# INTRODUCTION

**What can we learn from existing screening programs?**

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Region Gotland

# Why screening?

- Cancer is a lethal disease
- Early detection increases the chance of cure and can decrease too early death
- Population based, organised screening is a strategy in order to reduce cancer mortality

# Magnitude of the problem

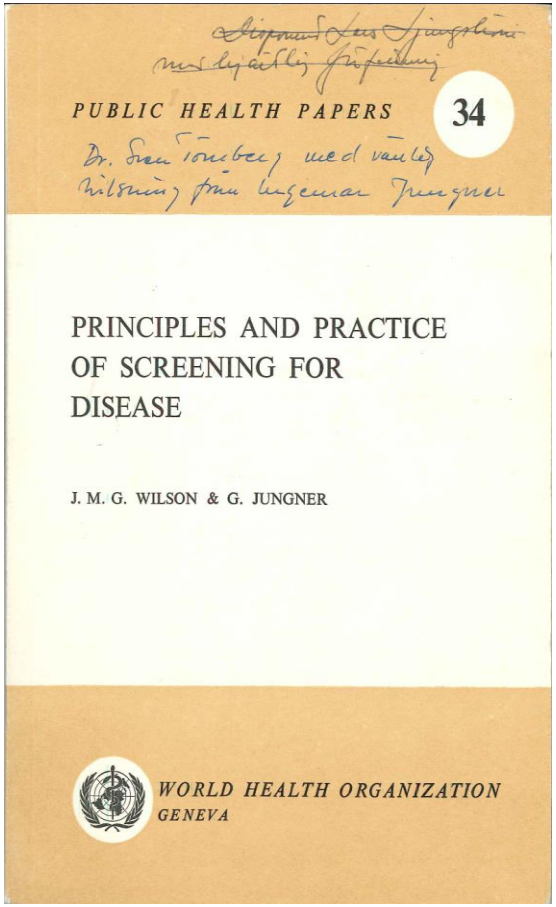
| | INCIDENCE | | MORTALITY | | |
|---|---|---|---|---|---|
| | Men | Women | Men | Women | Total |
| Breast* | 61 | 9 730 | 6 | 1 398 | 1 404 |
| Colorectal* | 3 952 | 4 022 | 1 417 | 1 354 | 2 771 |
| CIS cervix (squam.)* | | 5 136 | | - | |
| Invasive cervix cancer* | | 549 | | 132 | 132 |
| Prostate** | 10 985 | | 2 398 | | **2 398** |
| Lung** | 1 970 | 2 069 | 1 805 | 1 845 | **3 650** |
| Ovarian** | | 700 | | 562 | **562** |
| Malignant melanoma** | 1 855 | 1 813 | 292 | 214 | 506 |
| Pancreas** | 617 | 634 | 863 | 929 | 1 792 |

* = screening established
** = screening discussed

***Cancer Incidence and mortality in Sweden 2014***
*Socialstyrelsen, 2015*

# WHO screening criteria from 1968

- Common disease, serious health problem
- Preclinical phase
- Test to find preclinical disease
- Treatment
- Accepted by target group
- Cost effective

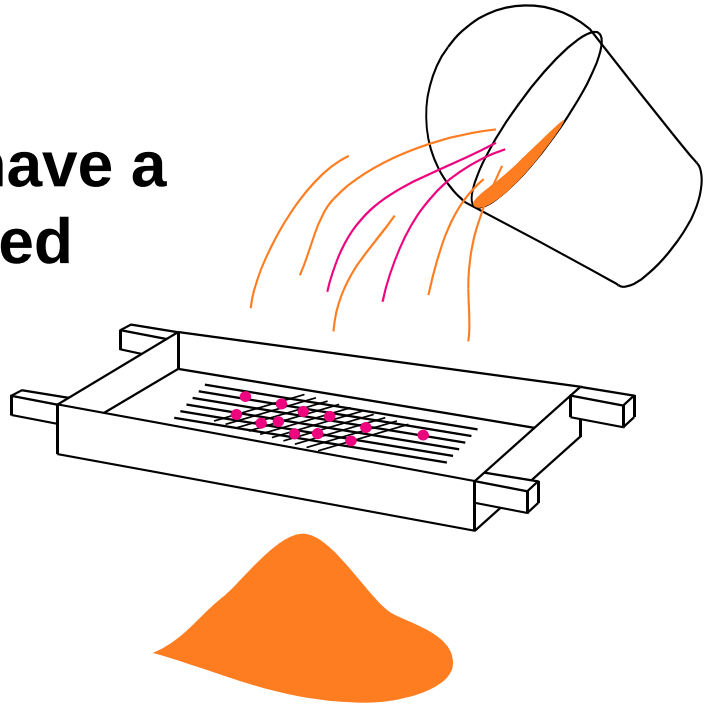


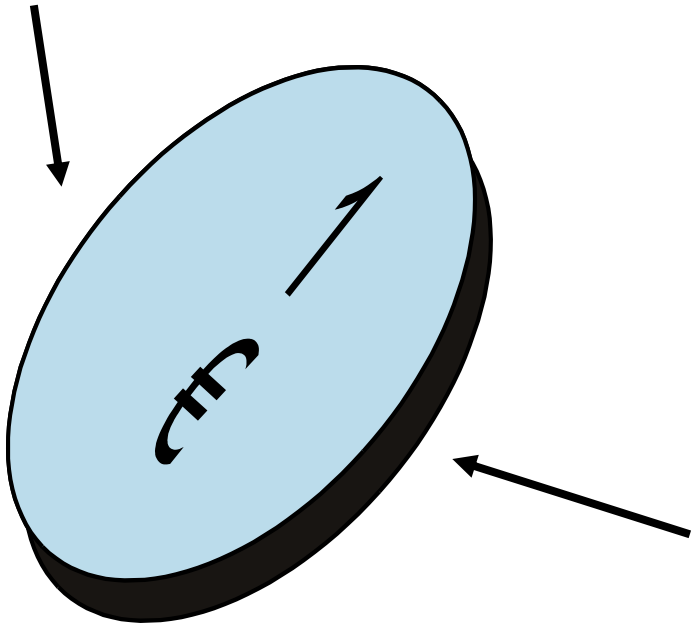
# Different approaches to early detection

- Organised and population based screening
  - for invasive disease, e.g., breast cancer
  - for precursor lesions, e.g., cervix cancer
  - once in a life-time (colonoscopy screening for CRC)
  - regular intervals (BC, cervix, FOBT-screening)
- Screening for risk (inherited cancers, risk behaviour)
- Screening of high risk group, e.g., lung cancer screening
- Opportunistic testing
- *Clinical early detection (early symptoms)*
  - *Patient's delay*
  - *Doctor's delay*
  - *Organisational delay*

# Screening contra Health check-up

**A *medical service* in order to satisfy an individual's wish to have a health check-up, or to be ensured of not coming too late or….**





**….an *active screening* of a defined population in order to find a cancer in a curable phase**

# Who will benefit from screening?

**Do not benefit**

- Screen detected cancers who would have survived irrespective of screening
- Screen detected cancers who will die of the disease
- Screen detected cancers who would never be clinically diagnosed in absence of screening (*over diagnosis*)
- False positives
- False negatives

**Do benefit**

- Cases who would have died if they had not been diagnosed through screening. <u>These individuals will never know!</u>
- *(The true negatives will "feel" they benefit – but that is not the purpose of screening)*

# BIASES

- ***Self selection bias***: Individuals with higher health awareness and lower risk for disease are more likely to participate in screening. Makes it difficult to reach high risk groups, and might lead to lower effect.
- ***Lead time bias***: Seemingly prolonged survival
- ***Length bias sampling***: Easier to detect slow growing, low risk, non-lethal tumours.

……How can we know that screening works?

## Level of evidence

I: several RCTs
II: one RCT
III: prospective cohort studies
IV: retrospective case-controls studies
V: case series; studies without control group
VI: expert opinion

## Grading for strength of recommendations

A. intervention strongly recommended
B. intervention recommended
C. intervention to be considered but with uncertainty about its impact
D. intervention not recommended
E. intervention strongly not recommended

# How long is a screening process?

- Optimally it includes assessment and primary treatment of individuals with abnormal findings
- Depends on health care organisation
- Depends on the wording in the invitation letter "*Screening improves the chance of finding a cancer in a curable stage*". The screened individuals need to know
  - *If it was a cancer*
  - *If the cancer was diagnosed in an early stage*

## Who is responsible for a screening program?

- For the recommendations?
- For the quality?
- For the results?
- For the budget?