

Environmental Health Monitoring System in Shanghai

Shanghai Municipal Center for Disease Control & Prevention
Department of Environmental Health and Safety

Monitoring objects

- Drinking water
- Indoor air
- Soil
- Human biological sample

Goals:

- To measure the external exposure level
- To determine the internal exposure level
- To detect the early health effects

I. Drinking water

History:

- first water plant was established in 1880s
- 1960~1970, Shanghai Municipal Government has begun to improve water supply system
- most of water supply networks still work

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- in 1980s, with the development of industrialization
 - the quantity of water sewage increased greatly
 - at that time the daily average water sewage was 5 million tons
 - nearly 3 million tons were discharged into watercourse directly without any treatment

Present status:

- 280 water plants, for 18 millions people
- 15 water plants, for 10 million people in downtown
- two source water plants, located in the down stream of Yangtze River and up stream of Huangpu River respectively, supply water with better quality to 14 water plants in downtown

No.	Water plant name	Daily drinking water supply (ten thousand tons/day)	served people (ten thousand people)
1	Minhang No.2 water plant	52~53	60
2	Zhabei water plant	20~25	80
3	Linjiang water plant	30	80
4	Yuepu water plant	25~30	30
5	Taihe water plant	18~20	100
6	Nanshi water plant	50	80
7	Changqiao water plant	120	220
8	Wusong water plant	17	20
9	Yangshupu water plant	110~120	200
10	Pudong water plant	8	20
11	Jujiaqiao water plant	10	20
12	Yangsi water plant	22	40
13	Zhuojiadu water plant	0.5	2
14	Lingqiao water plant	33	50
15	Dachang water plant	35	Combined with Taihe



Responsibility:

- Shanghai Municipal CDC is responsible for 15 water plants in downtown
- District or County CDC is responsible for all water plants in their area
- Shanghai Municipal CDC is also responsible for setting down monitoring project annually

Monitoring objects:

- source water
- treated water
- end pipe water
- tank water

Monitoring items:

- **For source water**

water temperature, pH, COD(chemical oxygen demand), dissolved oxygen, arsenic, phenol, cyanide, chrome, mercury, nitrate and so on

nearly 30 items in total

- **For treated water**

besides monitoring source water items,
additional items include free residual
chlorine, chloroform and carbon
tetrachloride

- **For end pipe water**

free residual chlorine, total number of bacteria, coliform, color, turbidity, odor, iron, lead, manganese, chloroform, carbon tetrachloride and COD

- **For tank water**

similar with end pipe water

Monitoring frequency:

- source water and treated water: once in two months
- end pipe water and tank water: once a month

Characteristic:

- a dynamic process
- monitoring items adjusted annually
- covering the whole city roughly
- divided into two stages
from 1970s to 2002 and from 2002 up to
now

.Indoor air

Routine monitoring contents:

- public places
such as hotel,entertainment place,barber shop,
gymnasium,swimming place, museum, library,
gallery,shopping center,hospital waiting room
and so on
- 28 types in total

Responsibility:

- Shanghai Municipal CDC is responsible for big projects
- District or County CDC is responsible for all kinds of public places in their area

Monitoring items in indoor air:

- in accordance with relative standards
- in general, include temperature, humidity, indoor wind speed, carbon monoxide(CO), carbon dioxide(CO₂), formaldehyde, noise, bacterium, inhalable particulate matter, and fresh air

Monitoring frequency:

- Covering all kinds of public places(mentioned above) in whole city roughly
- Once a year

Other monitoring projects:

1. indoor air pollution in newly decorated apartments in Shanghai

- sponsored by China CDC in 2003
- 8 districts in Shanghai
- about 150 newly decorated apartments
- 5 items:
formaldehyde, benzene, toluene,
dimethylbenzene and TVOC

2. Microbe pollution in air condition system

- sponsored by International Copper Association(ICA) in 2003
- Zhabei district and Minhang district
- 63 air condition systems in hospital, office building, hotel and shopping center
- 7 items:
bacterium, mildew, legionella pneumophila, staphylococcus aureus, streptococcus hemolyticus, bacillus and dust mite

Results:

- pollution of bacterium and mildew are serious
- legionella pneumophila, staphylococcus aureus and bacillus are detected
- streptococcus hemolyticus and dust mite are undetected

.Soil

A case study:

A dwelling house built on the site where there was a tuberculosis hospital before

Monitoring items:

- Heavy metal:
mercury, chrome, cadmium, arsenic and lead
- Microbes:
coliform bacteria and tubercle bacillus(T.B.)

. Human biological sample

organic chlorine concentration monitoring
in the mother's milk

- in 2003
- 5 districts and counties
- 372 samples
- monitoring items:
benzene hexachloride(BHC) and dichloro-
diphenyl-trichloroethane(DDT)

result:

- the accumulative levels of BHC and DDT had declined since 1983 BHC and DDT were prohibited
- however, the accumulative levels of BHC and DDT in 2002 were still higher than other countries

Some conceiving

- Based on the present monitoring system of drinking water, add some new items, for example, the number of algae, MCLR, MX and cryptosporidium
- Set up monitoring system of air pollutants in the residential areas near to the main air pollution sources in Shanghai

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- Set up the monitoring system of biomarkers in Shanghai residents, to meet the requirement of epidemiologic studies on environment-related diseases, e.g. COPD and asthma
 - Monitoring the pollution status of dioxins in fly ash, soil and milk powder

Thank you!

