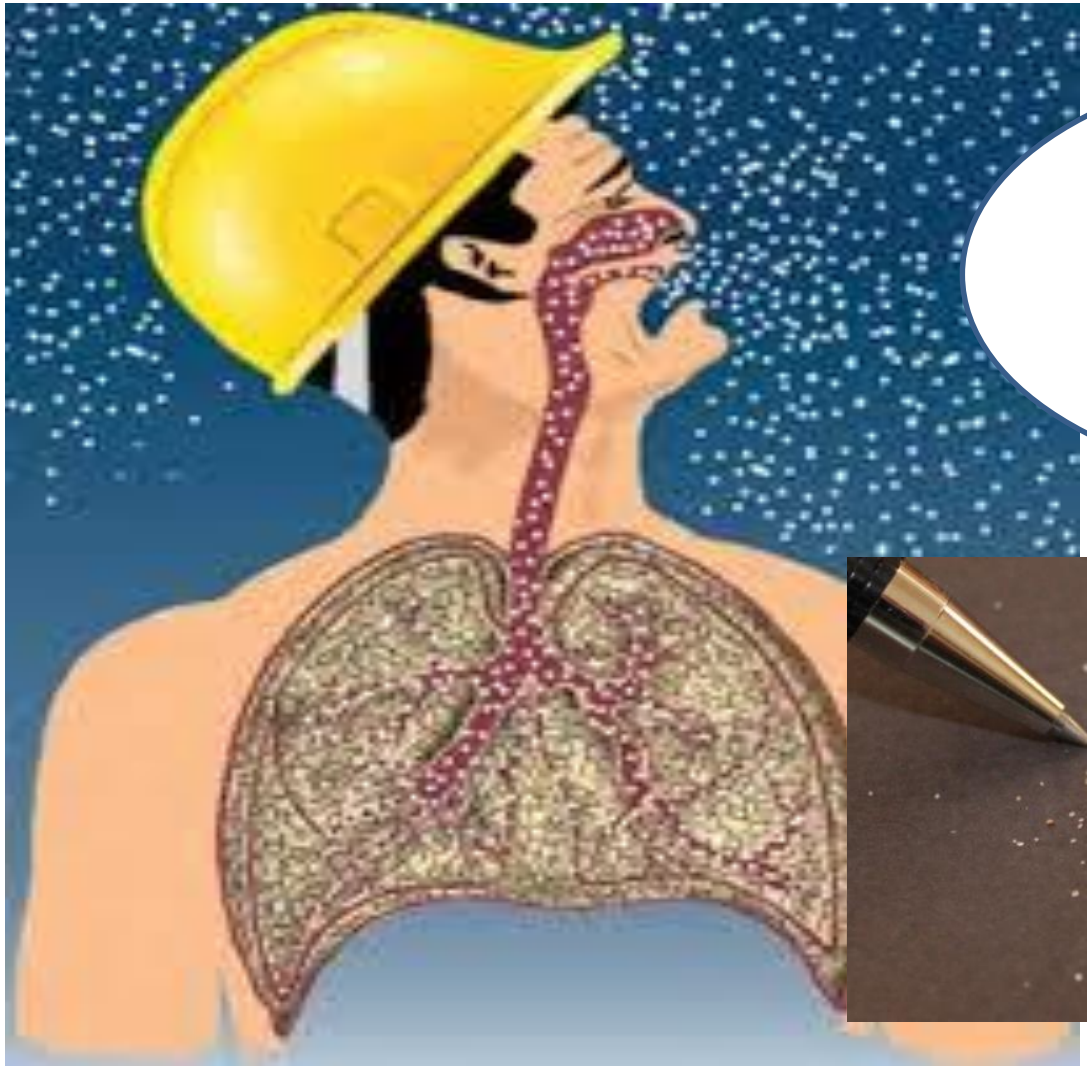
Two main groups Crystalline and Amorphous silica

"quartz" is the most toxic form of silica

One form of crystalline silica and the most common is "quartz"

Materials containing silica

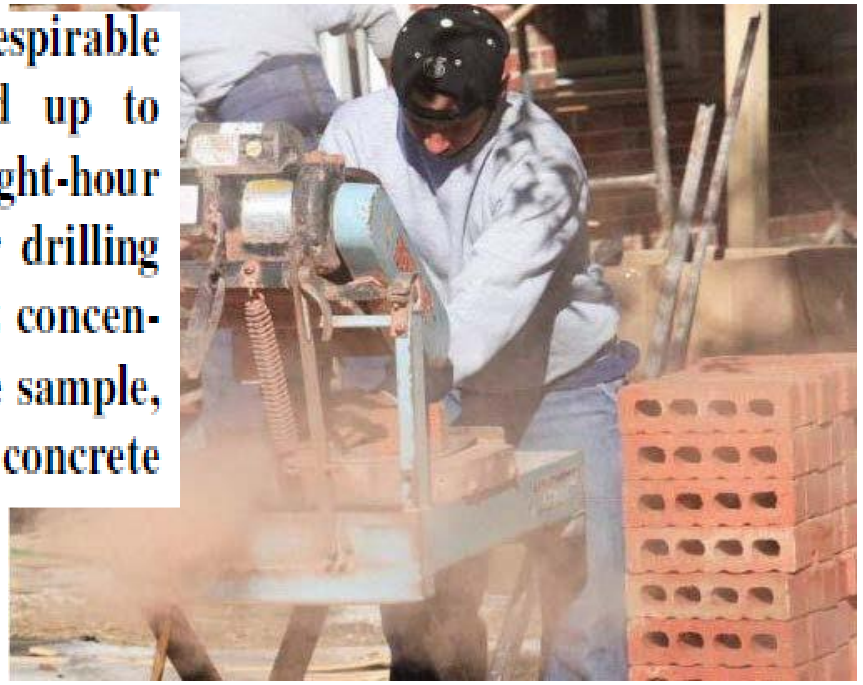
Important route of entry to the human body



Small particles, remain in the body for long periods! Unbreakable by the body

Exposure to Respirable Crystalline silica

For abrasive blasting of concrete structures, the respirable crystalline silica (quartz) concentration ranged up to 14.0 mg/m^3 for a 96-minute sample resulting in an eight-hour time-weighted average (TWA) of 2.8 mg/m^3. For drilling concrete highway pavement the respirable quartz concentrations ranged up to 4.4 mg/m^3 for a 358-minute sample, resulting in an eight-hour TWA of 3.3 mg/m^3. For concrete



wall grinding during new building construction the respirable quartz measurements ranged up to 0.66 mg/m^3 for a 191-minute sample, resulting in an eight-hour TWA of 0.26 mg/m^3. The air sampling results for concrete sawing ranged up to 14.0 mg/m^3 for a 350-minute sample resulting in an eight-hour TWA of 10.0 mg/m^3. During the milling

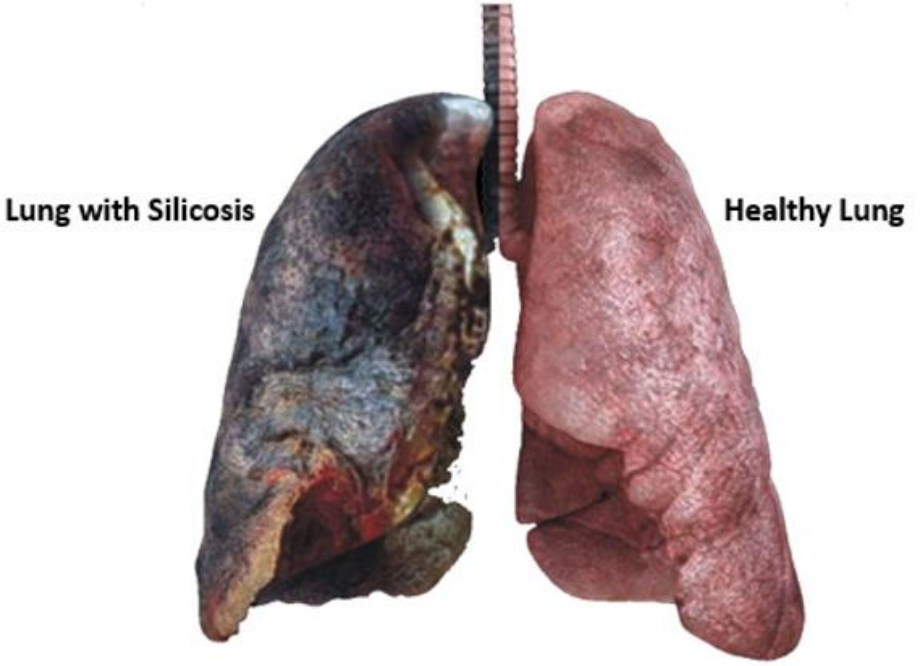
Diseases of Silica Dust Exposure

- Silicosis
- Increased risk of pulmonary tuberculosis
- Lung cancer
- Chronic obstructive pulmonary disease (COPD)
- Kidney diseases
- Autoimmune diseases

HIV synergy with TB & silica

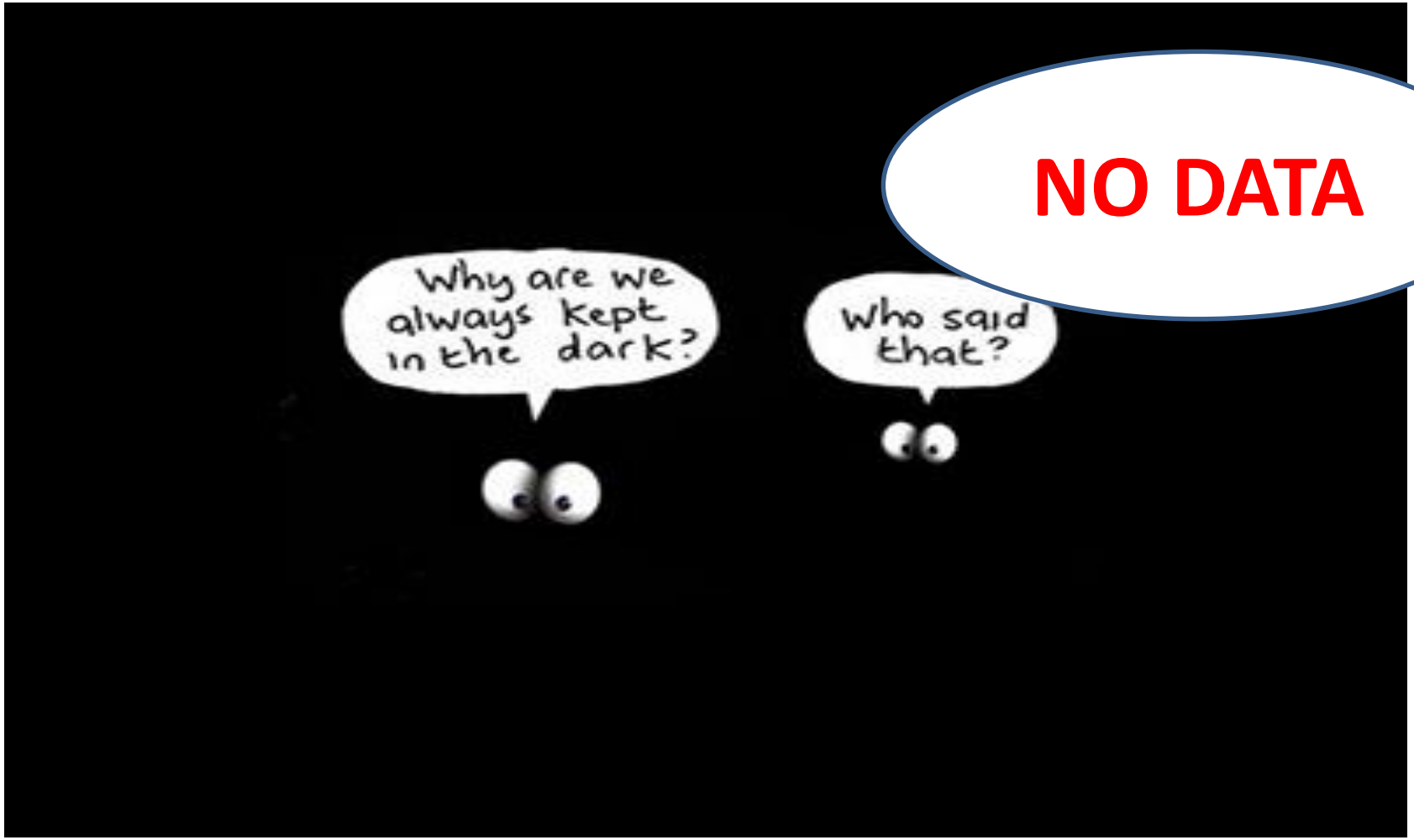
Silicosis

Silicosis is a **progressive, irreversible lung disease**. Silicosis is classified as several different types (simple silicosis, progressive massive fibrosis, acute silicosis, and accelerated silicosis).



Get worse over time & lead to disability or death

Silicosis and the construction industry in South Africa



Scand J Work Environ Health 2005;31 suppl 2:49–56

The health and well-being of older construction workers

Claire Deacon[a,*], John Smallwood[a], Theo Haupt[b]

Risk assessment of silicosis and lung cancer among construction workers exposed to respirable quartz

by Evelyn Tjoe Nij,[1] Dick Heederik[2]

The International Labour Inspectorate and the World Health Organization (WHO) launched an international program aimed at the global reduction and elimination of silicosis (55). WHO recognize

Pneumoconiosis and emphysema in construction workers: results of HRCT and lung function findings

E Meijer,[1] E Tjoe Nij,[1] T Kraus,[2] J S van der Zee,[3] O van Delden,[3] M van Leeuwen,[4] J W Lammers,[4] D Heederik[1]

Occup Environ Med: fir

Management silicosis

- Primary Prevention
  - prevent disease before it ever occurs
  - by preventing exposures to hazards that cause disease **~ HIRA**
  - altering unhealthy or unsafe behaviours that can lead to disease

REPUBLIC OF SOUTH AFRICA

No. 85 of 1993: Occupational Health and Safety Act
as amended by
Occupational Health and Safety Amendment Act, No. 181 Of 1993

Government Notice. R: 1179 **25 August 1995**

Hazardous Chemical Substances Regulations, 1995

OEL Crystalline Silica

USA: 0.05 mg/m3

RSA: 0.1

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

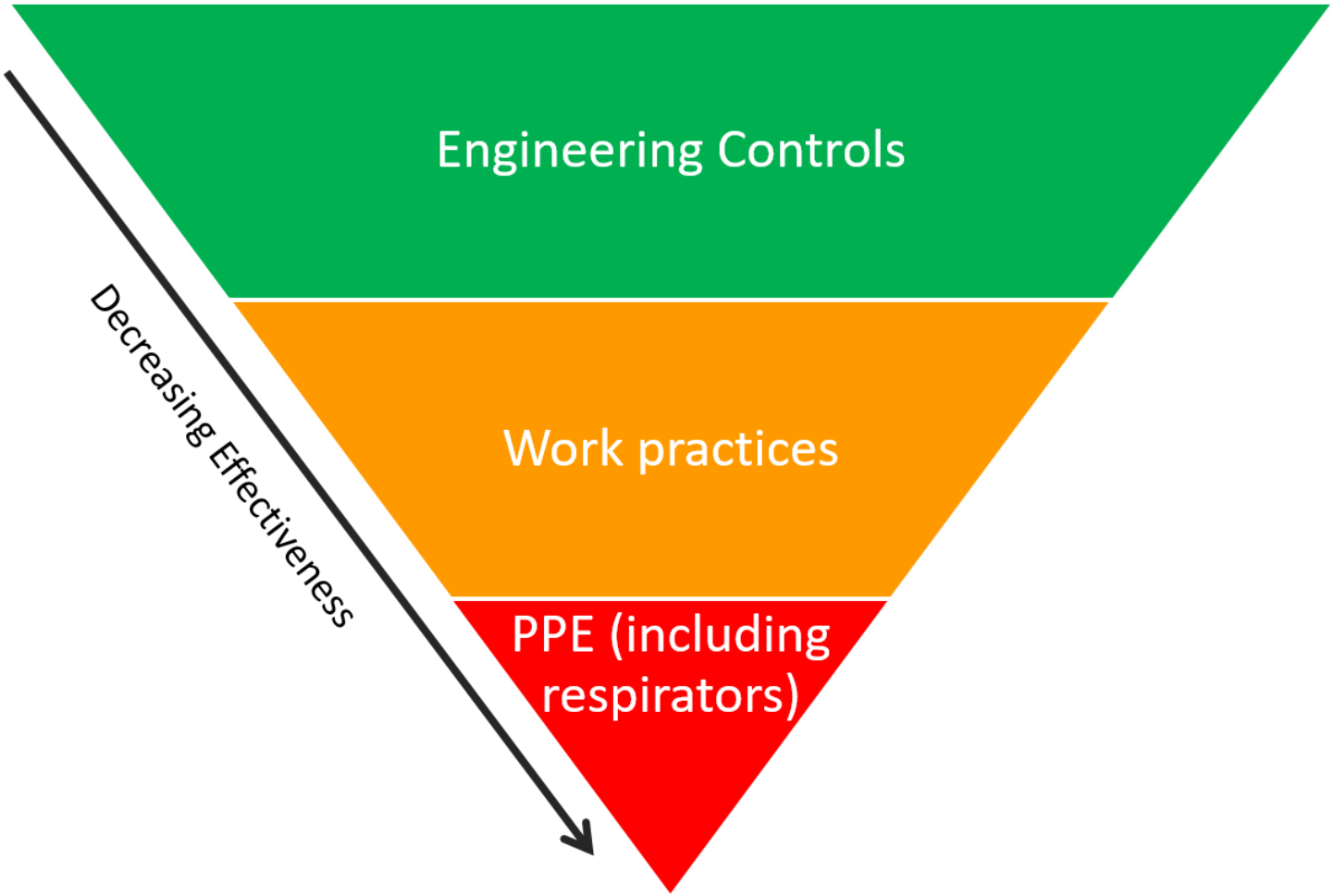
CONSTRUCTION REGULATIONS, 2014

NO. 130 OF 1993: COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT,

STATE PRESIDENT'S OFFICE

Protecting Employees

Hierarchy of Controls



Engineering Controls

Cutting block
without engineering controls

Cutting block using water to control the dust

Secondary Prevention

- Reduce the impact of silicosis
  - detecting and treating as soon as possible to halt or slow its progress
  - Risk based medical surveillance

Tertiary prevention

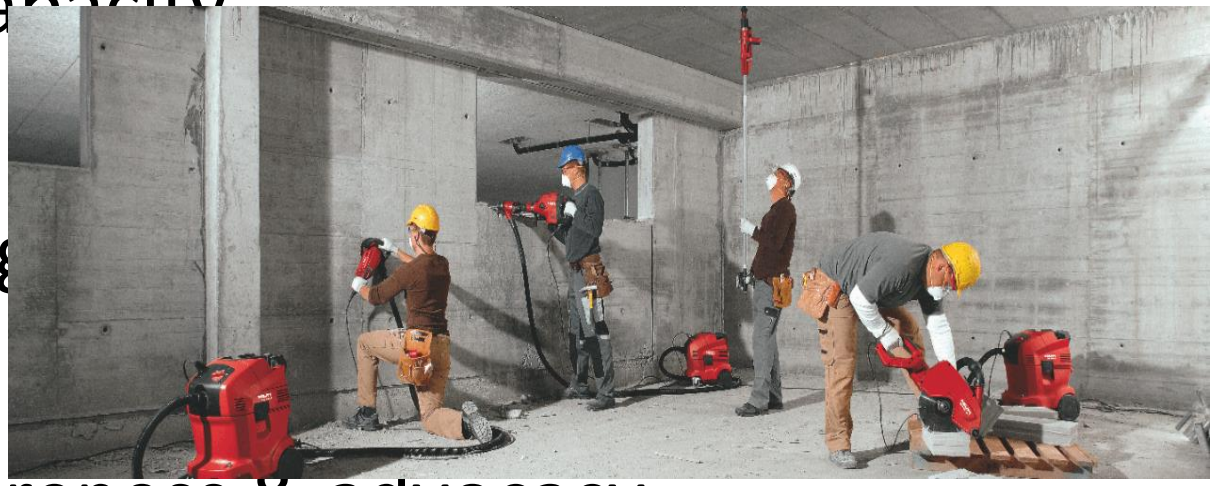
- Rehabilitation
- Compensation
- Reasonable accommodation

Challenges

- Occupational health services **~ latency period for silicosis**
- Information & research
- Human resources

Where too now?

- Enforcement ca
- Compliance (e.g
- Education, awareness & advocacy
- Data / Information access
- Capacity for public sector health workers



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