

# Population Screening

**Population screening** is a type of prevention test for the hereditary diseases. It tries to find out the healthy people, who are going to become ill. We usually look for some proteins or genes, which are connected to some disorder. It is very useful tool for searching for hereditary metabolic diseases and cancer families.

This type of screening is focused on the whole population. The result can't be connected directly with the diagnosis. Screening is not reliable enough. The **follow-on test** are then needed. We should examine just smaller groups at risk, which we have found in the population. Some of them can be false positive and we have to find it out.

## The Criteria of Population Screening

1. Screening diseases have to be **quite frequent**
2. Test have to be **as save as possible**
3. The way of **getting the samples** has to be **easy and quick**
4. The tests have to be **low-cost**
5. We test only **diseases, which we can cure**
6. The results have to have **high from weed**

## Type of the Samples

The most common samples, which are used for the population screening are **blood** samples. Nowadays we are able to also use the **buccal** samples. It is necessary to get the samples in the easiest, least invasive and quick manner. It is the only way on how to examine the huge number of people. E.g. not everybody will agree with muscle biopsy.

## The Advantages of Screening

- **Prevention** - it saves treatment costs (e.g. to substitute some proteins or enzymes). People at risk can change their lifestyle to prevent the disease.
- **Find the carriers of the hereditary disease before the first symptoms** - the earlier you discover the disease the more effective the treatment is (*sclerosis multiplex, AML - amyotrophic lateral sclerosis*)
- **Newborn blood spot test** - looking for serious metabolic diseases in newborns (e.g. phenylketonuria)

## The Disadvantages of Screening

- **False positive test** - people, who are not ill at all, but test positive. Might receive treatment which they do not need. This can be harmful for their physical and mental state. The sensitivity and specificity have to be high.
- **Persuasion of the healthy people** - the population screening is based on the examination of the **healthy people**, who don't have any symptoms, so sometimes it is very hard to explain them the importance of the screening.

## Population Screening Programs

1. **Czech Republic**: cancer – breast cancer, colorectal cancer, cervical cancer, prostate cancer (*it is not paid by insurance!*), neonatal screening – 13 diseases, including phenylketonuria, cystic fibrosis, congenital adrenal hyperplasia, congenital hypothyroidism nad 9 inherited metabolic disorders.
2. **USA** (*depends on the individual states*): cancer – colorectal cancer, prostate cancer, breast cancer, metabolic diseases – cystic fibrosis

## Links

## Related articles

- PCR
- Cancer Families
- Breast cancer
- Colorectal cancer
- Cervical cancer
- Cystic fibrosis
- Phenylketonuria

## **External links**

- Risks and Benefits (<http://www.genomesunzipped.org/2010/07/risks-and-benefits-of-population-screening.php>)
- UK Screening Portal (<http://www.screening.nhs.uk/>)