The background of the slide is a close-up, high-angle photograph of blue water with intricate, swirling ripples and textures. The colors range from deep navy blue to lighter, shimmering turquoise, creating a dynamic and textured visual field.

Update on the WHO recreational water quality guidelines (coastal & fresh waters)

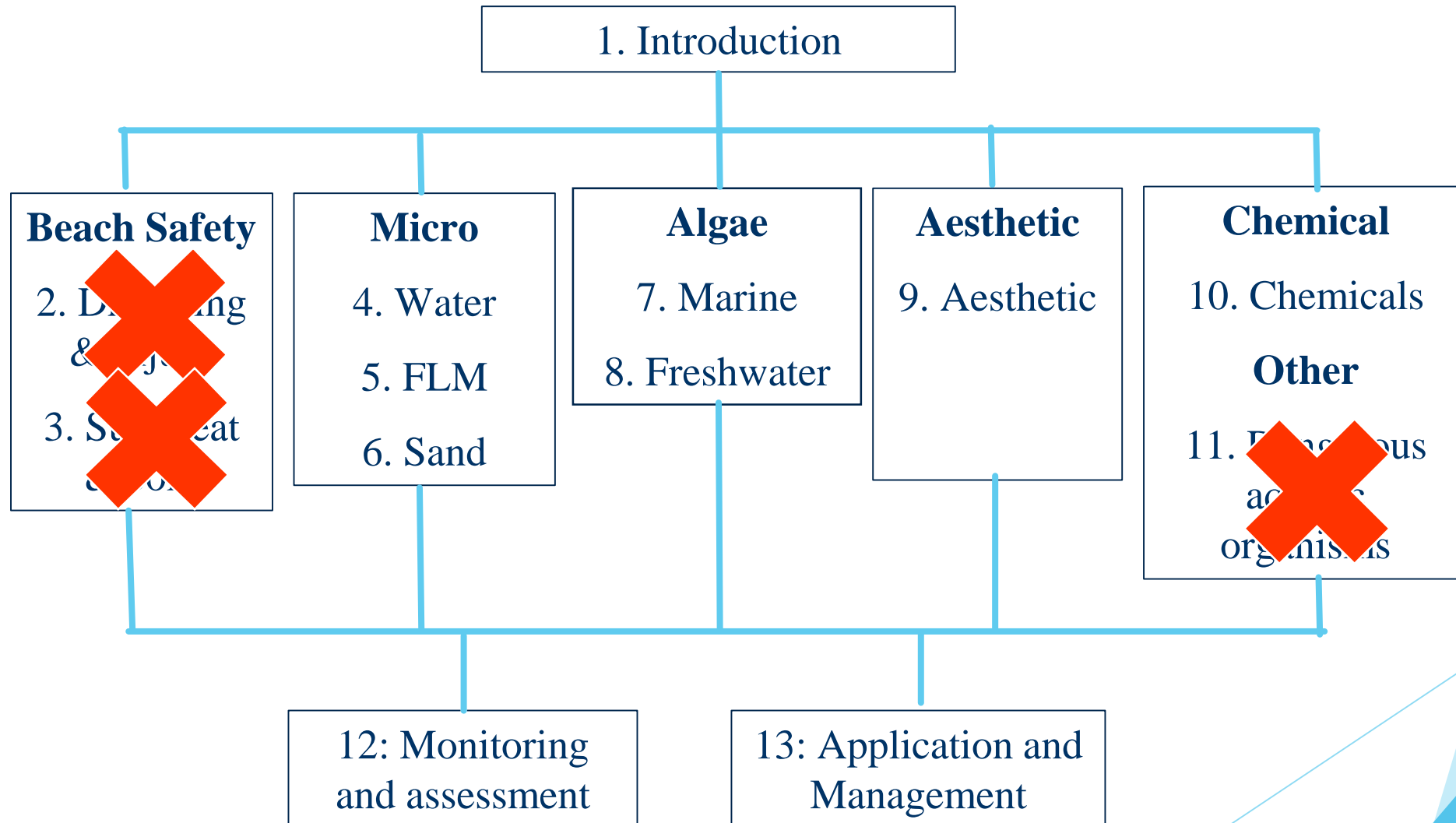
Dr Lorna Fewtrell

WHO Recreational water guidelines



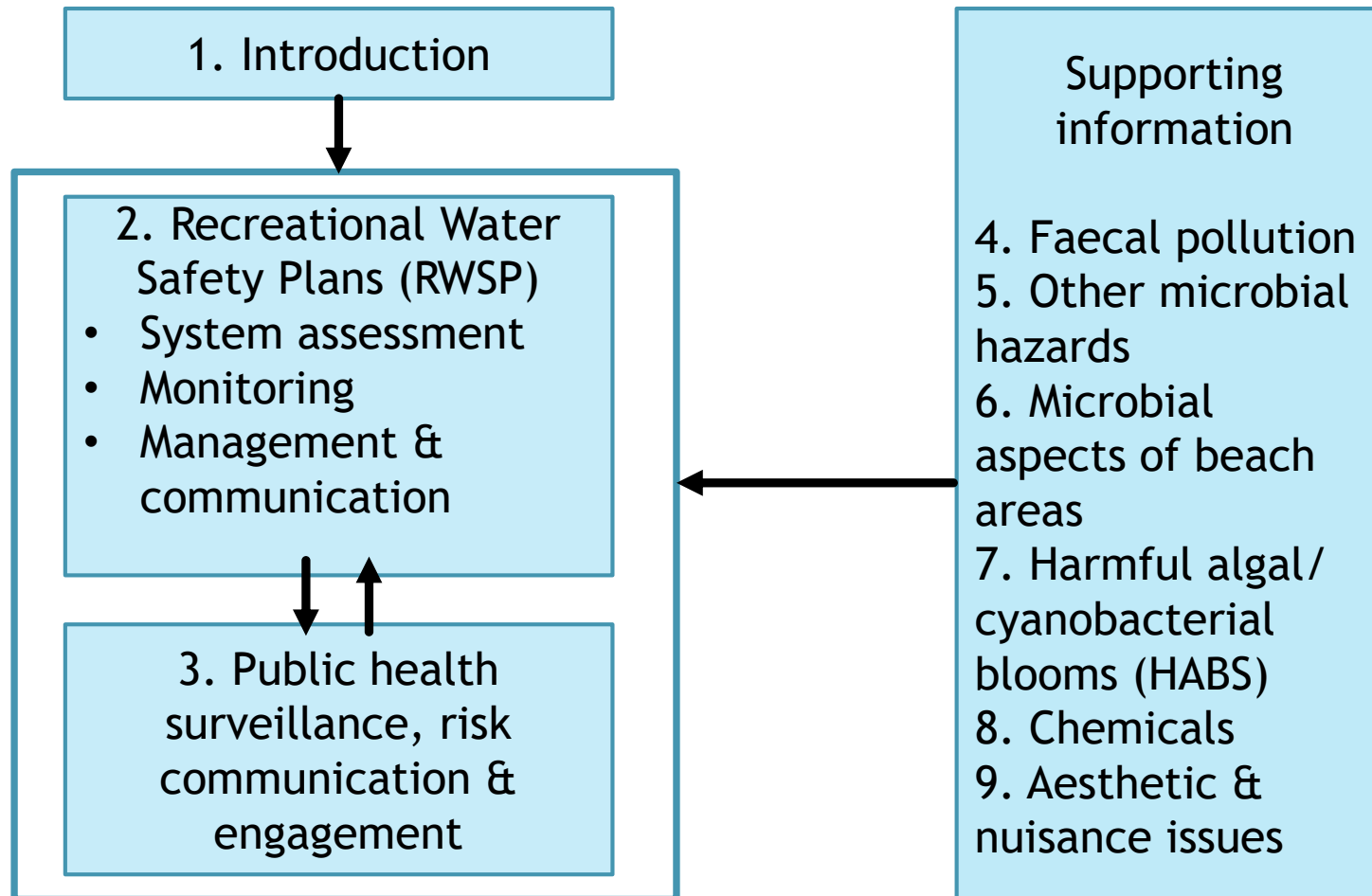
- ▶ 2 volumes
- ▶ Coastal & fresh waters (2003) - currently being updated, due for publication end 2020/early 2021
- ▶ Swimming pools & similar environments (2006)

Current structure - coastal & fresh



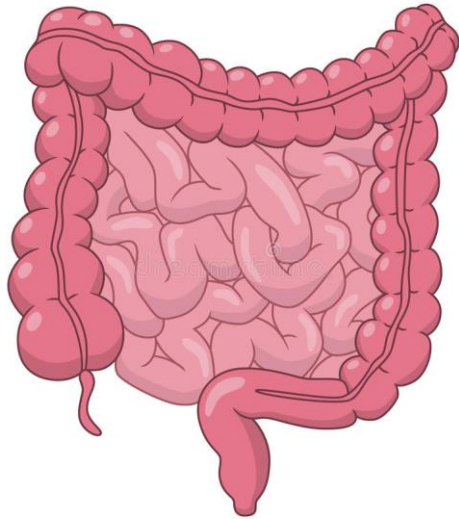
Guidelines for recreational water quality

- structure

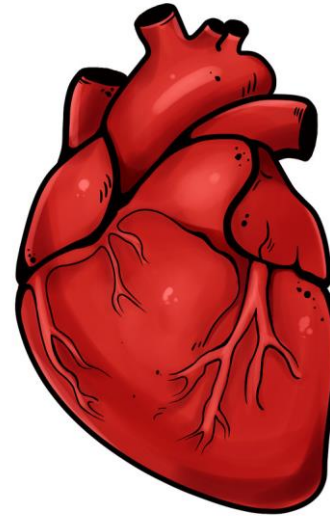


Shift in emphasis

- ▶ Old chapter 4 - faecal pollution and water quality



- ▶ New Chapter 2 - recreational water safety plans



Recreational water safety plans (RWSP)

- ▶ Water safety plans provide a practical and comprehensive approach to assess and manage risk associated with various uses of water including recreational activities
- ▶ Developed for ensuring safety of drinking water, first incorporated in WHO drinking water quality guidelines in 2004
- ▶ Idea was discussed in the first edition of the recreational water environments and expanded upon in the 2009 addendum

RWSP - the potential players

- ▶ Recreational water facility operators/service providers
- ▶ Health authorities (regional/local)
- ▶ Environmental protection agencies
- ▶ Local authorities
- ▶ Water and sewage companies
- ▶ Agricultural agencies
- ▶ Local tourism industry
- ▶ Local communities
- ▶ User groups
- ▶ Etc., etc., etc!

WSP - Three main components

- ▶ System assessment
 - ▶ Monitoring
 - ▶ Management & communications
-
- ▶ The supporting chapters are organized along these lines

System assessment - overall

- ▶ Analogous to risk characterization in the EU bathing water profile
 - ▶ Describe the recreational water environment
 - ▶ Identify hazards and hazardous events
 - ▶ Identify existing preventative measures and risks that are insufficiently controlled
 - ▶ Prioritize uncontrolled risks

Hazards & risks

- ▶ Effective risk management requires the identification of potential hazards & hazardous events and an assessment of the level of risk presented by each.
 - ▶ Hazard - a biological, chemical, physical or radiological agent that has the potential to cause harm
 - ▶ Hazardous event - an incident or situation that can lead to the presence of a hazard (what can happen and how)
 - ▶ Risk - the likelihood of identified hazards causing harm (in exposed populations in a specified time frame), including the magnitude of that harm &/or the consequences

System assessment - recreational water description

- ▶ Include all parts of the recreational water body and associated catchment
- ▶ Sanitary survey or inspection
- ▶ Include info on:
 - ▶ Physical environment
 - ▶ Climatic conditions
 - ▶ Recreational activities
 - ▶ Summary of any previous data

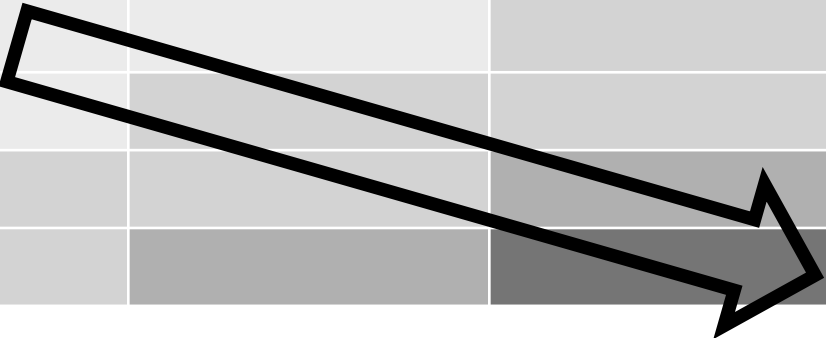
System assessment - hazards & hazardous events

- ▶ These shouldn't be limited to water quality issues, but could include drowning, injury and so on
- ▶ Examples
 - ▶ Sewage inputs (faecal pollution - Chapters 4 & 6)
 - ▶ Presence of avian schistosomes, waterfowl and the snail intermediate host (swimmer's itch - Chapter 5)
 - ▶ History of algal blooms (toxic cyanobacteria - Chapter 7)

System assessment - assess the risks

generic example

Likelihood	Severity or consequence			
	Insignificant	Minor	Moderate	Major
Rare	Low			
Unlikely				
Likely				
Almost certain				High

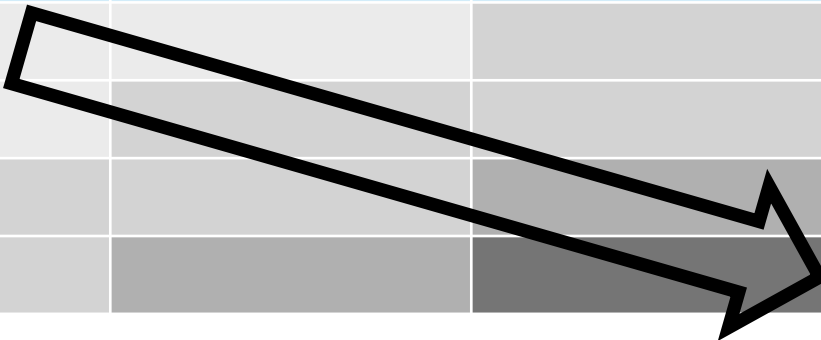


System assessment - risk assessment tools

- ▶ Water quality analysis (e.g. faecal indicator organisms, microbial source tracking, HABs biovolume)
- ▶ Quantitative microbial risk assessment
- ▶ Epidemiology
- ▶ Outbreak reports (e.g. leptospirosis, swimmer's itch)

System assessment - assess the risks faecal pollution example

Sanitary inspection (susceptibility to faecal contamination)	Microbial water quality (enterococci/100ml)			
	≤40	41-200	201-500	>500
Very low	Very good			
Low				
Moderate				
High				Very poor



System assessment - preventative measures

- ▶ For faecal pollution these could include
 - ▶ Sewage treatment
 - ▶ Minimisation of sewage overflows during storm events
 - ▶ Catchment controls to reduce impact of livestock on recreational water

Monitoring

- ▶ Three types:
 - ▶ Recreational water quality classification
 - ▶ Operational monitoring (to give timely warning of exceedances beyond normal conditions)
 - ▶ Verification (to determine that WSPs are functioning correctly to support the designated recreational activities)

Monitoring - recreational area classification

Sanitary inspection (susceptibility to faecal contamination)	Microbial water quality (enterococci/100ml)			
	≤40	41-200	201-500	>500
Very low	Very good			
Low				
Moderate				
High				Very poor

Monitoring - operational

- ▶ Not limited to water sampling and analysis, could include:
 - ▶ Visual inspection of potential sources of contamination
 - ▶ Flow/overflow gauges
 - ▶ Change in river heights
 - ▶ Rainfall
 - ▶ Wind speed & direction
 - ▶ Water temperature and dissolved oxygen

Management & communication

- ▶ ‘Upstream’ remediation
 - ▶ Improving sewage and CSO management
 - ▶ Working with agricultural agencies to reduce nutrient inputs to lakes
- ▶ Site management
 - ▶ Closure and warning (advisories)
 - ▶ Provision of facilities (e.g. litter bins)
 - ▶ Animal control (e.g. to scare off gulls, dog bans during bathing season)
- ▶ Education/awareness raising
 - ▶ Users (e.g. precautions against infection)
 - ▶ At risk groups
 - ▶ Medical profession (consider recreational water exposure)