Sanitation safety planning (SSP): a practical tool for managing health risks from wastewater reuse

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SANITATION SAFETY PLANNING
MANUAL FOR SAFE USE AND DISPOSAL OF WASTEWATER, GREYWATER AND EXCRETA
Water Scarcity and Reuse in the SDGs

6.3 “By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”

- 6.2.1 Proportion of population using safely managed sanitation services, including a handwashing facility with soap and water
- 6.3.1 Proportion of wastewater safely treated

6.4 “By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity”

- 6.4.1 Change in water-use efficiency over time
- 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
Why Sanitation Safety Planning?

SANITATION SAFETY PLANNING
MANUAL FOR SAFE USE AND DISPOSAL OF WASTEWATER, GREYWATER AND EXCRETA
Sanitation interventions are not very effective
Sanitation interventions are not very effective

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Total No. Studies (Intervention Studies)</th>
<th>Effects from Sanitation</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed feces</td>
<td>10 (7)</td>
<td>Slight reduction in levels of feces (RD -0.03, 95% CI: -0.07 to 0.00)</td>
<td>Very low</td>
</tr>
<tr>
<td>Water quality</td>
<td>9 (3)</td>
<td>No effect</td>
<td>Very low</td>
</tr>
<tr>
<td>Hand contamination</td>
<td>5 (2)</td>
<td>No effect</td>
<td>Very low</td>
</tr>
<tr>
<td>Sentinel object (toys)</td>
<td>1 (1)</td>
<td>No effect</td>
<td>NA</td>
</tr>
<tr>
<td>Surfaces and soil contamination</td>
<td>3 (1)</td>
<td>Mixed effects</td>
<td>Very low</td>
</tr>
<tr>
<td>Food contamination</td>
<td>1 (0)</td>
<td>No effect</td>
<td>NA</td>
</tr>
<tr>
<td>Flies</td>
<td>7 (4)</td>
<td>Reduced fly counts where high levels of coverage and use</td>
<td>Low</td>
</tr>
<tr>
<td>Contamination of water supply by distance to latrine</td>
<td>6 (0)</td>
<td>Inverse relationship between distance of water supply from a latrine and contamination of water supply</td>
<td>Low</td>
</tr>
</tbody>
</table>

2015 systematic reviews for Sanitation Guidelines - indicators of faecal exposure
Produce is an overlooked exposure pathway

Source: SaniPath – Emory University
Why “Safely managed” “Safely treated”?

2014 WHO burden of disease for diarrhoea estimate
A *safe management and reuse system* prevents human contact with excreta at all steps of the sanitation chain.
SSP Steps

1. Describe the sanitation system
2. Identify hazardous events, assess existing control measures and exposure risks
3. Develop supporting programmes and review plans
4. Develop and implement an incremental improvement plan
5. Monitor control measures and verify performance

SANITATION SAFETY PLANNING
Principles

- Hazard identification and risk assessment – investment prioritized according to risk
- Multiple barriers to reduce risk – technical, management, behaviour
- Routine and verification monitoring – visual, process, sampling
- Supporting programmes
- Review and Incremental improvement
Sanitation safety planning

Sanitation Safety Planning (SSP) is a step-by-step risk based approach to assist in the implementation of the 2006 WHO Guidelines for Safe Use of Wastewater, Excreta and Greywater. The approach can also be applied to all sanitary systems to ensure the system is managed to meet health objectives. The SSP approach requires identifying health risks in the sanitation system, implementing an improvement plan and conducting regular monitoring. SSP can be used at the planning stage for new schemes, and to improve the performance of existing systems.

Sanitation safety planning manual
Publication and downloading information

Further information
Sanitation safety planning in this MOOC

Watch a short overview of SSP in this MOOC
Download the video clip
Example

- Inner-city areas
- Planned urban areas
- Informal settlements
- Peri-urban interface
Containment

Exposure Groups:
- users
- workers
- surrounding community

Hazardous events:
- contact with soiled surfaces or extreta
- indirect transfer to mouth
- flies and other vectors

Risks:
- medium to high

Controls or improvement plans:
- Wearing shoes
- Regular cleaning
- Personal protective equipment (PPE) for workers (boots, gloves, and face masks)
- Emptying systems that reduce contact

Monitoring:
- Visual by community health worker
Emptying

Exposure Groups:
- workers

Hazardous events:
- equipment malfunction

Risks:
- high

Controls or improvement plans:
- Appropriate equipment (e.g., long handled shovels and long suction hoses)
- Standard operating procedures (SOPs)
- Personal protective equipment (PPE)

Monitoring:
- collection agency spot checks
Treatment

**Containment**

**Emptying**

**Transport**

**Treatment**

**Reuse/Disposal**

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**Exposure groups:**
- users of the biosolids
- surrounding community members
- consumers of the farm produce
- communities downstream of the treatment plant

**Hazardous events:**
- overloading of the plant,
- breakdowns
- the processing (temperature and time)
- flies or mosquitoes
- seasonal factors

**Risks:**
- high

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**Controls or improvement plans:**
- proper design and construction
- trained operators
- a preventative maintenance programme

**Monitoring:**
- Water sampling and testing
- Delivery volume checks
Reuse/Disposal

**Exposure groups:**
- consumers

**Hazardous events:**
- consumption of contaminated produce

**Risks:**
- high

**Controls or improvement plans:**
- crop types
- pathogen die off before harvesting
- washing

**Monitoring:**
- farm and market inspections
SSP around the World
Potential for reuse as a response to scarcity
Thank you

http://www.who.int/water_sanitation_health/en/