



# Methodology for Comprehensive Monitoring of the Environment and Public Health as an Important Evidence of Safe Nuclear Engineering Development



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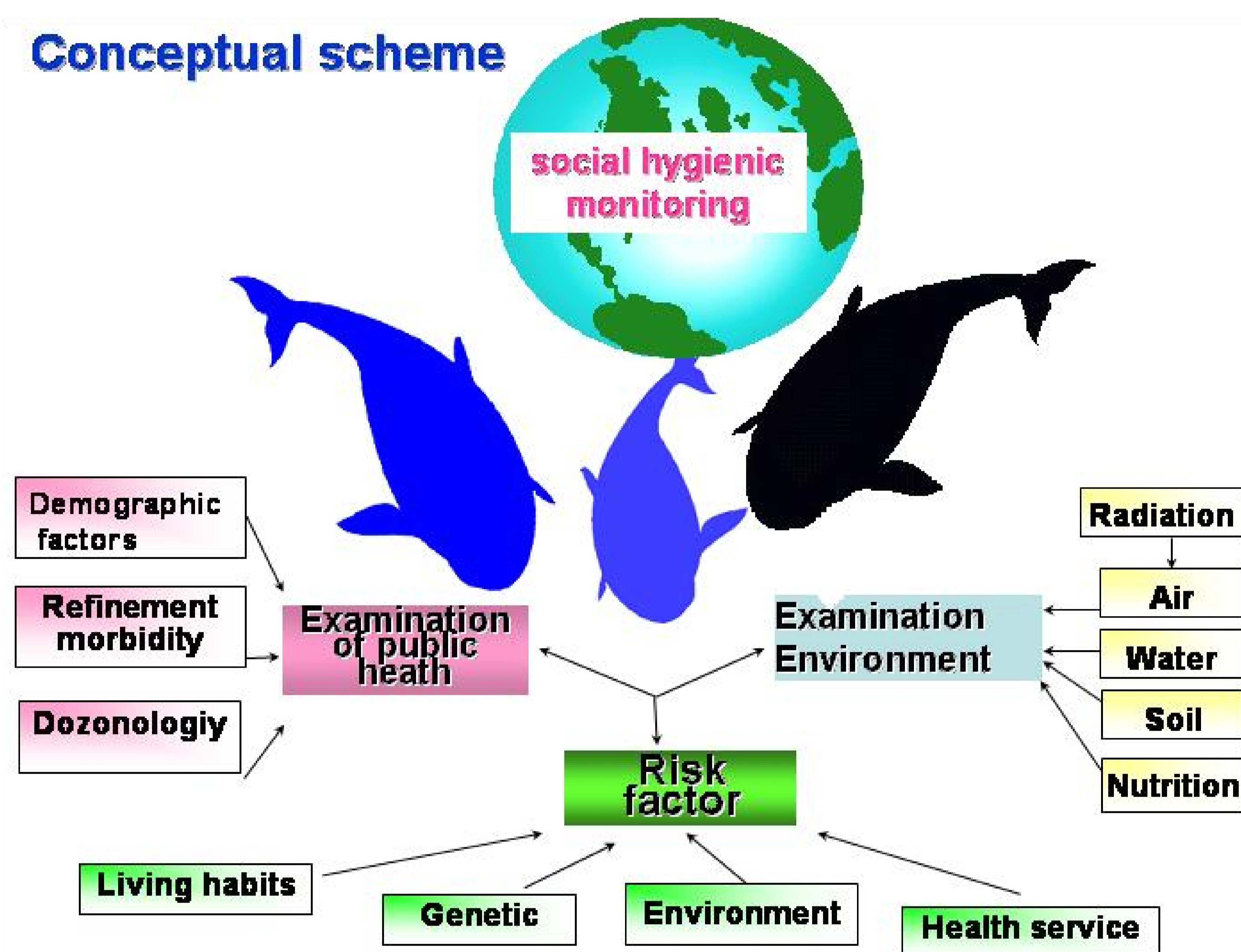
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The need to assure the safe nuclear engineering development for the national public is an urgent requirement of time. In the light of the renaissance of the Russian nuclear energetic complex, the special comprehensive monitoring is relevant in the **NPP areas**

**Comprehensive monitoring in the NPP vicinity** is the system of state surveillance, analysis, assessment, and prognosis of the population health and habituated environment as well as the correlation of the population health versus the habituated environment factor exposure



## Conceptual scheme



## Method

The comprehensive monitoring includes both  
■ radiation monitoring of the environment  
■ public health

In order to evaluate the **environmental radioactivity** the specialized rules are elaborated, which include the types of environmental media, scope and periodicity of sampling, methodological and technical requirements

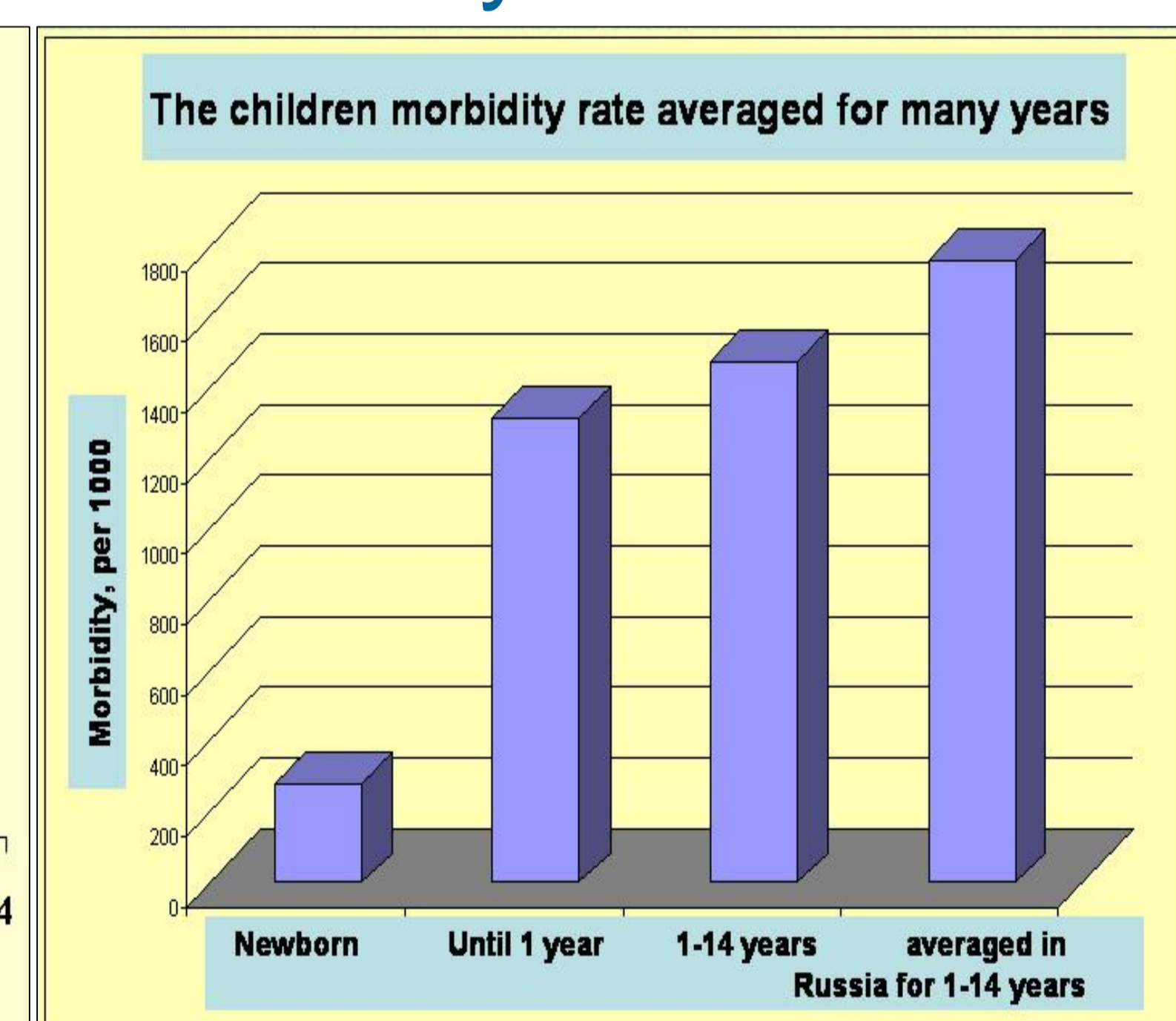
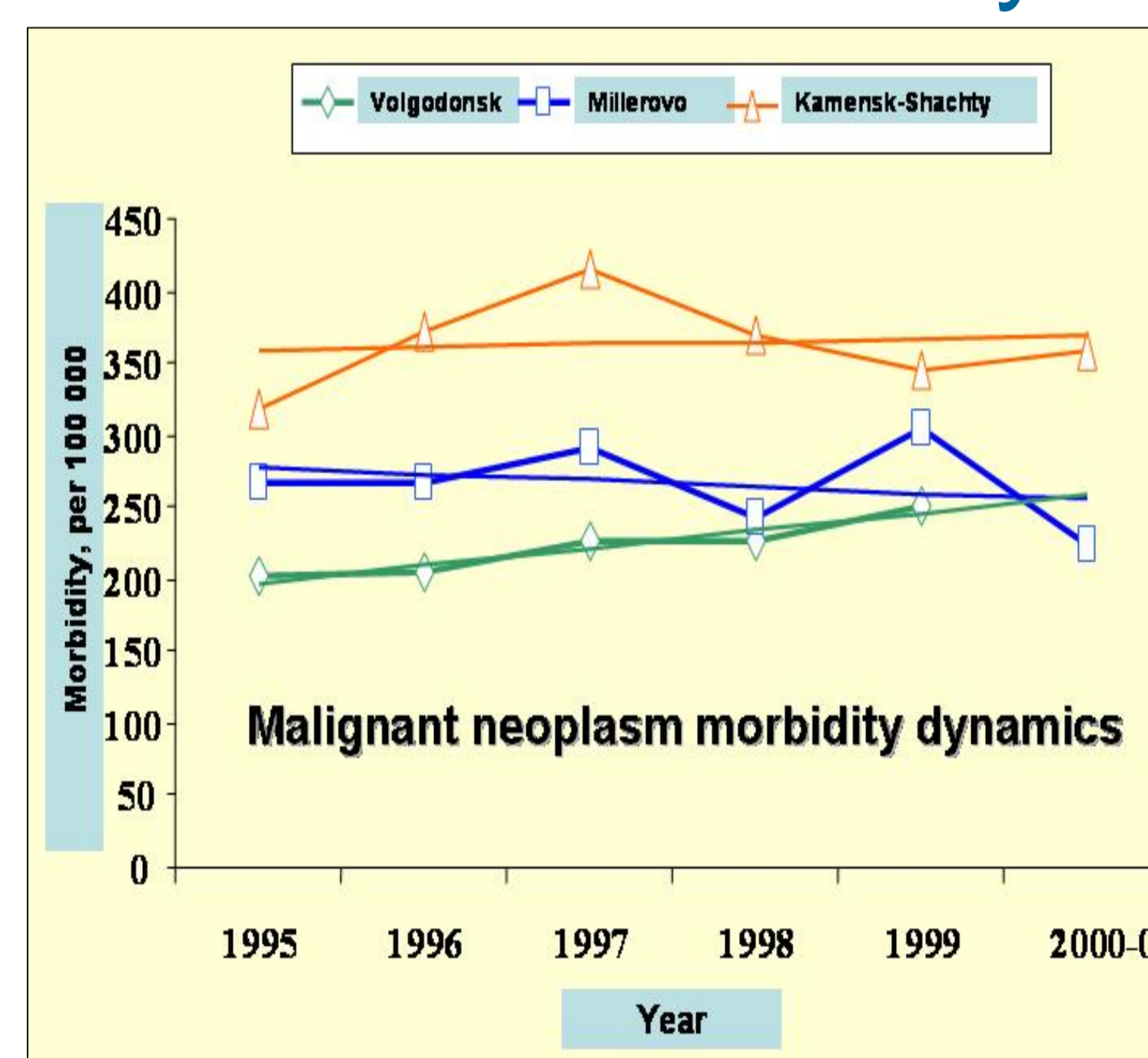
Two approaches are used for **population health** assessment: epidemiological and cohort clinical approach

## Environmental radiation situation in NPP surveillance area

- background dose rate of gamma radiation – from 0.08 till 0.15  $\mu\text{Zv h}^{-1}$
- specific activity of  $^{90}\text{Sr}$  in water of open basins varies from 0.005 up to 0.04 Bq/l,  $^{137}\text{Cs}$  – from 0.002 up to 0.02 Bq/l
- $^{90}\text{Sr}$  and  $^{137}\text{Cs}$  in drinking water is less than 0.03–0.04 Bq/l, that is much less than intervention level
- $^{90}\text{Sr}$  and  $^{137}\text{Cs}$  in foodstuffs is in 100-1000 times lower in comparison with permissible levels
- $^{90}\text{Sr}$  and  $^{137}\text{Cs}$  in foodstuffs and drinking water is same, as well as in similar foodstuffs received from other regions of Russia

## Monitoring of the public health

- Demography characteristics (birth rate, malignant mortality, childhood mortality)
- Morbidity (dissemination, structure of major diseases)
- Reproductive health
- Leukemia and thyroid morbidity



## Comments and Conclusions

The transparency and validity of the provided information is an important condition in the course of the comprehensive monitoring

The selected approaches and criteria help to control changing dynamics, i.e., to conduct monitoring since the beginning of the entire NPP operation cycle and at the stage of new units launch

The proposed methodology and findings of the comprehensive monitoring have extensively been tested during the public hearings among the population living in the areas of the existing and constructed Russian NPPs.