



Figure 2-4 Median dose of organisms required in drinking water to cause infection (Source: Crittenden et al., 2005).

## 2.7 TREATMENT EFFICIENCY

Water treatment processes that are focused on the removal of particulates, such as coagulation/ filtration and membranes are generally effective at removing pathogens. Coliform removal rates of 97 to 99.5% can be expected in a properly operated treatment plants (Viessman and Hammer, 1993) with prior chemical pretreatment. Organisms that are motile, such as protozoa, may be more resistant to removal by these mechanisms.

Disinfection of bacteria pathogens can be achieved effectively through either chemical oxidation using chlorine or ozone, or through exposure to ultraviolet light (Table 2-4). Viruses can also be removed effectively through chlorine or ozone oxidation. The treatment of protozoans is more challenging, as cysts and oocysts of protozoans cannot be fully removed by sand filtration and are resistant to chemical disinfection. *Giardia*, was found to be resistant to chlorine disinfection. *Cryptosporidium* is even more resistant to chlorine than *Giardia*. However, disinfection using ultraviolet light was found to be effective in inactivating *Giardia* (Stolarik et al. 2001) and *Cryptosporidium* (Craik et al., 2001).