

Contaminant Candidate List Workgroup

A person wearing a dark blue t-shirt and a grey baseball cap is kneeling in a field of tall green grass. They are holding a long, thin wooden pole horizontally. The pole has a grey, cylindrical sleeve or filter attached to its middle section. The person's hands are positioned near the sleeve, possibly adjusting it or preparing to use it. The background is filled with dense, green grass.

Drinking water microbiology: the state of knowledge



CCL 2 Workgroup - Drinking water microbiology: the state of knowledge

- **“...On the whole it seems that since a positive result is always open to serious doubt, and a negative result signifies nothing, the search for the typhoid bacillus itself, however desirable theoretically, cannot be regarded at present as generally profitable ...”
Prescott and Winslow (1904)**

Contaminant Candidate List

Workgroup: Limitations of indicator monitoring

Always present when source of pathogenic microorganism is present and absent in clean water

Present in numbers greater than the pathogens it is intended to indicate

Respond to natural or environmental conditions and water in a similar way than the pathogen

Easy to isolate, identify and enumerate.



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Workgroup: Limitations of indicator monitoring

In 3 outbreaks of cryptosporidiosis the water supplies reported;

<1.0 NTU turbidity

**< 1CFU/100 ml
Total Coliform (TC)**



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Workgroup: Limitations of indicator monitoring

Opportunistic pathogens





CCL Workgroup: Pathogens in the environment

- 10 = 1,000 (Indicator counts in water distribution systems often occur with means of 10^{-5} and standard deviations of 10^7)
- Coefficient Variance of 0.3 are considered good for microbiological counting techniques



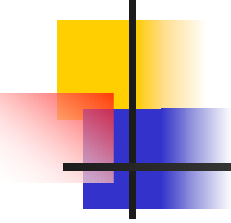
CCL Workgroup: identifying emerging pathogens before they cause disease

- Need to recognize the disease
- Need to associate an organism with the disease
- Research and surveillance are directed towards known pathogens



CCL Workgroup: Methodology limitations

- No standard surveillance system; no real estimate of incidence of illness
- Analytical methods differ in accuracy and precision and might be different: diagnostic techniques include cultural, molecular and microscopic
- Laboratories are more likely to analyze for some microbial pathogen than others
- No easy system to exchange information and reporting
- Limitations in technology



CCL Workgroup: Limitations of indicator monitoring (summary)

- Uncertainty is measured by orders of magnitude in microbiology
- Variability is manifested by wide differences in infectivity of pathogen strains and host susceptibilities
- Conventional method cannot predict emergence of new pathogens
- Methodology limitations impede progress