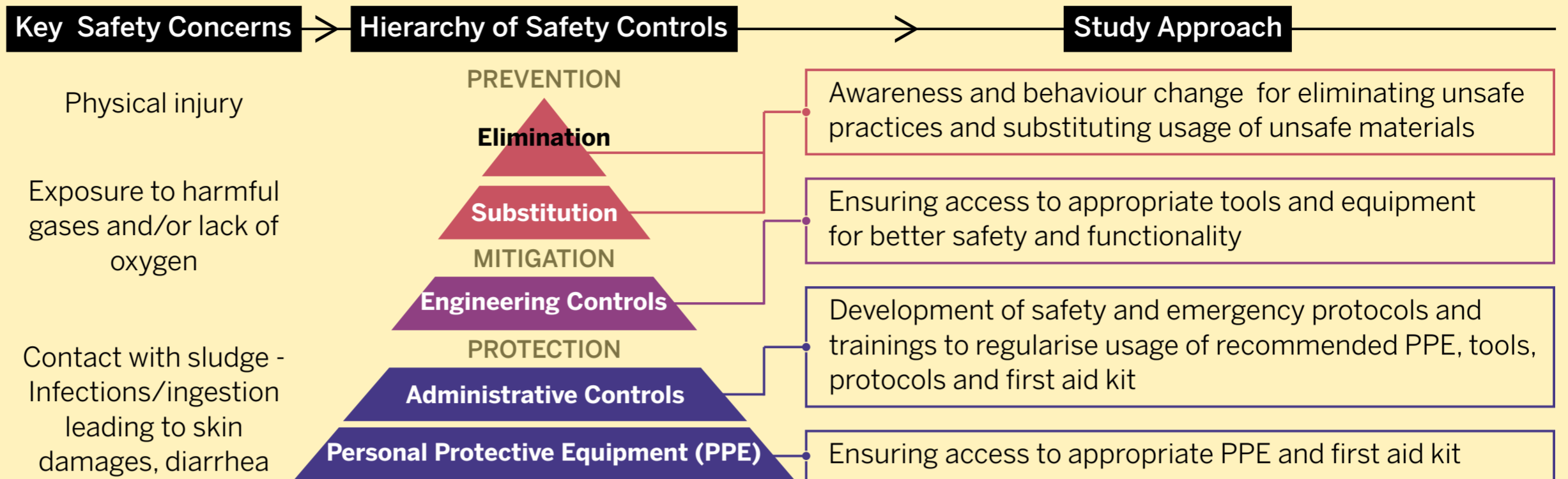


Feasibility of Solutions to Improve Occupational Safety of Desludging Workers

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- An earlier study conducted to identify safety concerns amongst desludging workers.
- As a next step, a set of measures and feasibility of these solutions to improve occupational safety of desludging workers have been tested.



Mitigating Safety Concerns through Engineering Controls - Tools and Equipment

Examples of Field Tested Tools and Equipment

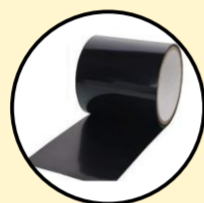
General Safety Tools



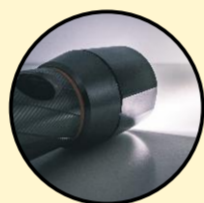
Caution Tape
To cordon off the area of operation



Cone Barrier
To demarcate area of operation



Flex Tape
To fix leakage in hoses/pipe



Torch
To check quantity of sludge in the septic tank

Septic Tank Blockage Removal and Desilting Tools

Motorised Outdoor Drain Cleaner



Removes all kinds of blockages inside the septic tank up to 100 feet

Hand-held Desilting Collection Tool



Collects silt inside septic tank up to 3 meter

Methodology: Identification and field testing safe tools and equipment to address general safety and hazardous desludging steps like assessment of harmful gases and blockage removal.

Tools and Equipment Requiring Further Testing & Adaptations

Tools for Assessment of Harmful Gases

Portable Air Blower



Forced air ventilation techniques to remove harmful gases to be field tested

Gas Monitor



Efficacy of gas monitors to test presence of harmful gases and ability of workers to efficiently use it to be explored further

Design Interventions to Septic Tank Lid



Efficiency of incorporating in-built manhole on septic tank lid (for a pipe of around 6" dia) for desludging to avoid major exposure to fecal sludge to be designed and field-tested with desludging workers.

Protecting Workers from Safety Concerns through PPE & First Aid Kits

Priority set of PPE identified in discussions with workers and suggested outcomes from field testing of PPE



Gloves

Snug fit for better tactility. Elbow length and waterproof material to protect hands



Masks

Waterproof to protect against splashes. Better ventilation



Goggles

Anti-fogging glasses that do not hinder vision



Boots

Light weight for easy movement. Puncture-resistant sole to use in field



Reflective Jackets

Easy wash and quick dry for daily use. Stain repellent



Head Bands

Waterproof to prevent sweat trickling into eyes



Customised First Aid Kit

First aid kit inclusive of medical supplies, safety equipment and medicines and first aid training manual collated based on recommendations from doctors, first aid trainers, safety training institutions and safety laws.

Example of design adaptation being explored for Gloves:

- Elastic cuff and Velcro bands for better grip
- Extendable waterproof materials till forearm
- Nitrile materials for better tactility

Mitigating Safety Concerns through Safety Protocols and Trainings

Safety and Emergency protocols developed to sensitise workers on Do's and Don'ts during desludging process and capacitate workers on proper usage and maintenance of safety tools, PPE and first aid kit.

Prevention of Safety Concerns through Awareness and Behaviour Change

De-sludging Workers: Safety implications of non-usage of PPE, safety tools, and first aid.

Clients/Households: On not throwing non-degradable waste into and using chemicals for toilet/bathroom cleaning.

Masons and Clients: On proper construction of septic tanks as per standards.

Lessons Learned

- Endorsement of recommended well-designed quality PPE and tools by workers is a major challenge considering the cost factor and lack of awareness.
- Efforts to institutionalise occupational safety budget for sanitation workers into the regular government system demands greater attention.
- Successful implementation of any intervention should incorporate the safety significance through regular awareness trainings and behaviour change campaigns.

