

# Health aspects of rainwater based recreational water

**DWRP**

**29. Jan 2010**









COWI



COWI

# Roofs



# Squares and yards



# Streets



## Compounds in surface run-off water

Heavy metals(**Pb, Cu, Cr, Zn, Cd**,etc.)

Environmental toxics(**PAH**, DEPH, Glyphosat, Bisphenol, etc..)

Hygienic parameters and pathogens(E.coli, Campylobakter, Salmonella, **Cryptosporidium**, etc.)

# Transmission of micro organisms and toxic compounds to humans

Transmission:

- Mouth (oral)
- Skin contact
- Inhaling (aerosoles)

## Oral intake

Playing with water: 0,1-2 ml/day, av. 1 ml/day

Wading in water: 1-100 ml/day, av. 10 ml/day

Swimming: 100 ml/swim event

# Playing with water







# Swimming



**schlijper.nl**  
today

# Cryptosporidium

<b>Animals</b>	<b>Excrete Cryptosporid. parvum</b>	<b>Run-off surface water</b>
Birds	None	Roof water
Rodents	Possible	Square water
Pets	Very seldom	Square water
Husbandry (cattle, sheep, pigs)	Frequent	Not relevant for urban area

# Campylobacter

Extremely seldom documented in roof water. Also applies to Salmonella

Not found in roof water tested for Vestbadet (public swimming pool)

For the last 25 years not reported as causing disease in CDC's surveillance

Savill (New Zealand) detected Campylobacter at 0.56 MPN/100 ml

Infective dose at level 500 units

Australian cohort study (sample > 1000 4-6 year old) showed no difference between drinking untreated roof water and public supplied drinking water

## Risk of infection

Extremely seldom from roof water

More relevant to test and estimate for square water

# Risk modelling

# Chemical risks

Lead

Copper

Cadmium

PAH

# Regulation of water quality

Bekendtgørelse 1449 af 11/12 2007 om vandkvalitet og tilsyn med vandforsyningsanlæg

Bekendtgørelse 1669 af 14/12 2006 om miljøkvalitetskrav for vandområder og krav til udledning af forurenende stoffer til vandløb, søer eller havet

Bekendtgørelse 165 af 23/02/2009 om badevand og badeområder

Bekendtgørelse 288 af 14/04/2005 om svømmebassiner mv. og disses vandkvalitet

Sundhedsstyrelsen 09/07 2009 Anbefaling for midlertidige udendørs bade- og soppebassiner, pjaskevand, mv. om sommeren i dagtilbud

# Udkast til Bekendtgørelse om svømmebadsanlæg m.v. og disses vandkvalitet

§ 5. Svømmebadsanlæg med brug af overfladevand skal mindst opfylde følgende krav :

bassinbunden skal tydeligt kunne ses overalt, ingen desinfektion

indtagningsvandet skal overholde de skærpede krav i bekendtgørelse om badevand og badeområder:

- Intest. Enterococci 200CFU/100 ml
- E.coli 500 CFU/100 ml

## **Bassincirkulation ifht. badebelastningen for nye svømmebadsanlæg og renoverede anlæg**

Bassintemperatur

<29 <sup>0</sup> C	2,0 m <sup>3</sup> /time/person
29- 33 <sup>0</sup> C	2,5 m <sup>3</sup> /time/person
≥34 <sup>0</sup> C	3,0 m <sup>3</sup> /time/person

## Treatment of run-off

Parameter	Unit	Total	After sedimentation
SS	mg/l	180	15
Lead	µg/l	18	5.1
Copper	µg/l	58	21
Zink	µg/l	140	56
Total hydrocarbons	µg/l	720	180

