



GUIDELINES ON SANITATION AND HEALTH



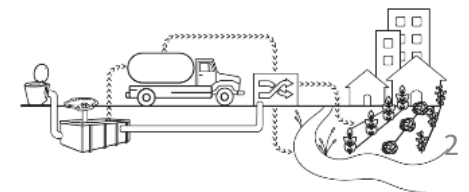
“Sanitation prevents disease and promotes human dignity and well-being, making it the perfect expression of WHO’s definition of health, as expressed in its constitution, as “A state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity...”

The guidelines recognize that safe sanitation systems underpin the mission of WHO, its strategic priorities and the core mission of ministries of health globally.”

WHO Director-General, Dr Tedros Adhanom Ghebreyesus, 1 October 2018

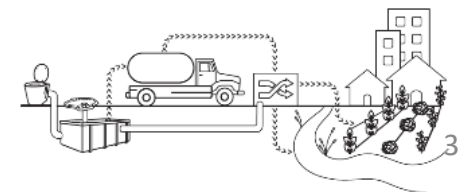


Tedros Adhanom



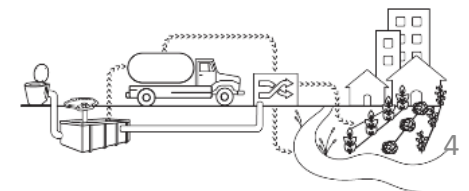
Why are new Guidelines needed?

- Evidence on sanitation shows less health impact than expected
- Ministries of health role in sanitation has declined over the last 50 years
- There is a lack of public health guidance on how to maximize health gains from sanitation



Guidelines Structure

| | |
|---|---|
| Introduction, scope and objectives | Chapter 1: Introduction |
| Recommendations and actions | Chapter 2: Recommendations and good practice actions |
| Implementation guidance | Chapter 3: Safe sanitation systems Chapter 4: Enabling safe sanitation service delivery Chapter 5: Sanitation behaviour change |
| Technical resources | Chapter 6: Microbial aspects Chapter 7: Methods Chapter 8: Evidence on the effectiveness and implementation of sanitation interventions Chapter 9: Research needs Annex I: Sanitation system factsheets Annex II: Glossary of sanitation terms |

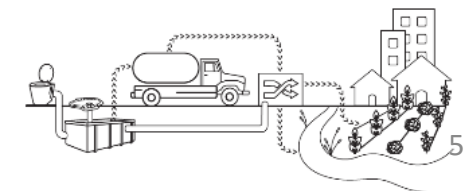
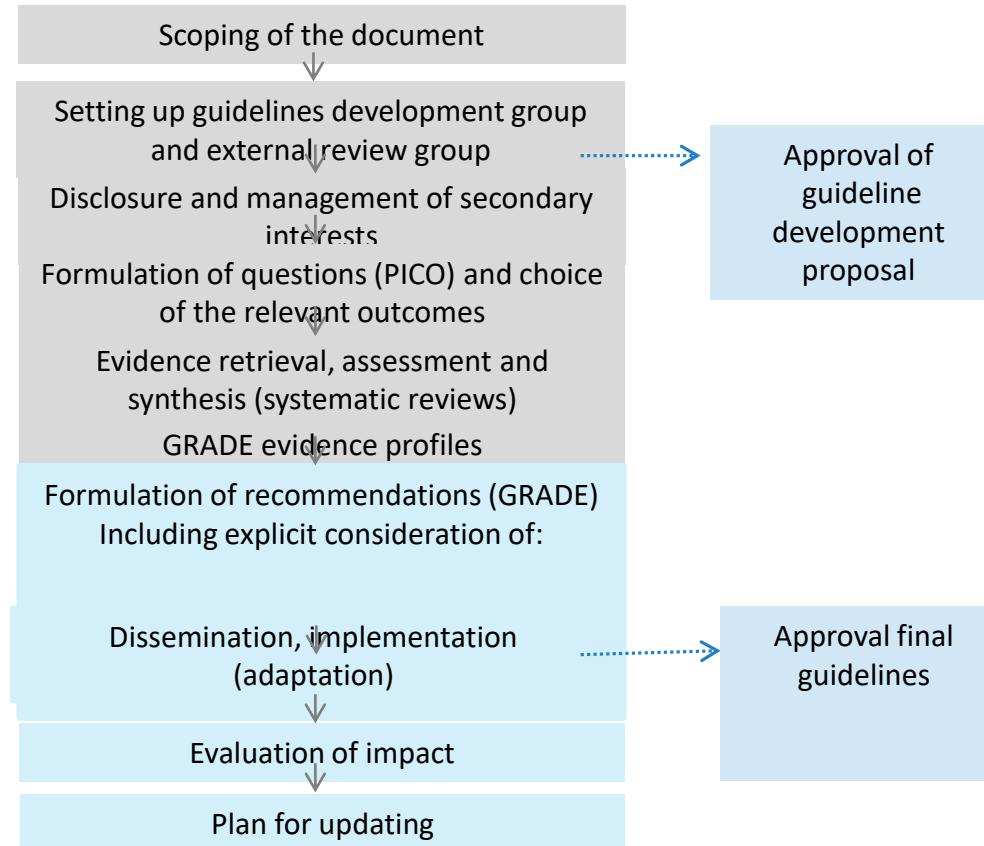


Chapter 7. METHODS

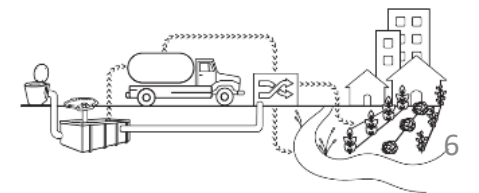
- Guidelines development process

GRADE

DECIDE
GRADE



Introduction Scope and Objectives



Chapter 1:

INTRODUCTION

Objectives

- Maximise the health impacts of sanitation interventions
- Articulate the role of health sector in sanitation

Audiences

- Health and non-health actors involved in sanitation
- National and international organizations responsible for developing policies, standards or guidelines, and programmes on sanitation

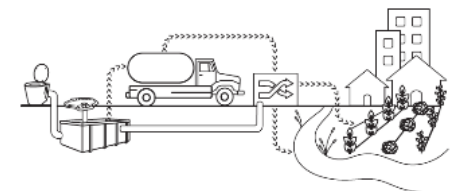
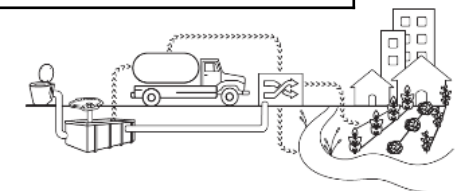
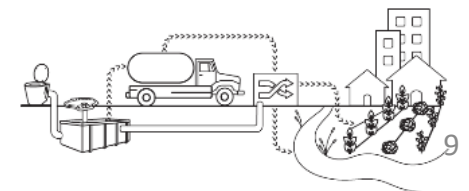
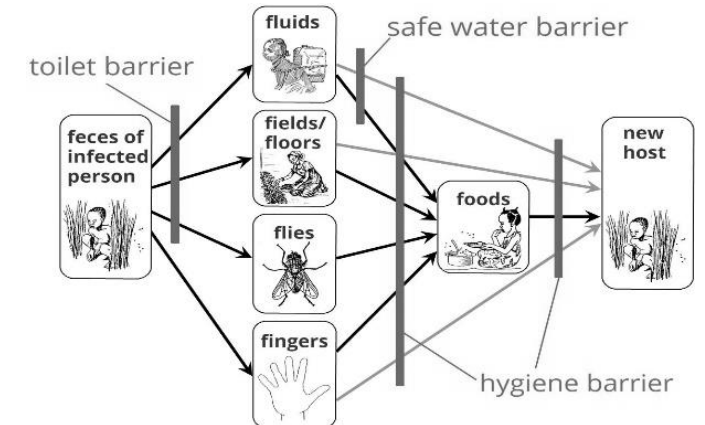
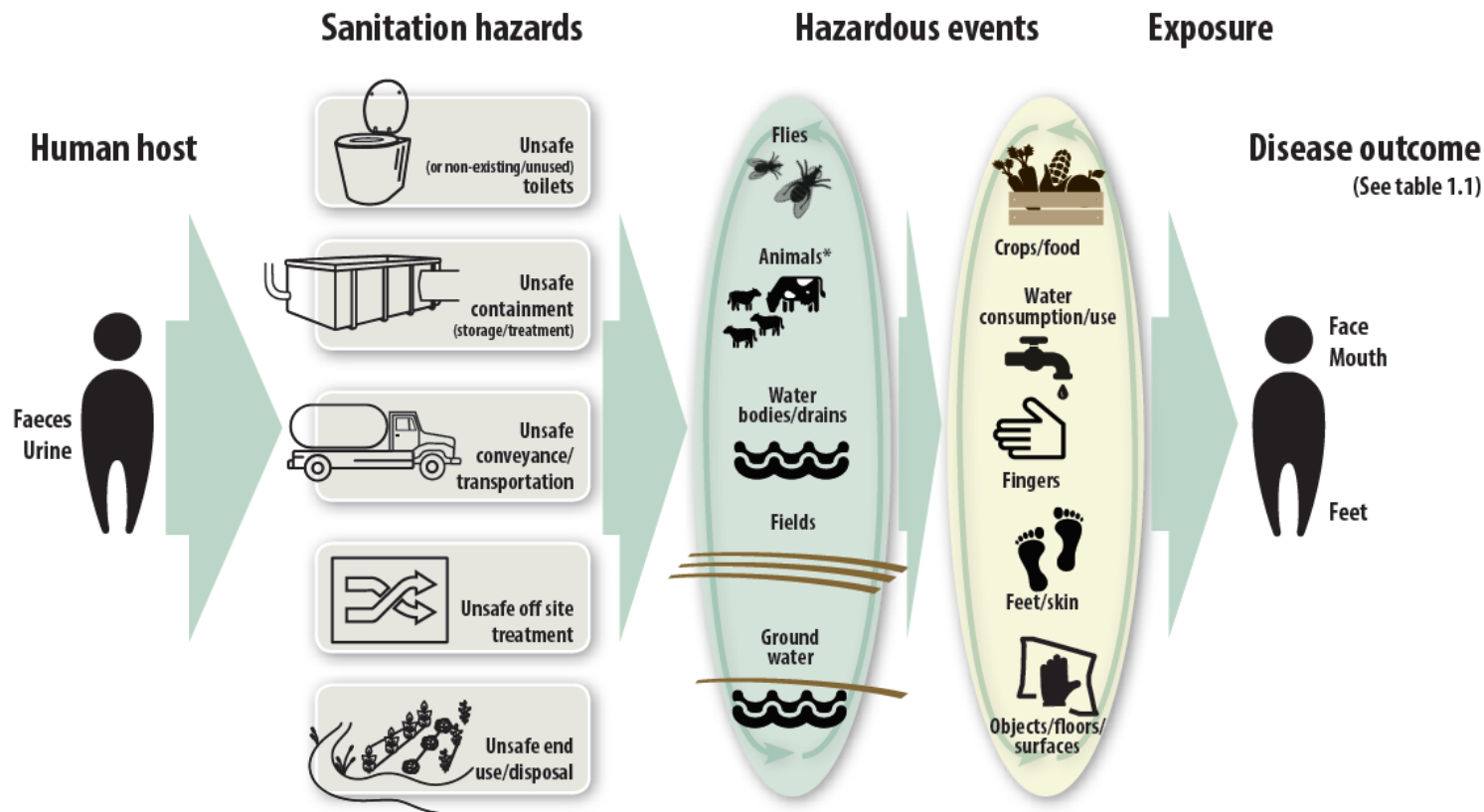


Table 1.1 The health impact of unsafe sanitation

| Direct impact (infections)* | Sequelae (conditions caused by preceding infection) | Broader well-being |
|--|--|---|
| <p>Faecal-oral infections</p> <ul style="list-style-type: none"> • Diarrhoeas (incl. cholera) • Dysenteries • Typhoid <p>Helminth infections</p> <ul style="list-style-type: none"> • Ascariasis • Trichuriasis • Hookworm infection • Cysticercosis • Schistosomiasis <p>Insect vector diseases (vectors breed in faeces or water contaminated with faeces)</p> <ul style="list-style-type: none"> • Lymphatic filariasis • West Nile Fever • Japanese encephalitis • Trachoma | <ul style="list-style-type: none"> • Stunting/ growth faltering - related to repeated diarrhea, helminth infections, environmental enteric dysfunction • Consequences of stunting -obstructed labour, low birthweight • Impaired cognitive function • Pneumonia - related to repeated diarrhea in undernourished children • Anaemia - related to hookworm infections | <p>Immediate:</p> <ul style="list-style-type: none"> • Anxiety (shame and embarrassment from open defecation and shared sanitation) and related consequences • Sexual assault (and related consequences) • Adverse birth outcomes (due to underuse of healthcare facilities with inadequate sanitation) <p>Long-term</p> <ul style="list-style-type: none"> • School absence • Poverty • Decreased economic productivity • Anti-microbial resistance |

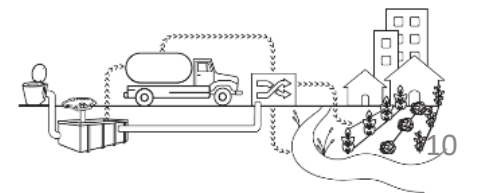


A new F-diagram



Recommendations and Good Practice Actions

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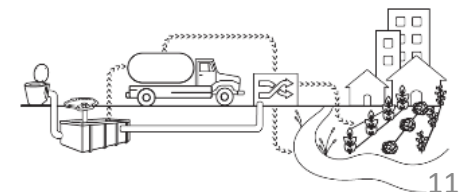
Chapter 2:

RECOMMENDATIONS.....

Derived from comprehensive evidence review and wide expert, and end user input

1 . Universal safe toilets that contain excreta

- Entire community coverage with a minimum level of service
- Using demand side and supply side approaches concurrently
- Shared/public if necessary to reach everyone
- All settings (schools, HCF, etc)
- Equitable progress



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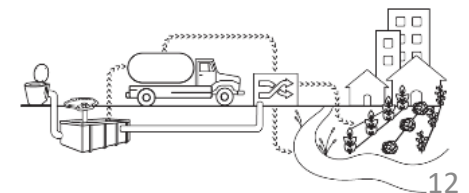
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2. Safe sanitation chain

- Containment, transport, treatment, end use/disposal
- Context specific technologies and services (i.e. technology agnostic)
- Incremental improvement based on local level risk assessment (e.g. SSP)
- Protection of sanitation workers

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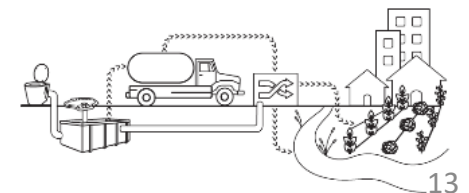
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3. Sanitation as part of local services

- Efficiency with other local services (solid waste, transport, etc).
- Sustainability and health impacts through coordination with other interventions, water supply, hygiene, animal waste, child faeces



Chapter 2: RECOMMENDATIONS.....

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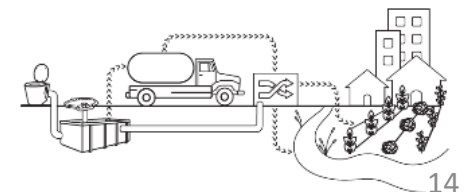
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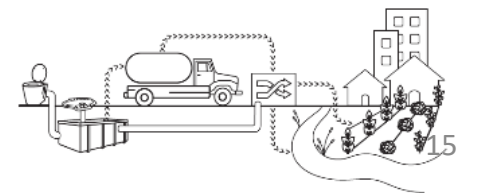
4. Role of the health sector

- Increasing health sector engagement in core functions (but not taking on functions that are better done by others)



Implementation Guidance

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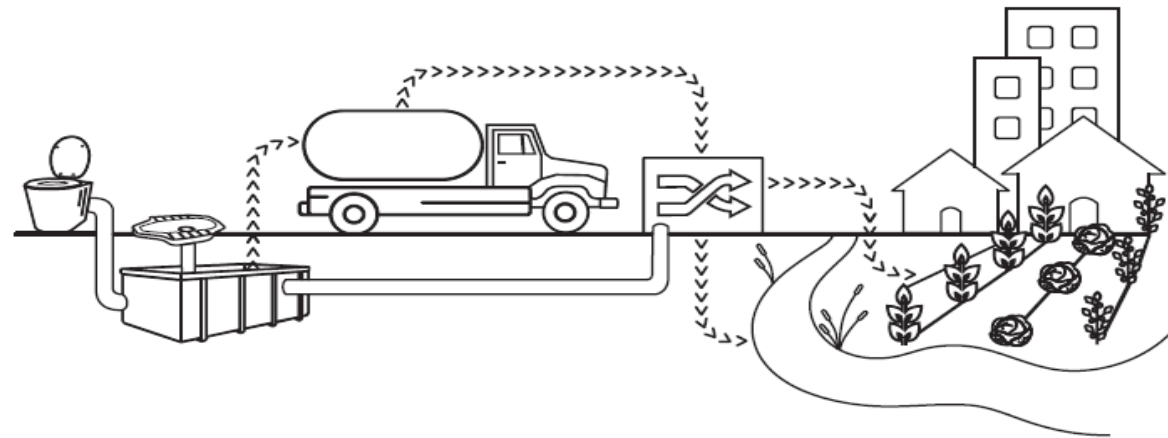


Chapter 3: SAFE SANITATION SYSTEMS

What does safe mean?

Definitions for safe management

- Design & construction
- Operation & maintenance
- Incremental measures



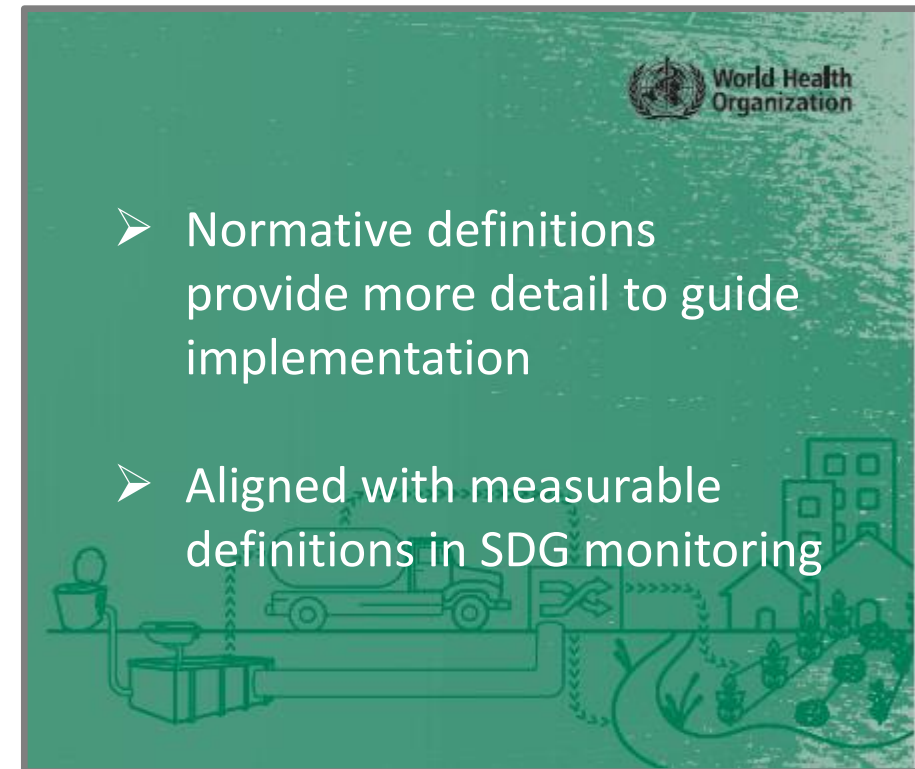
SDG 6.2 Monitoring definitions

VS

GUIDELINES

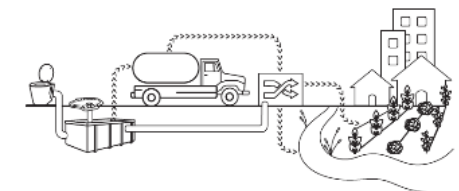
Normative definitions

| Service level | Definition |
|-----------------|---|
| Safely managed | Use of improved facilities which are not shared with other households and where excreta are safely disposed in situ or transported and treated off-site |
| Basic | Use of improved facilities which are not shared with other households |
| Limited | Use of improved facilities shared between two or more households |
| Unimproved | Use of pit latrines without a slab or platform, hanging latrines or bucket latrines |
| Open defecation | Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste |



World Health Organization

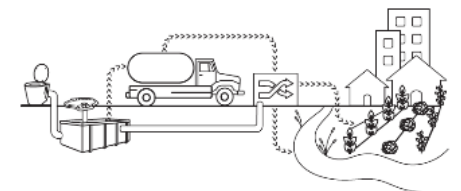
- Normative definitions provide more detail to guide implementation
- Aligned with measurable definitions in SDG monitoring



Chapter 4:

ENABLING SAFE SANITATION SERVICE DELIVERY

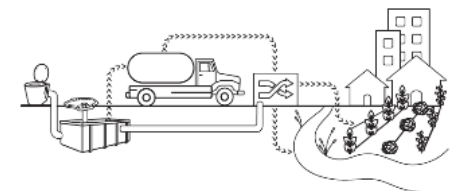
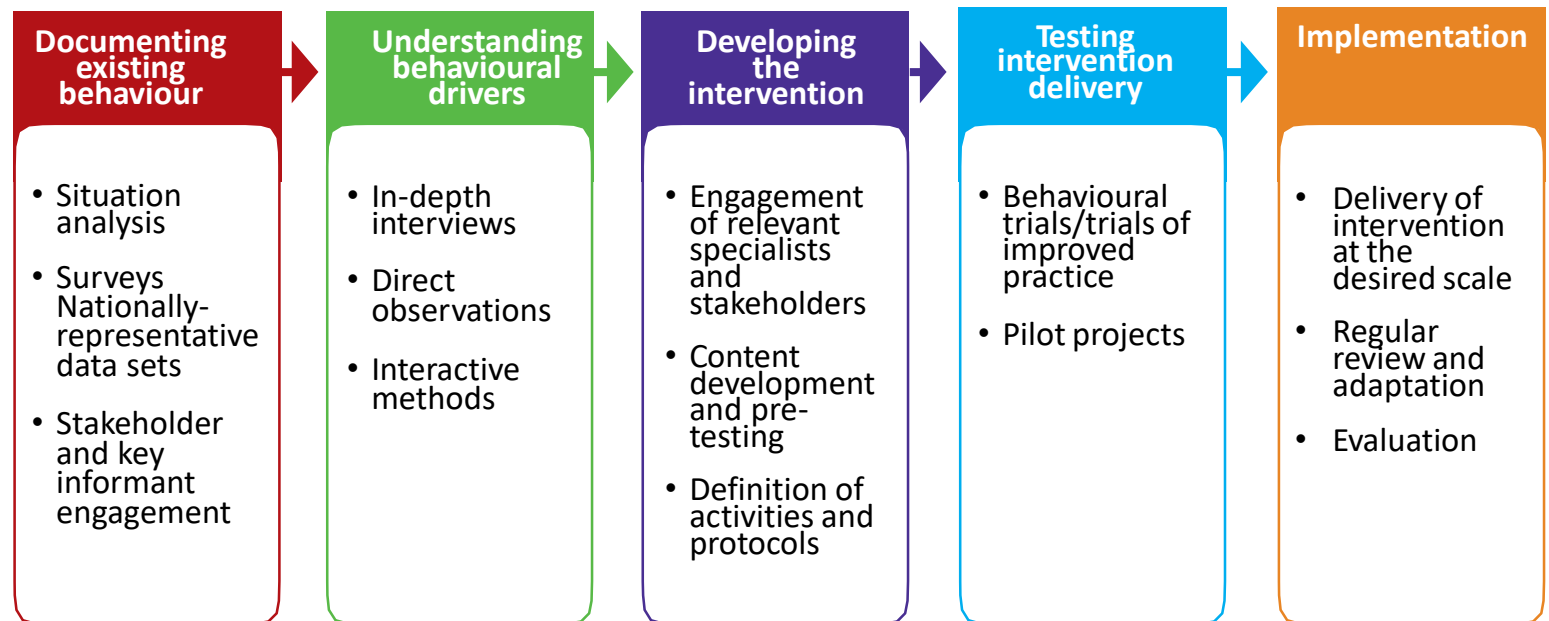
- Government-led multi-sectoral sanitation ***policies and planning***
- Health protective ***legislation, regulations, standards, guidelines***
- ***Roles and responsibilities*** including the role of health authorities
- ***Local level risk assessment*** and delivering sanitation at the local level
- Developing sanitation services and ***business models and the sanitation market***
- Management of ***special risks*** (emergencies, outbreaks, HCF)



Chapter 5: BEHAVIOUR CHANGE

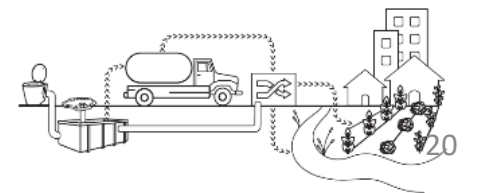
Table 5.2: Stages in behavior change strategy design

- Understanding sanitation behaviours and determinants
- Approaches & intervention design
- Institutional responsibilities
- Monitoring & learning



Technical Resources

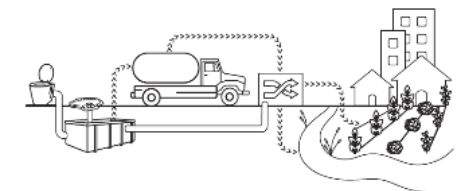
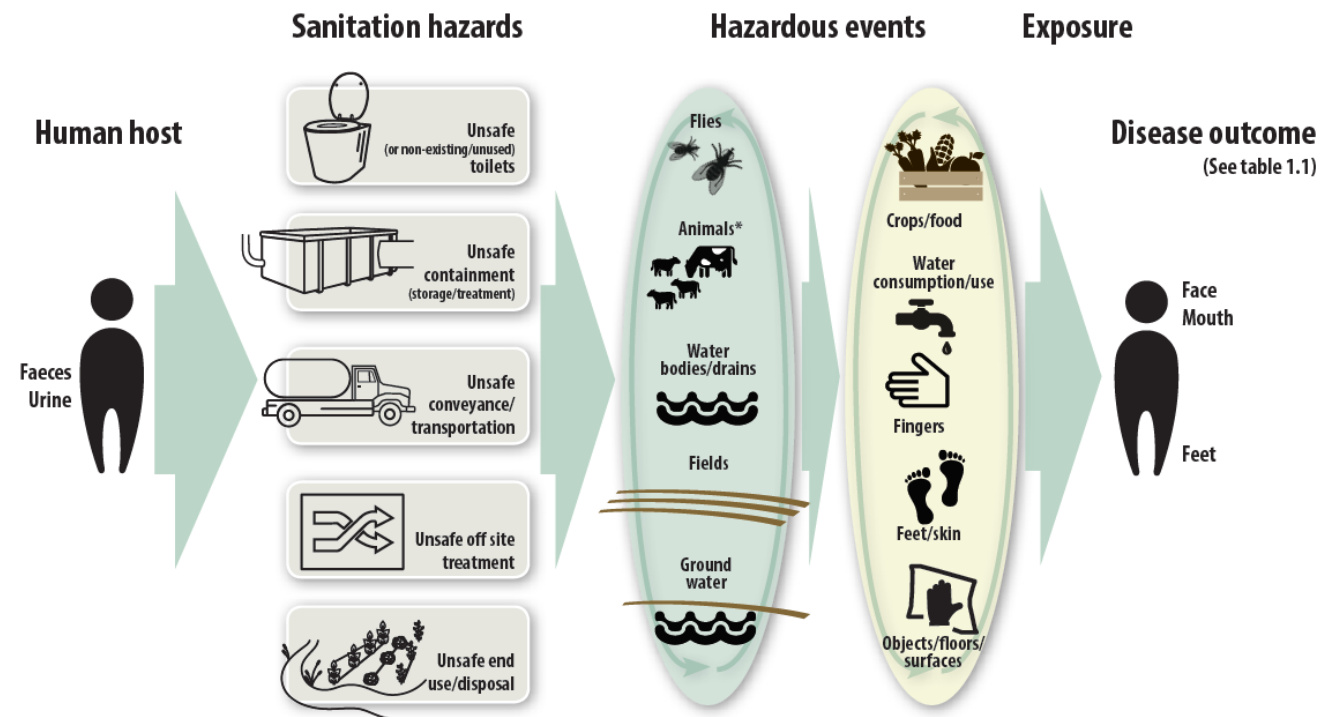
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Chapter 6.

EXCRETA RELATED PATHOGENS

- An updated **F-diagram**
- Sanitation related **pathogens**
- **Treatment and control**
- Focus on emerging ***Antimicrobial resistance***

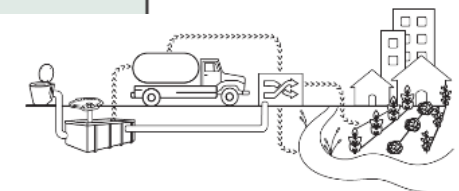


Chapter 6.

EXCRETA RELATED PATHOGENS

Table 6.1 Excreta-related pathogens (main source: Mandell, Bennett & Dolin, 2000)

| Pathogen | Health significance | Transmission pathways | Important animal source | Likely importance of sanitation for control† | Concentration excreted in faeces | Duration of excretion | Additional references |
|---|---|--|--|--|--------------------------------------|--------------------------|-------------------------|
| BACTERIA | | | | | | | |
| <i>Campylobacter</i> spp. | Most common bacterial | Predominantly food and water | Poultry and other | Low | 10 ⁶ – 10 ⁹ /g | Up to 3 weeks | |
| VIRUSES | | | | | | | |
| Adenoviruses | A large group of distinct viruses | Person-to-person, through both | None – strict human | Low | 10 ¹¹ /g (lower with | Months after | |
| PROTOZOA | | | | | | | |
| <i>Cryptosporidium</i> spp. | One of the most common causes of diarrhoea in | Person-to-person, and there is a larva | Of the two main species, <i>C. parvum</i> can infect multiple | High | — | — | Hunter & Thompson, 2005 |
| <i>Clostridi</i> | | | | | | | |
| HELMINTHS | | | | | | | |
| <i>Ascaris lumbricoides</i> (roundworm) | One of the most common human helminth infections globally. Largely asymptomatic. Can lead to bowel/intestine obstruction, | Via consumption of contaminated soil and food, and hand contamination. | No (animal roundworm species not thought to be pathogenic to human). | High | 10 ⁶ eggs/g | While infection persists | Bethony et al, 2006 |

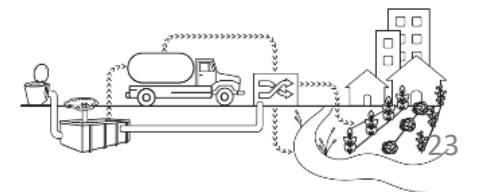


Chapter 8.

EVIDENCE ON THE EFFECTIVENESS AND IMPLEMENTATION OF SANITATION INTERVENTIONS

Brief overview:

- **Limited increase in coverage and use leads to limited impact** on transmission
- Evidence of a **protective effect of sanitation on infectious diseases and nutrition.**
- Evidence of association with **wider health outcomes**, including **cognitive development, personal wellbeing**, especially among women and girls.
- **Strength of the evidence is generally low**, though this may be due in part to limited studies and is common for environmental interventions.
- **Significant gaps** remain in epidemiological, implementation and other areas of sanitation research.



Chapter 9.

RESEARCH NEEDS

- Strategies for encouraging governments to prioritize, encourage and monitor
- Improving coverage and securing correct, consistent, sustained use
- Estimating health impacts from sanitation interventions
- Methods for assessing presence of and exposure to sanitation-related pathogens in the environment
- Leakage and fate of faecal pathogens in the environment
- Alternative designs and services
- Culturally-appropriate interventions respect human dignity and rights
- Mitigating occupational exposures
- Links between sanitation, animals and their impact on human health
- Sanitation and gender

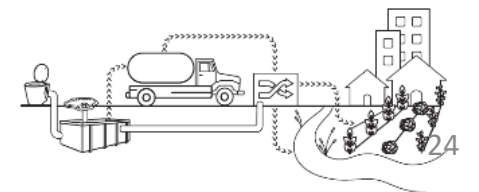
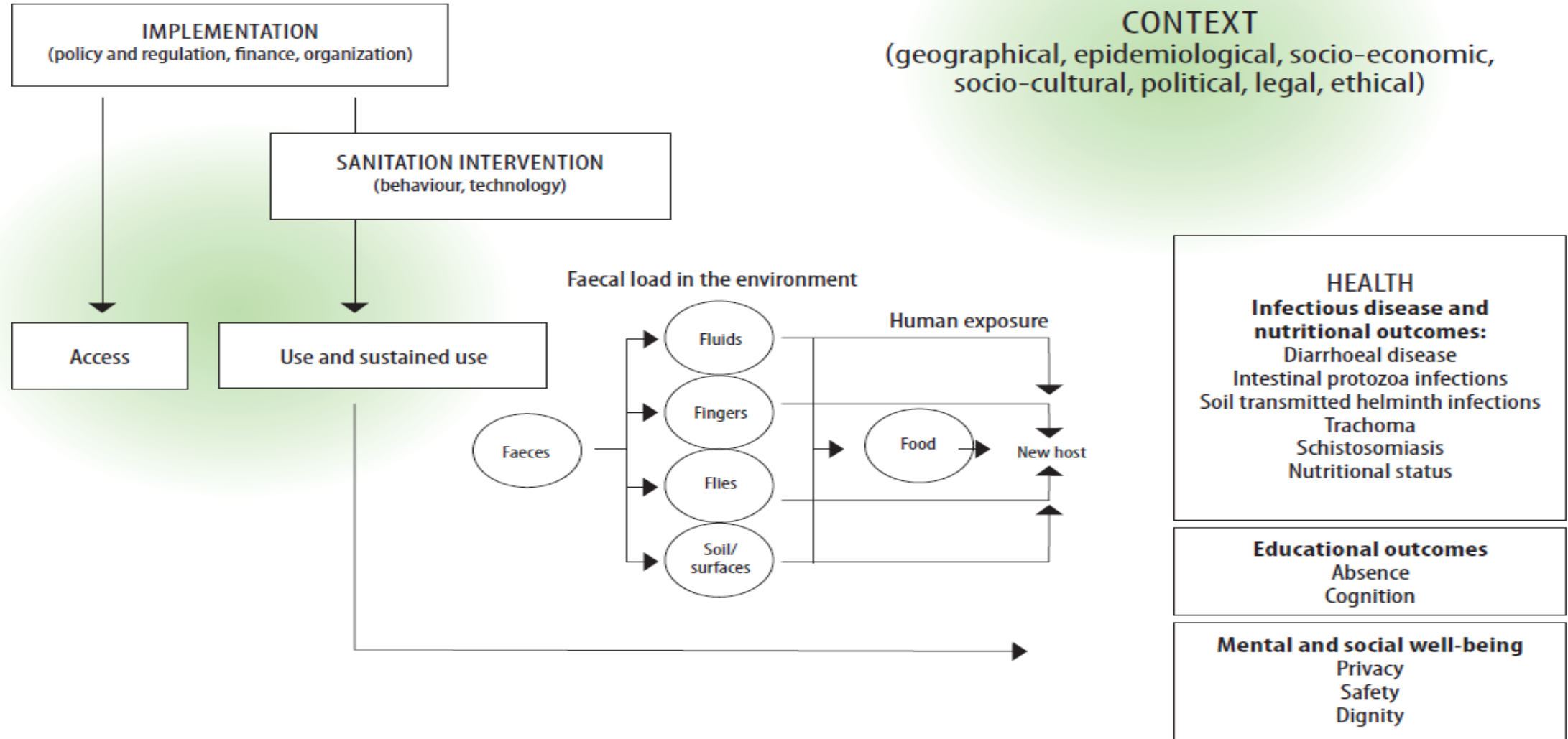


Figure 7.1 Conceptual framework for guidelines development



Annex 1.

SANITATION SYSTEM FACT SHEETS

- 11 system fact sheets covering applicability, design considerations and measures to protect public health

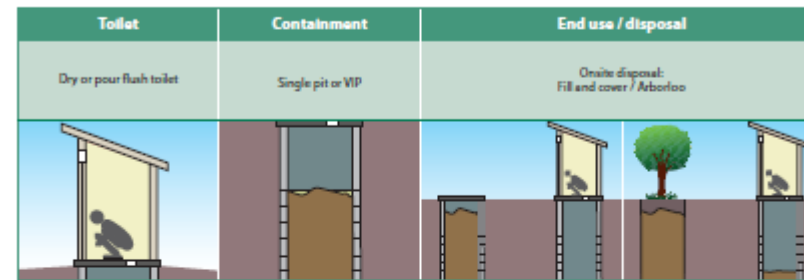
- Accompanying sanitary inspection forms

Coming soon

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Factsheet 1

Dry or flush toilet with onsite disposal



Summary

This system is based on the use of a single pit technology to collect and store excreta. The system can be used with or without flushwater, depending on the toilet. Inputs to the system can include urine, faeces, cleansing water, flushwater and dry cleansing materials. The use of flushwater, cleansing water and cleaning agents will depend on water availability and local habit. The toilet for this system can either be a dry toilet or a pour flush toilet. A urinal could additionally be used. The toilet is directly connected to a single pit or a single ventilated Improved pit (VIP) for containment. As the pit fills up, leachate permeates from the pit into the surrounding soil.

When the pit is full, it can be backfilled with soil and a fruit or ornamental tree can be planted. The sludge acts as a soil conditioner with the increase in organic matter resulting in improved water holding capacity and providing additional nutrients, which are slowly reduced over time. A new pit has to be dug and this is generally only possible when the existing superstructure is mobile.

Applicability

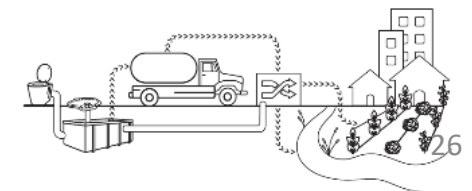
When it is not possible to dig a deep pit or the ground-water level is too high, a shallow, raised pit can be a viable alternative: the shallow pit can be extended by building the pit upwards with the use of concrete rings or blocks. A raised pit can also be constructed in an area where flooding is frequent in order to keep water from flowing into the pit during heavy rain¹.

Cost: This system is one of the least expensive to construct in terms of capital cost and maintenance cost, especially if the superstructure is mobile and can be reused^{2,3}.

Design considerations

Toilet: The toilet should be made from concrete, fibreglass, porcelain or stainless steel for ease of cleaning and designed to prevent stormwater from infiltrating or entering the pit^{2,3}.

Containment: On average, solids accumulate at a rate of 40 to 60L per person/year and up to 90L per person/year if dry cleansing materials such as leaves or paper are used. In more arid regions, arborloos, toilets with



...Also coming soon:

EXCRETA RELATED PATHOGEN FACT SHEETS

- Harmonized with Drinking water quality factsheets and the global water pathogens project (GWPP)

Coming soon

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11.1 Bacterial pathogens

Most bacterial pathogens potentially transmitted by water infect the gastrointestinal tract and are excreted in the faeces of infected humans and animals. However, there are also some waterborne bacterial pathogens, such as *Legionella*, *Burkholderia pseudomallei* and atypical mycobacteria, that can grow in water and soil. The routes of transmission of these bacteria include inhalation and contact (bathing), with infections occurring in the respiratory tract, in skin lesions or in the brain.

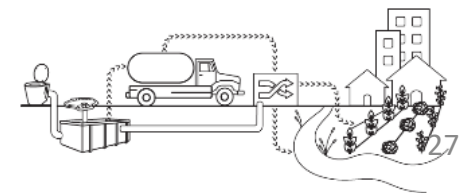
Acinetobacter

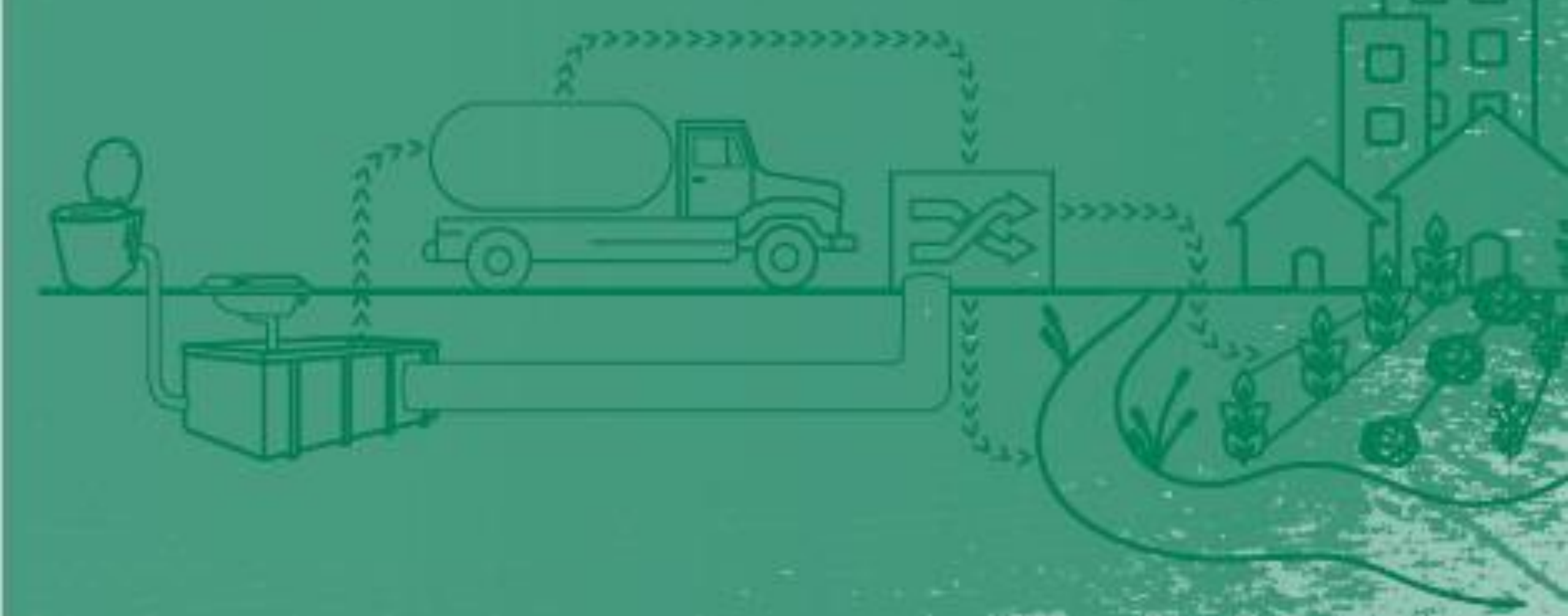
General description

Acinetobacter spp. are Gram-negative, oxidase-negative, non-motile coccobacilli (short plump rods). Owing to difficulties in naming individual species and biovars, the term *Acinetobacter calcoaceticus baumannii* complex is used in some classification schemes to cover all subgroups of this species, such as *A. baumannii*, *A. iwoffii* and *A. junii*.

Human health effects

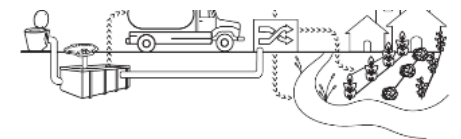
Acinetobacter spp. are usually commensal organisms, but they occasionally cause infections, predominantly in susceptible patients in hospitals. They are opportunistic pathogens that may cause urinary tract infections, pneumonia, bacteraemia, second-



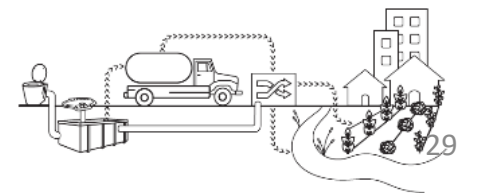


THANK YOU!

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Quiz



Q1: What is the ultimate health outcome the guidelines aim to support?

A. Reduction of 30% of diarrhoea by 2030



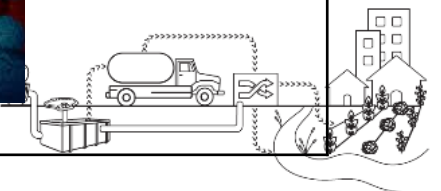
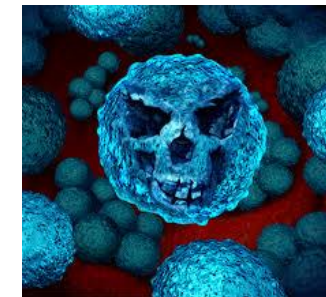
C. A state of complete physical, mental and social wellbeing and not merely the absence of disease



B. Reduced stunting



D. Eliminating the risk of AMR



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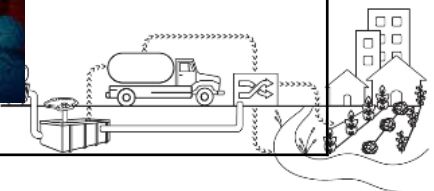
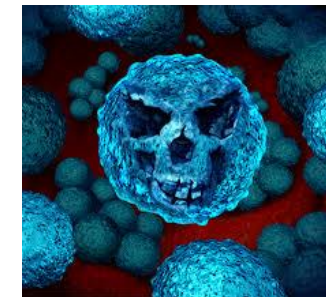
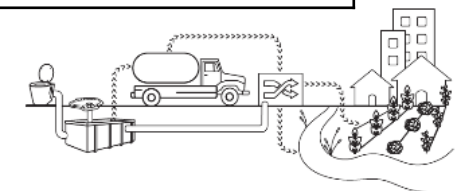


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Q2: What does WHO recommend with regards to shared facilities?

A. Get rid of them!



C. Can be promoted for households as an incremental step when individual household facilities are not feasible

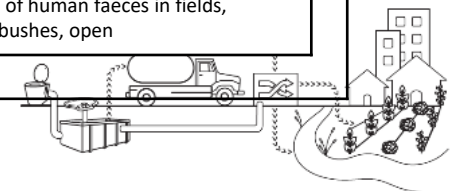


B. Turn them into small scale businesses



D. The SDG6.2 ladders count 'shared' as lower than basic service – therefore shared facilities are not recommended

| Service level | Definition |
|-----------------|---|
| Safely managed | Use of improved facilities which are not shared with other |
| Basic | Use of improved facilities which are not shared with other households |
| Limited | Use of improved facilities shared between two or more households |
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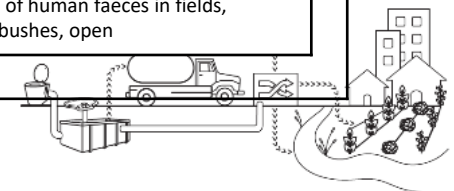


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| Unimproved | Use of pit latrines without a slab or platform, hanging latrines or bucket latrines |
| Open defecation | Disposal of human faeces in fields, forests, bushes, open |



Chapter 2:

RECOMMENDATIONS.....

Derived from comprehensive evidence review and wide expert, and end user input

1. Universal safe toilets that contain excreta

- Entire community coverage with a minimum level of service
- ~~Using demand side and supply side approaches concurrently~~
- **Shared/public if necessary to reach everyone**
- ~~All settings (schools, HCF, etc)~~
- Equitable progress

2. Safe sanitation chain

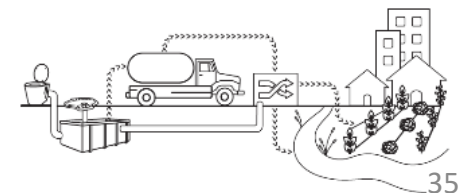
- Containment, transport, treatment, end use/disposal
- Context specific technologies and services (i.e. technology agnostic)
- Incremental improvement based on local level risk assessment (e.g. SSP)
- Protection of sanitation workers

3. Sanitation as part of local services

- Efficiency with other local services (solid waste, transport, etc).
- Sustainability and health impacts through coordination with other interventions, water supply, hygiene, animal waste, child faeces

4. Role of the health sector

- Increasing health sector engagement in core functions (but not taking on functions that are better done by others)



Q3: What is the role of the health sector in sanitation as defined by the guidelines?

A. Nothing.

The sanitation sector is most efficiently managed by utilities and the private sector.



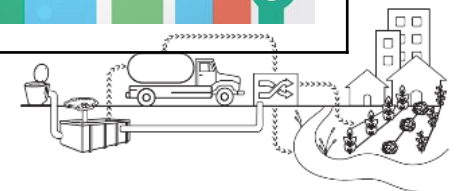
C. The health sector should take over all sanitation sector functions to ensure they protect public health.



B. All healthcare facilities should sell toilet slabs



D. The health sector should fulfil core functions to ensure safe sanitation to protect public health



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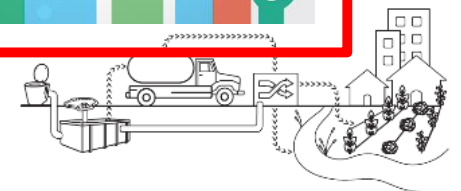
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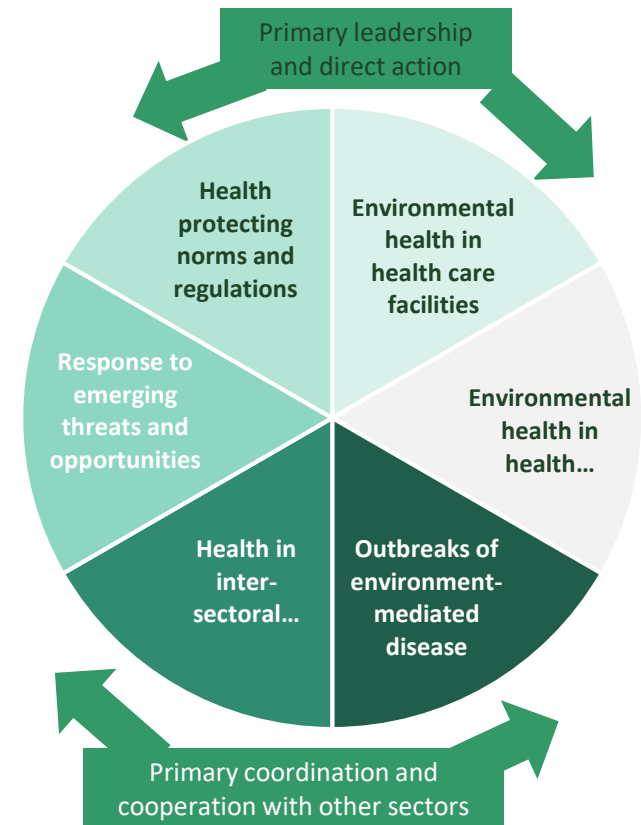


D. The health sector should fulfil core functions to ensure safe sanitation to protect public health

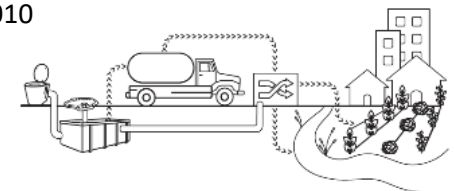


Role of the health sector

- Contribution to sanitation sector coordination
- Health in sanitation policies
- Health protective norms and standards
- Health surveillance
- Health programme delivery
- Sanitation behaviour change
- Healthcare facilities



Bartram & Rehfuess 2010



Q4: How do the guidelines define safe sanitation systems?

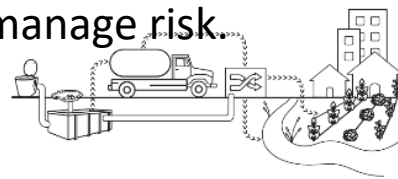
A. Use of improved facilities which are not shared with other households and where excreta are safely disposed in situ or transported and treated off-site

| Service level |
|-----------------|
| Safely managed |
| Basic |
| Limited |
| Unimproved |
| Open defecation |

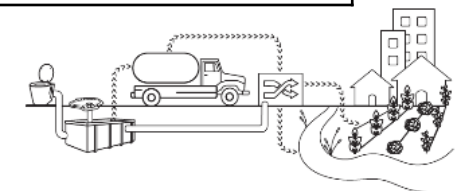
C. Available, accessible, acceptable, affordable for all users



B. Separate human excreta from human contact at all steps of the sanitation service chain. Covers design, operation and maintenance, and incremental measures to manage risk.



D. Toilets with a lock on the (inside of the) door



Q4: How do the guidelines define safe sanitation systems?

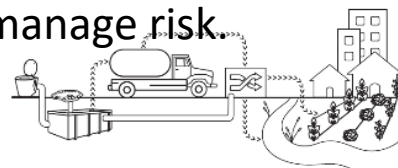
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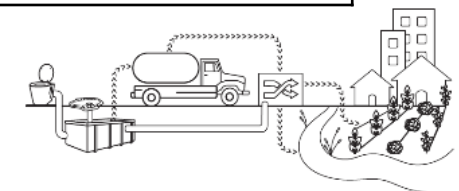
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SDG 6.2 Monitoring definitions

VS

GUIDELINES

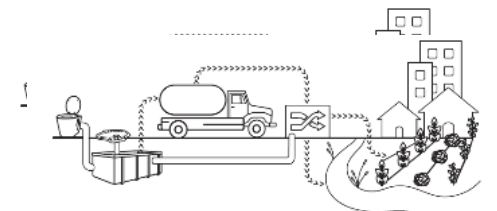
Normative definitions

| Service level | Definition |
|-----------------|---|
| Safely managed | Use of improved facilities which are not shared with other households and where excreta are safely disposed in situ or transported and treated off-site |
| Basic | Use of improved facilities which are not shared with other households |
| Limited | Use of improved facilities shared between two or more households |
| Unimproved | Use of pit latrines without a slab or platform, hanging latrines or bucket latrines |
| Open defecation | Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste |

World Health Organization

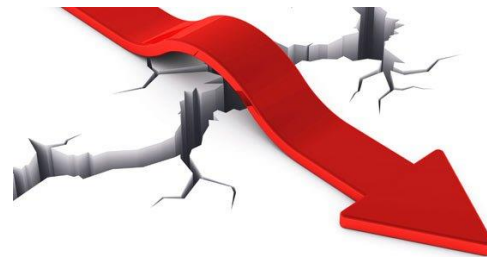
- Normative definitions provide more detail to guide implementation
- Aligned with measurable definitions in SDG monitoring

GUIDELINES ON SANITATION AND HEALTH



Q5: How should local authorities prioritise improvements and manage system performance?

A. Conduct a local level health-based assessment and management



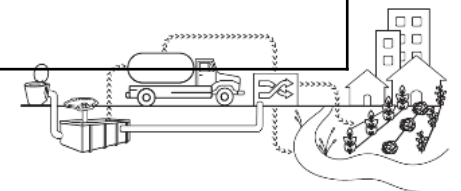
C. Provide services to people who can pay for them



B. Conduct an X-factor style competition to decide where to allocate services

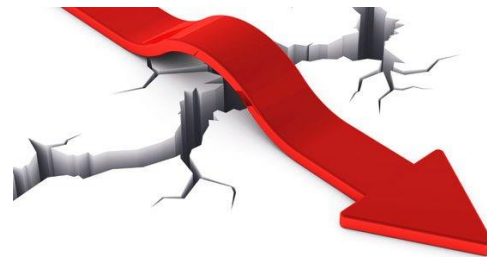


D. Deliver services where it's easy and cheap to do so



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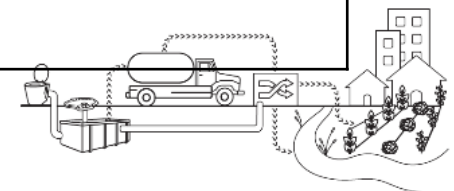
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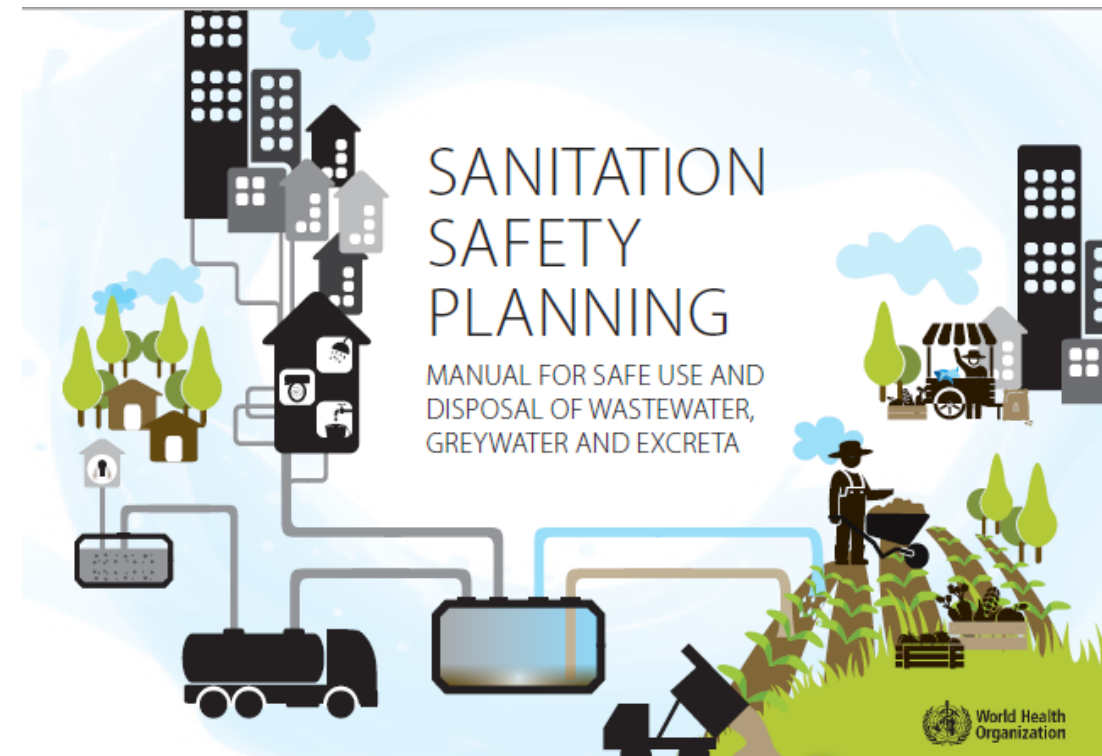
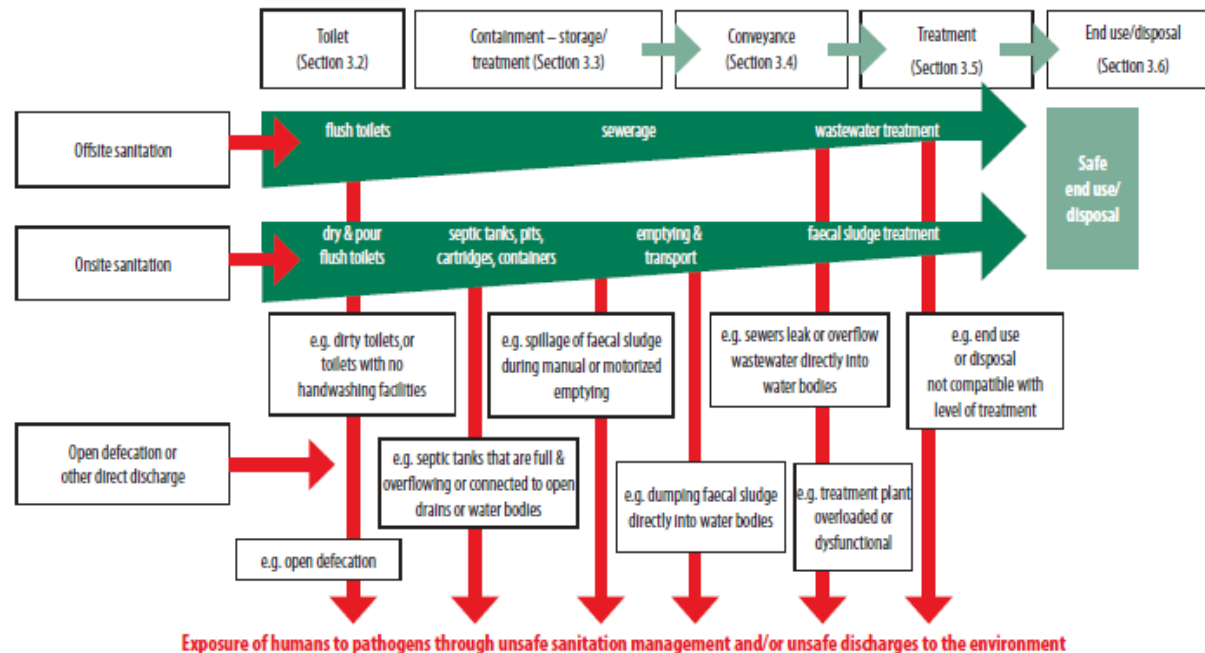


Chapter 2: RECOMMENDATIONS

2. Safe sanitation chain

- Containment, transport, treatment, end use/disposal,
- Context specific technologies and services, (i.e. technology agnostic)
- Incremental improvement based on local level risk assessment
- Protection of sanitation workers

Figure 3.2 Faeces flow diagram showing examples of hazardous events at each step of the sanitation service chain (adapted from Peal et al., 2014)

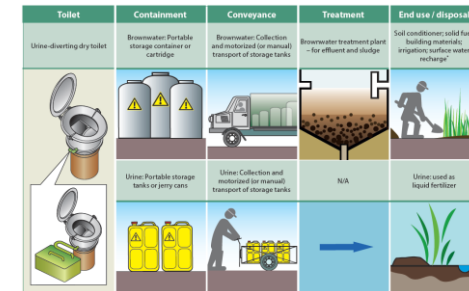


Q6: Which sanitation technology is the best for protecting health?

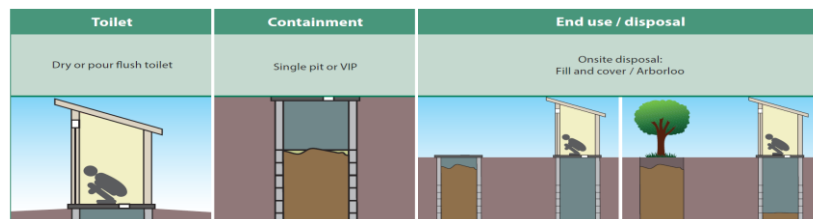
A. Sewerage



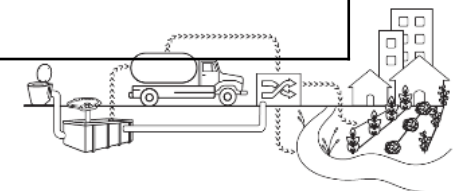
C. Container-based sanitation with off-site composting



B. On-site systems with faecal sludge management



D. None or all of the above, depending on management and context

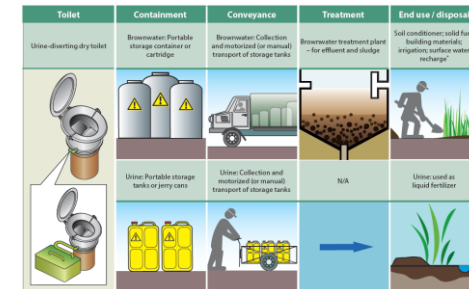


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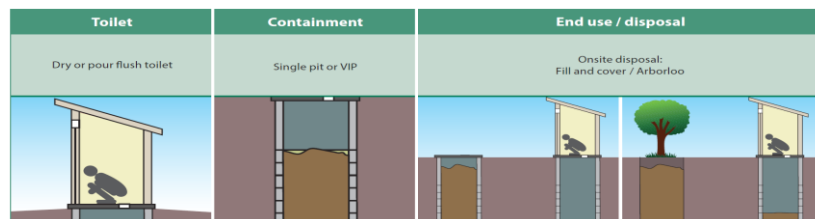
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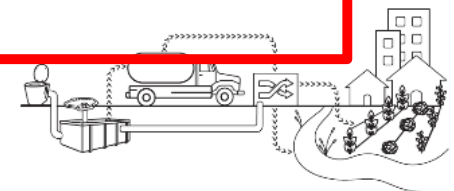


Figure 4.3 Example of phasing out unsafe sanitation over time

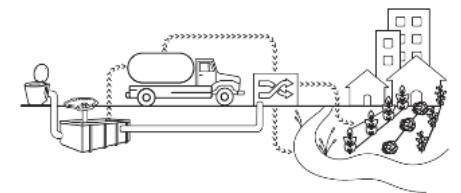
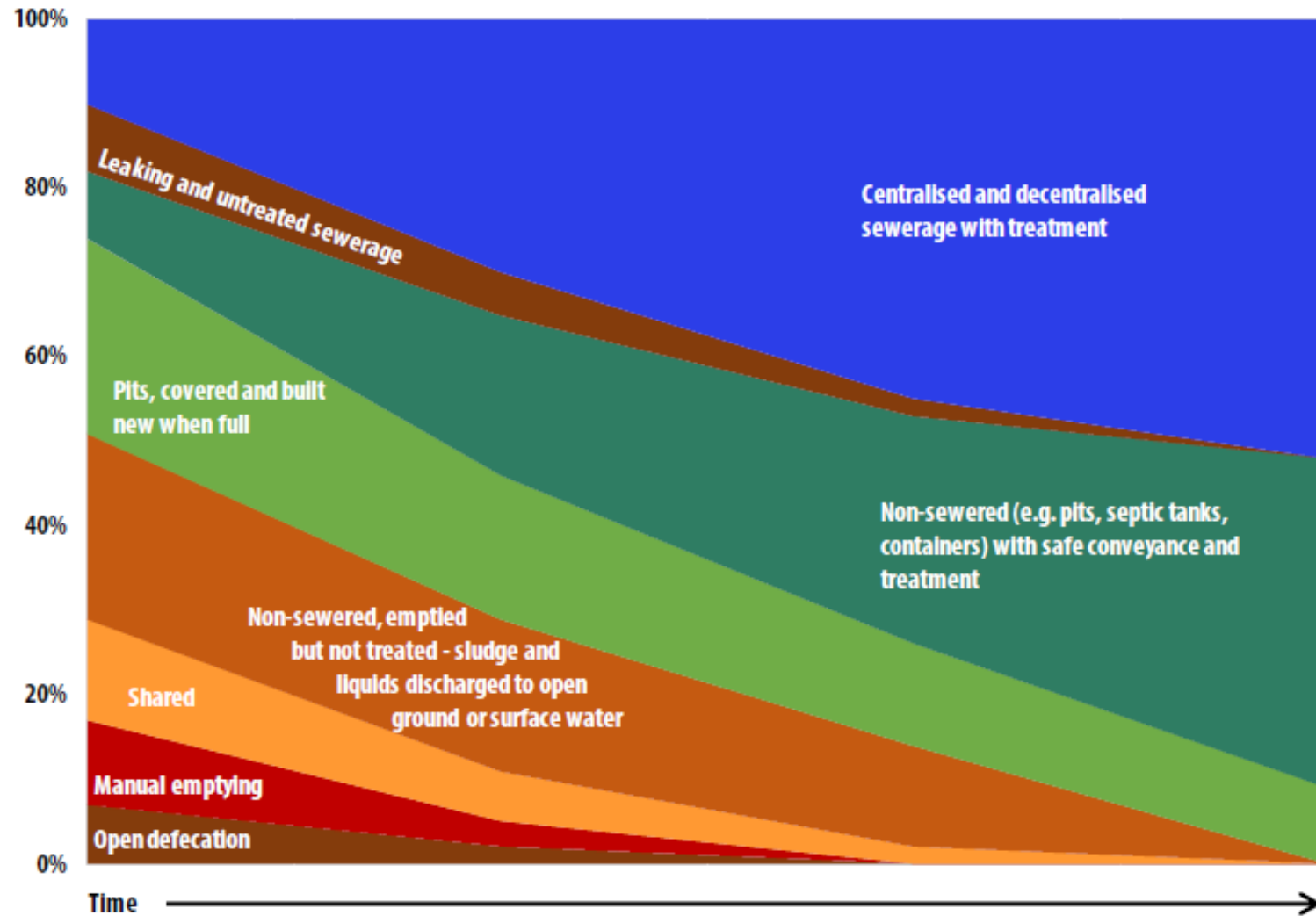
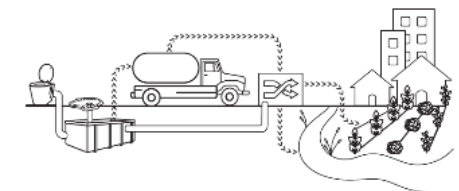


Table 3.5 Applicability of sanitation systems

| Each system is most applicable in the conditions shown (Low/Medium/High): | | Physical factors | | | | | | | Enabling factors | | | | | | | |
|---|---|---|--|---------------------------------|----------------------|------------------------------------|--------------------------------|-------------------|---|----------------------------------|--|---|--|----------------------------------|--|---|
| | | Household level (toilet, containment-storage/treatment, conveyance) | | | | | | | | | | | Public level (conveyance, treatment, end use/disposal) | | | |
| | | Population density is: | Risk to ground water used for drinking is: | Water availability is at least: | Risk of flooding is: | Soil hardness (re: excavation) is: | Soil permeability is at least: | Land availability | HR capacity for infrastructure is at least: | HR capacity for O&M is at least: | Financial capacity for infrastructure is at least: | Financial capacity for O&M is at least: | HR capacity for infrastructure is at least: | HR capacity for O&M is at least: | Financial capacity for infrastructure is at least: | Financial capacity for O&M is at least: |
| Onsite sanitation systems | 1: Dry or flush toilet with onsite disposal | L | L | L | L | L | M | NA | L | L | L | L | NA | NA | NA | NA |
| | 2: Dry toilet or urine diverting dry toilet (UDDT) with onsite treatment in alternating pits or compost chamber | L | L | L | L | L | M | NA | L | M | L | L | NA | NA | NA | NA |
| | 3: Flush toilet with onsite treatment in twin pits | L | L | M | L | L | M | NA | L | L | L | L | NA | NA | NA | NA |
| | 4: Urine-diverting dry toilet (UDDT) with onsite treatment in dehydration vault | L | L | L | NA | NA | NA | NA | M | M | M | M | NA | NA | NA | NA |



Q7: What is the best way to get people to change their sanitation behaviours?

A. Implement CLTS



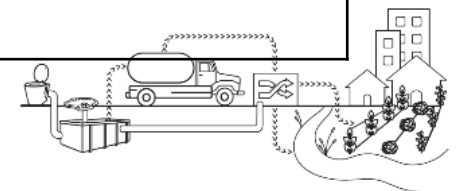
C. Explain to them how poor sanitation affects their health



B. Tell them what to do
– posters are great!



D. Understand what drives behaviour and design a context-specific intervention



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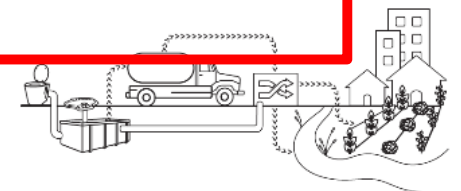
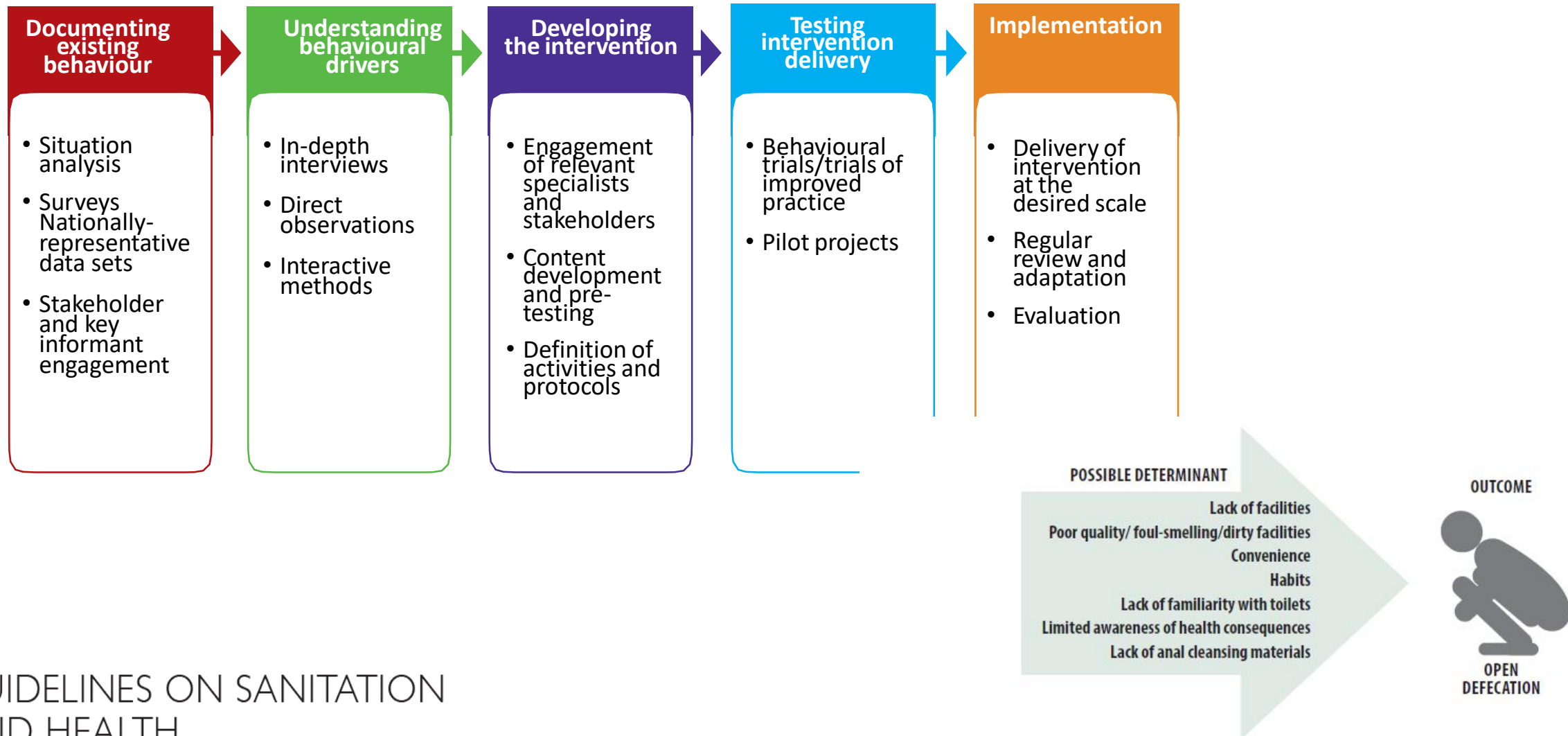


Figure 5.2: Stages in behaviour change strategy design



Q8: How sure are we that safe sanitation systems have a beneficial impact on health?

A. There is evidence that safe sanitation is associated with improvements in health. The quality of evidence tends to be low



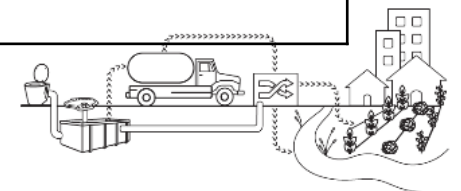
C. We have no evidence. Sanitation is not important for human health. We are going back to the miasma theory



B. We think so, but there is no evidence



D. Don't be so silly



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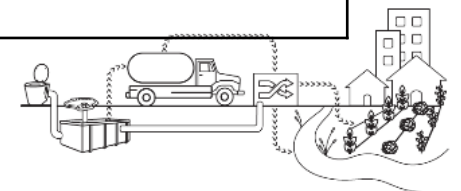
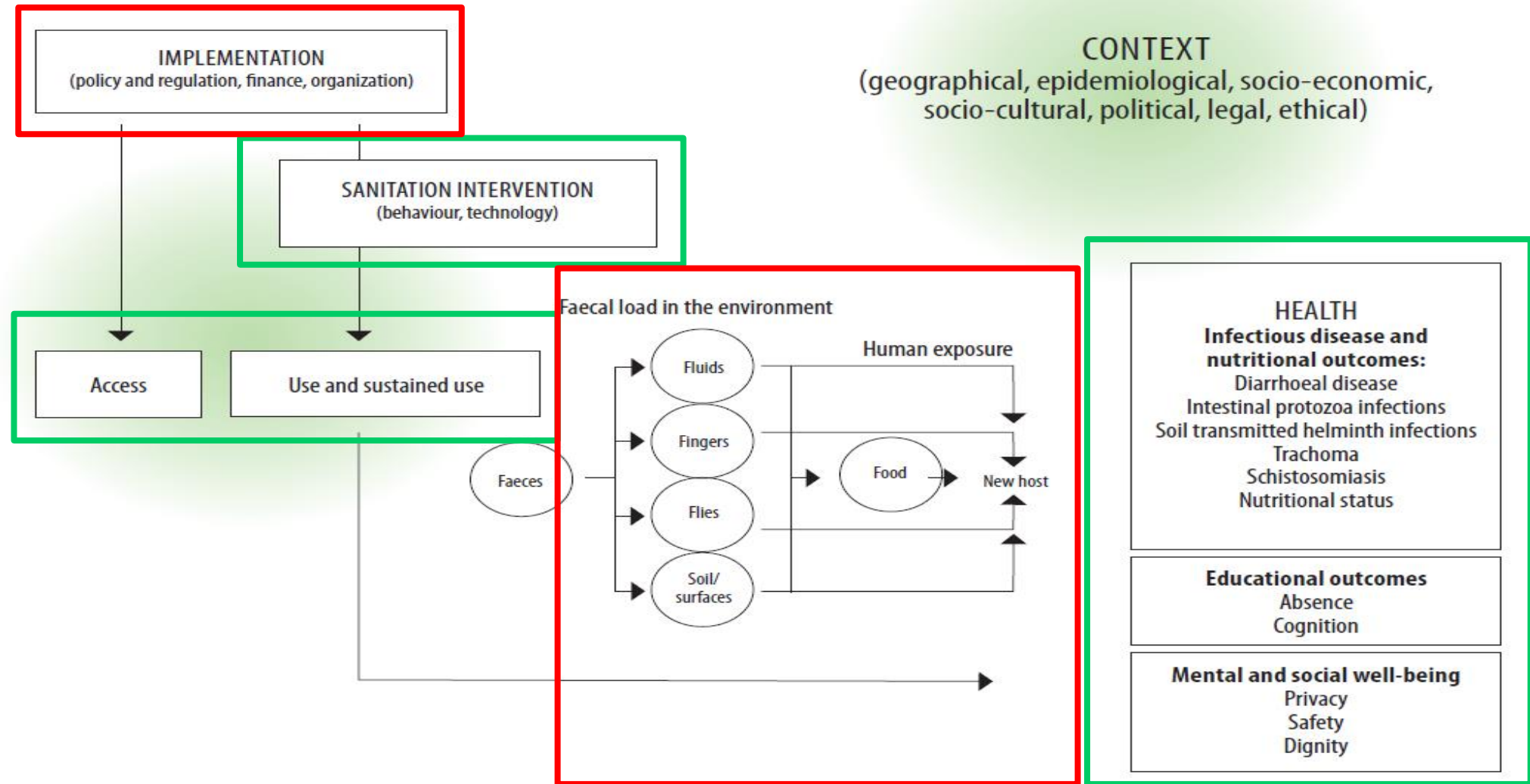


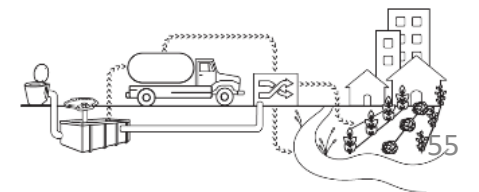
Figure 7.1 Conceptual framework for guidelines development



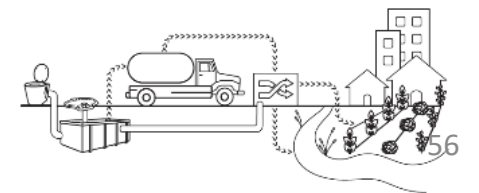
Chapter 9.

RESEARCH NEEDS

- Strategies for encouraging governments to prioritize, encourage and monitor
- Improving coverage and securing correct, consistent, sustained use
- Estimating health impacts from sanitation interventions
- Methods for assessing presence of and exposure to sanitation-related pathogens in the environment
- Leakage and fate of faecal pathogens in the environment
- Alternative designs and services
- Culturally-appropriate interventions respect human dignity and rights
- Mitigating occupational exposures
- Links between sanitation, animals and their impact on human health
- Ecological effects
- Sanitation and gender

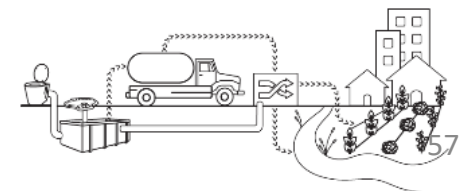


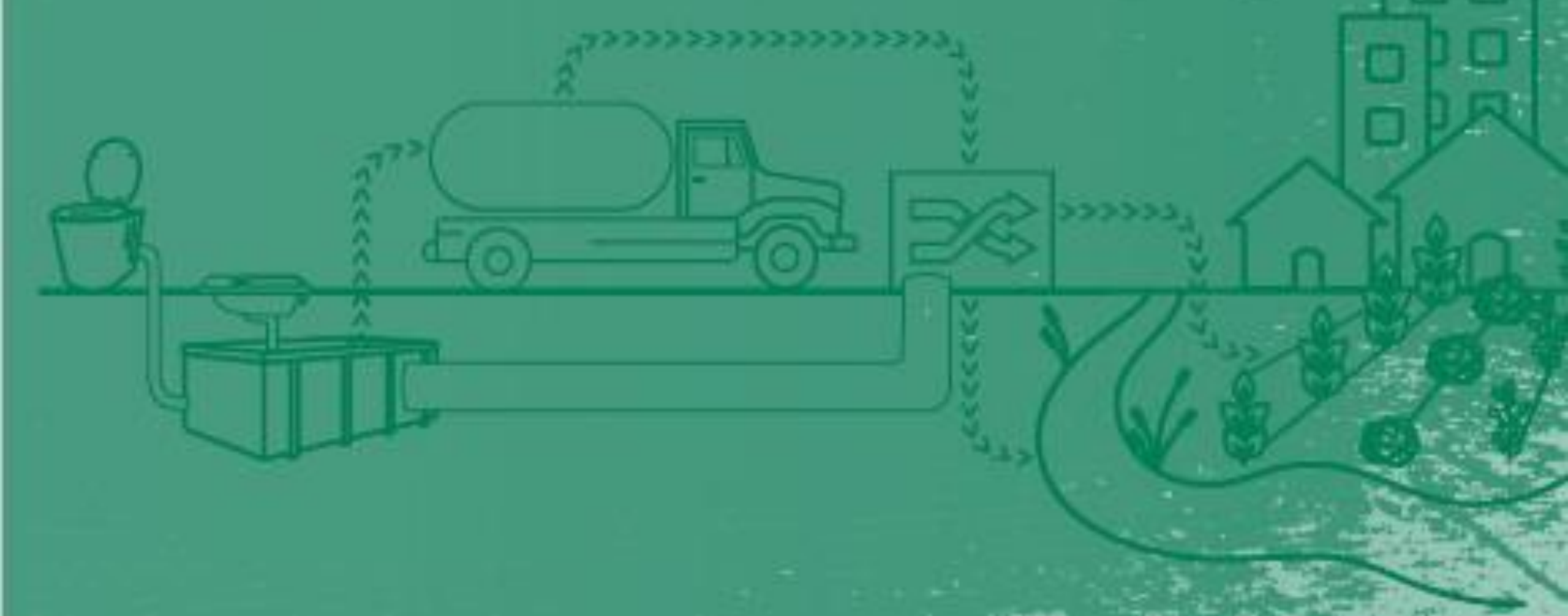
Discussion



NEXT STEPS

- **Help us spread the word** – on World Toilet Day and beyond via social media and using the guidelines with colleagues and national WASH platforms
- **Join the SuSanA Forum to learn more** - <https://www.susana.org/en/register>
- **Translations, printing and distribution** – all UN languages
- **Implementation with partners** - Country needs analysis to identify specific areas for implementation
- **Supporting materials** - More in-depth learning materials, and additional information on sub-topics





THANK YOU AND KEEP READING!

GUIDELINES ON SANITATION
AND HEALTH

