



# Consequences of Overdiagnosis

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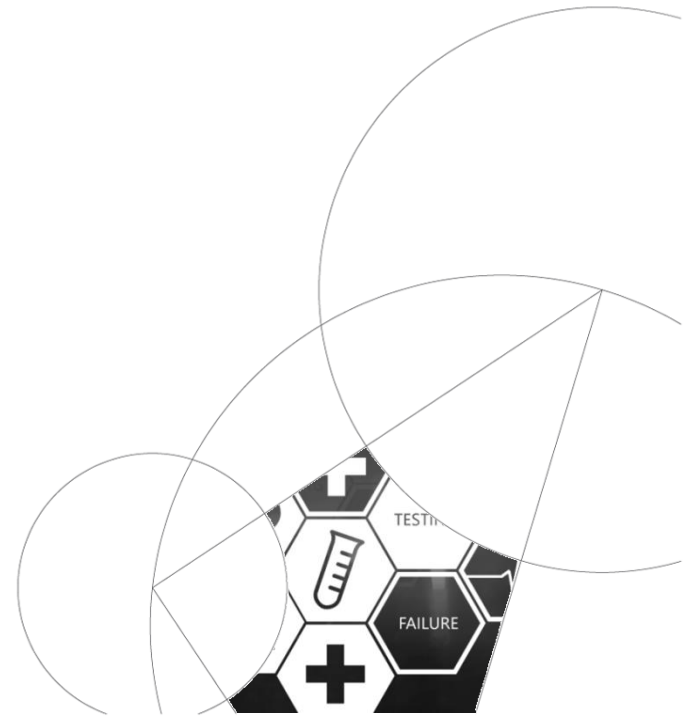
Prof. Russell P. Harris, MD

University North Carolina General Medicine



## Objective

# What are the consequences of overdiagnosis?



## Methods

### Taxonomy of consequences

Russell P. Harris et al.

The harms of screening: a proposed taxonomy and application to lung cancer.

JAMA Intern Med. 2013;174(2):281-5

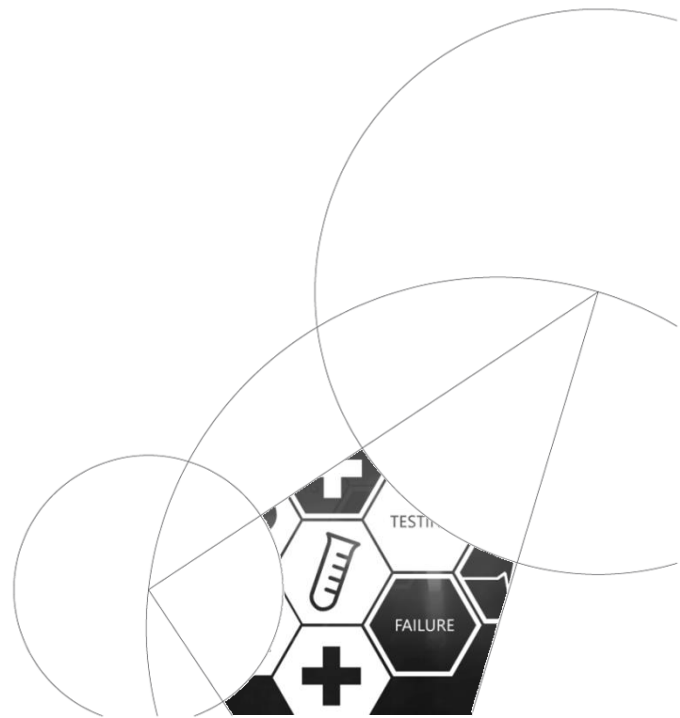
### Systematic literature search

PubMed

Web of Science

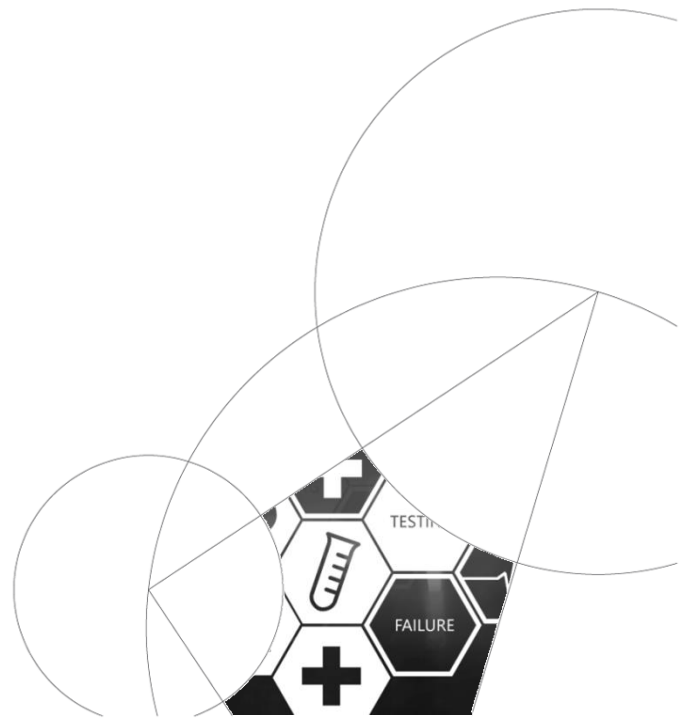
Citation tracking

Information specialists from The Royal Library, CPH



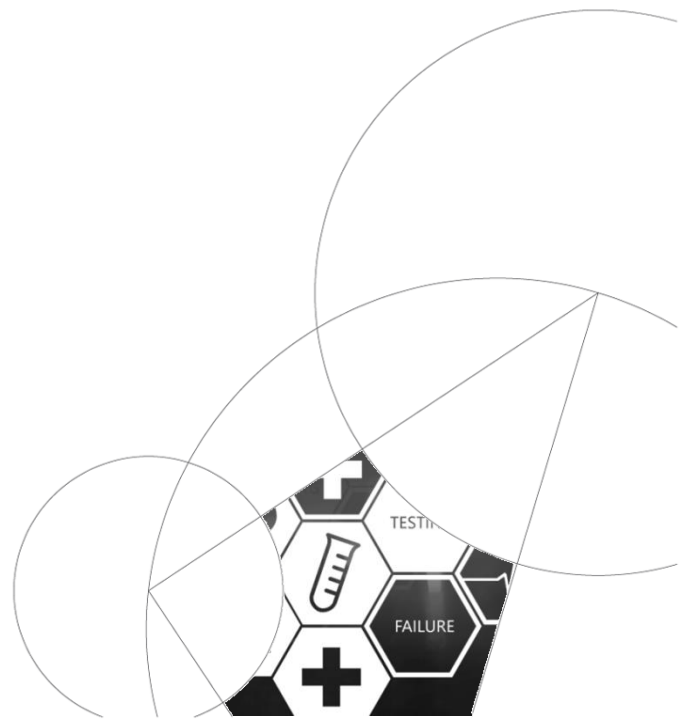
## Results

1. Financial strain
2. Medical costs
3. Opportunity costs
4. Hassles/inconveniences
5. Physical harms
6. Psychological harms
7. Work-related costs
8. Societal costs



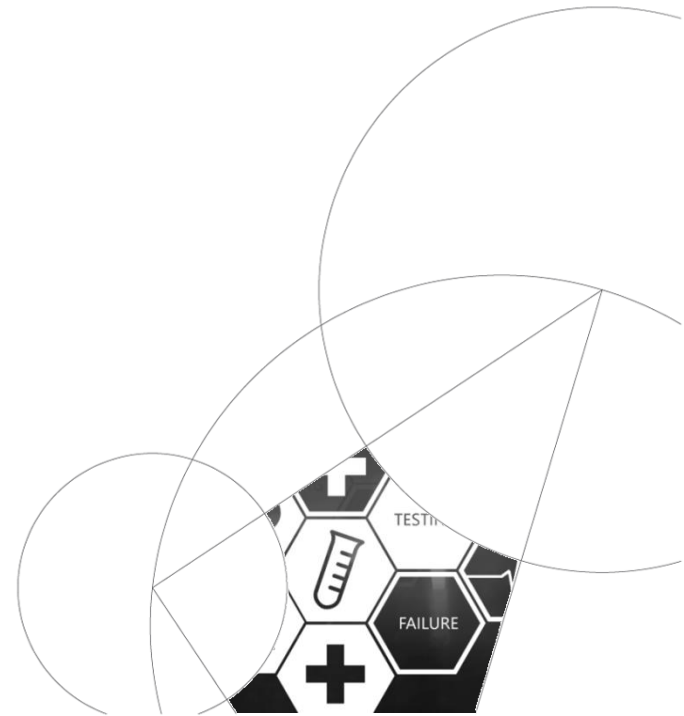
# 1. Financial strain

- ODX of malaria
  - increased household cost
- ODX of pulmonary embolism
  - 71% increase in total charges
- Labelling of hypertension
  - decrease in annual income of CAD 1,093



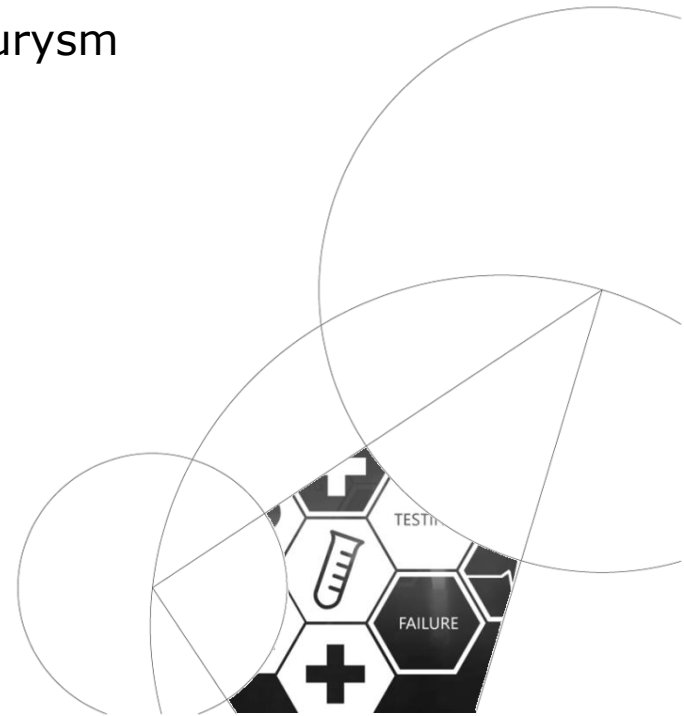
## 2. Medical costs

- PSA-screening
  - 39% of total costs (€23,669,000) spent unnecessarily
- ODx of asymptomatic carotid artery stenosis
  - unnecessary interventions, equivalent to USD 2.1 billion
- Treatment of asymptomatic bacteriuria
  - significantly increased hospitalization days



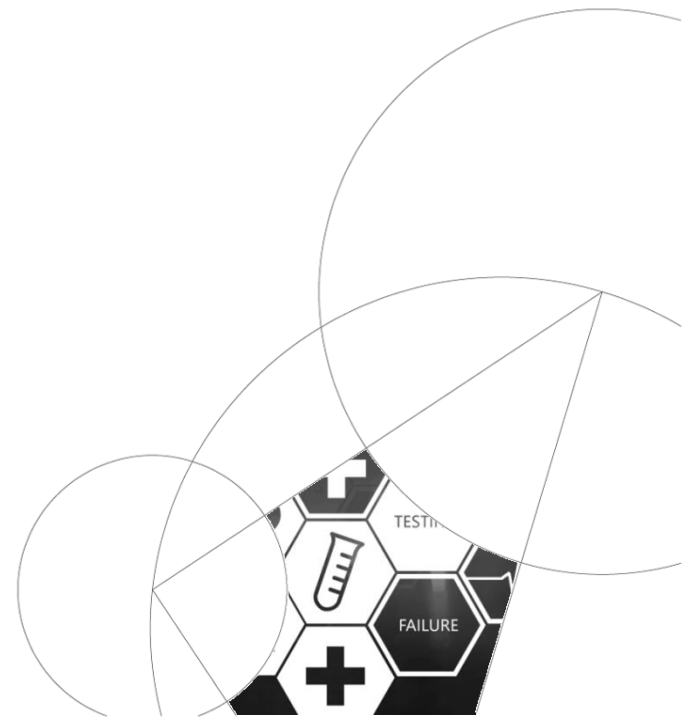
### 3. Opportunity costs

- ODx of osteoporosis
  - increased cautiousness and preventive actions
- Labelling of hypertension
  - withdrawal from enjoyable activities
- ODx of asymptomatic abdominal aortic aneurysm
  - decrease in self-perceived, functional status



## 4. Hassles/inconveniences

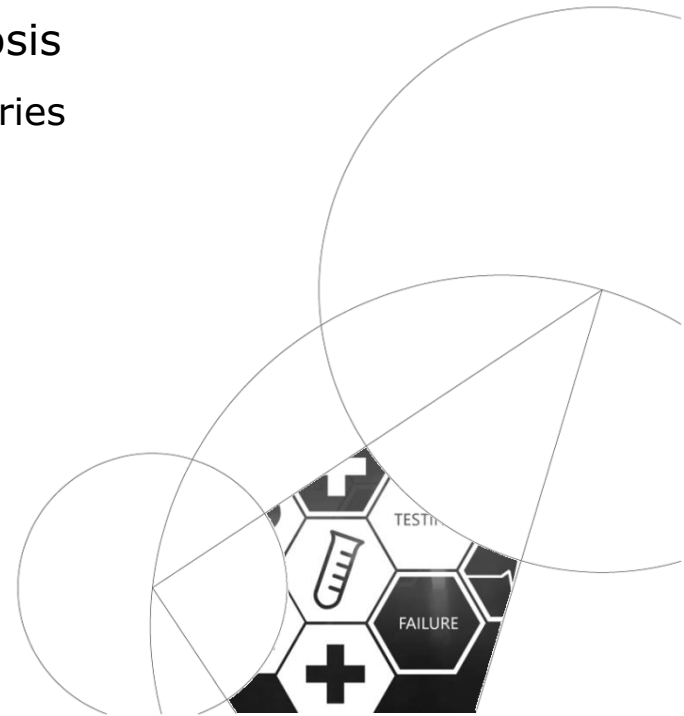
- Treatment of asymptomatic hemochromatosis
  - inevitable change of plans
- Labelling of hypertension
  - about 50% increase in doctor's visits due to hypertension-related motives
- ODx of asymptomatic celiac disease
  - dietary restrictions





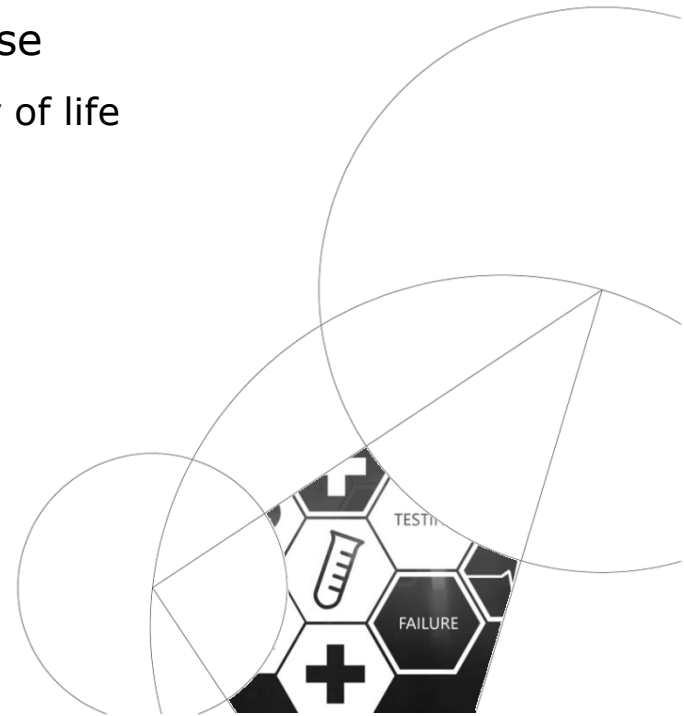
## 5. Physical harms

- Treatment of prostate cancer
  - urinary incontinence, bowel leakage, erectile dysfunction etc.
- ODX of prostate cancer
  - increased suicide ratio (1.4)
- Treatment of asymptomatic bacterial vaginosis
  - significantly increased risk of preterm deliveries



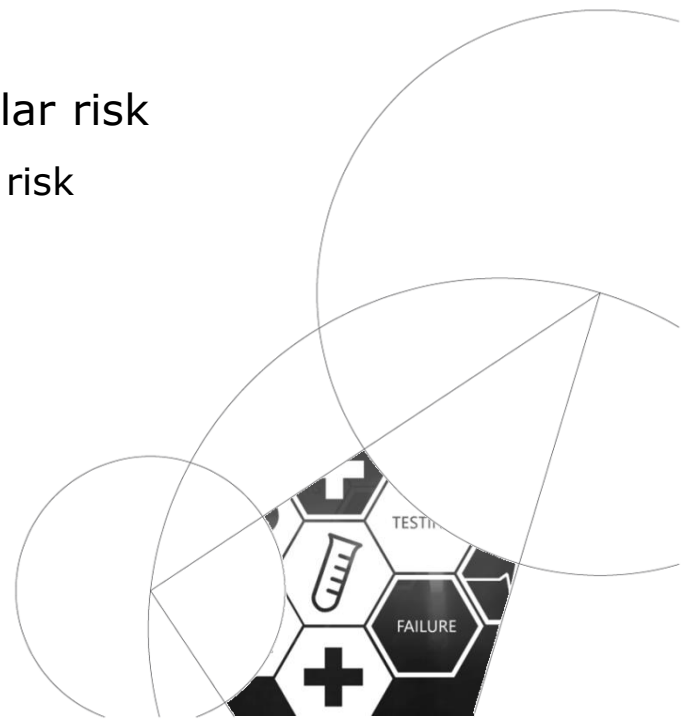
## 6. Psychological harms

- Labelling of hypertension
  - deleterious psychological consequences
- ODx of ductal carcinoma in situ
  - substantial anxiety in 10%
- ODx of chronic obstructive pulmonary disease
  - significant decrease in health-related quality of life



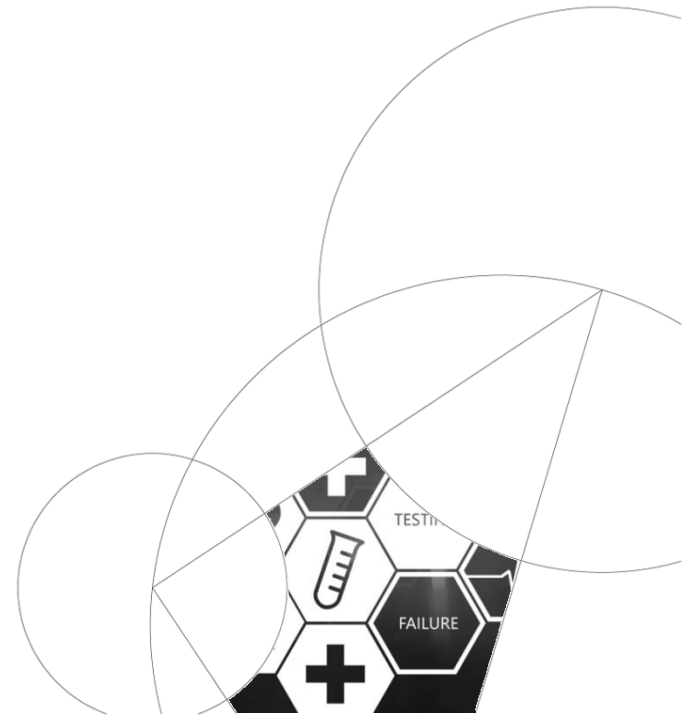
## 7. Work-related costs

- Screening and referral of hypertension
  - significant increase in absenteeism in the following year compared to control group
- Labelling of hypertension
  - increased absenteeism relative to previously aware hypertensives
- Awareness of moderate-to-high cardiovascular risk
  - increased sick-leave duration relative to low risk



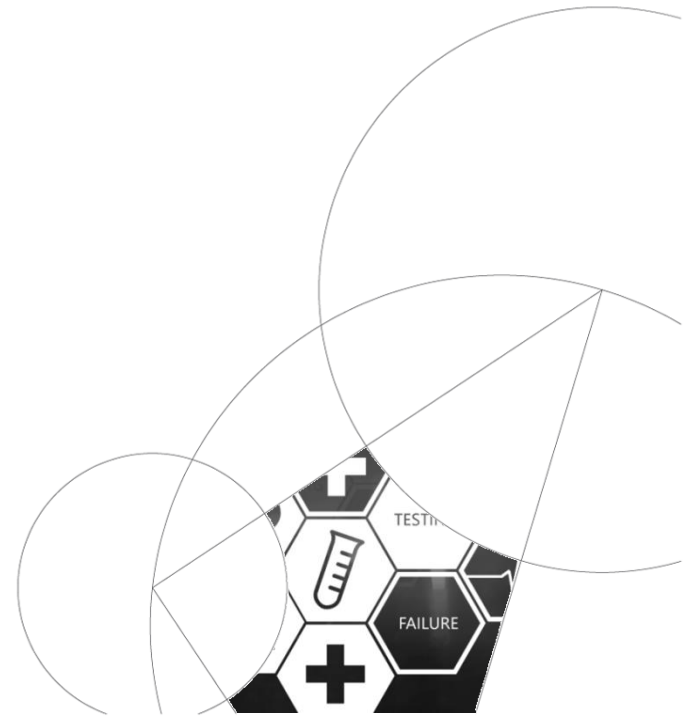
## 8. Societal costs

No studies identified



## Limitations

- Only diseases included where overdiagnosis has been confirmed
- Risk of missing relevant studies



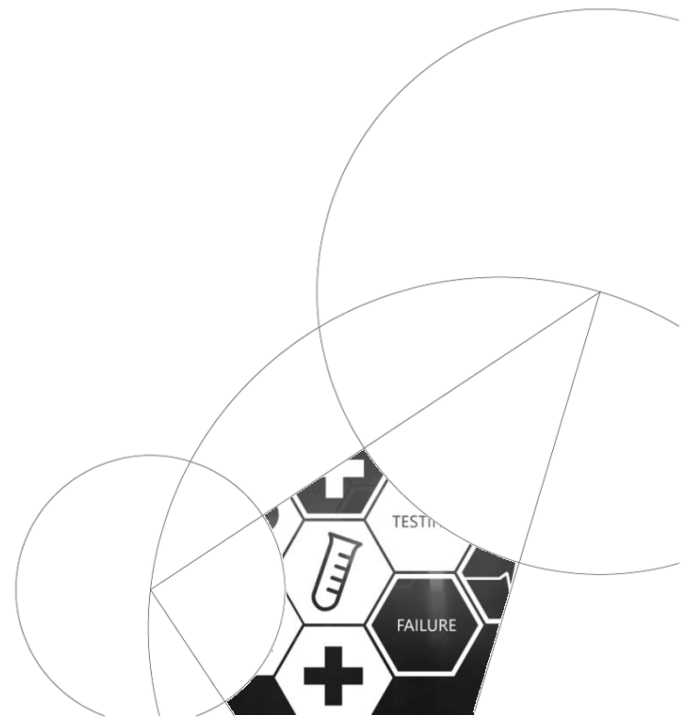
## Conclusion 1

Empirical evidence on the aspects of:

1. Financial strain
2. Medical costs
3. Opportunity costs
4. Hassles/inconveniences
5. Physical harms
6. Psychological harms
7. Work-related costs

No studies evaluating:

8. Societal costs



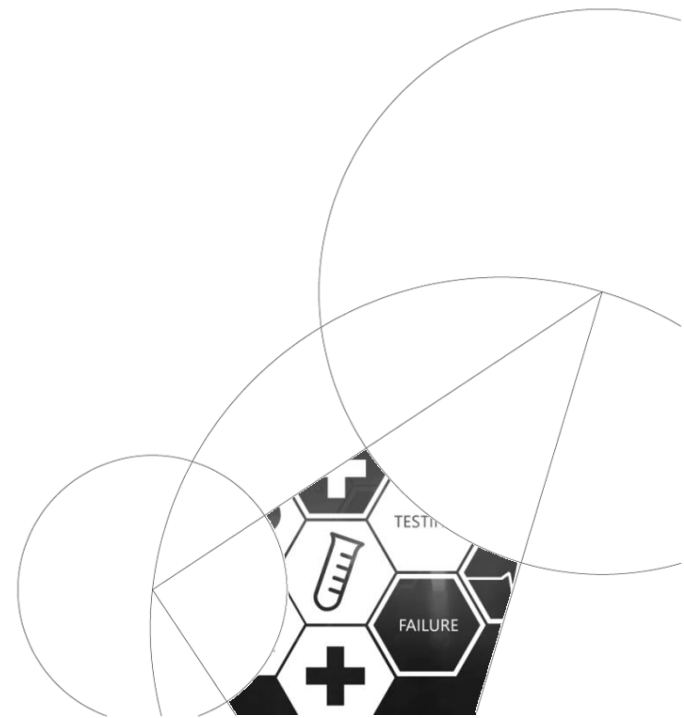
## Conclusion 2

### Numerous studies:

5. Physical harms
6. Psychological harms

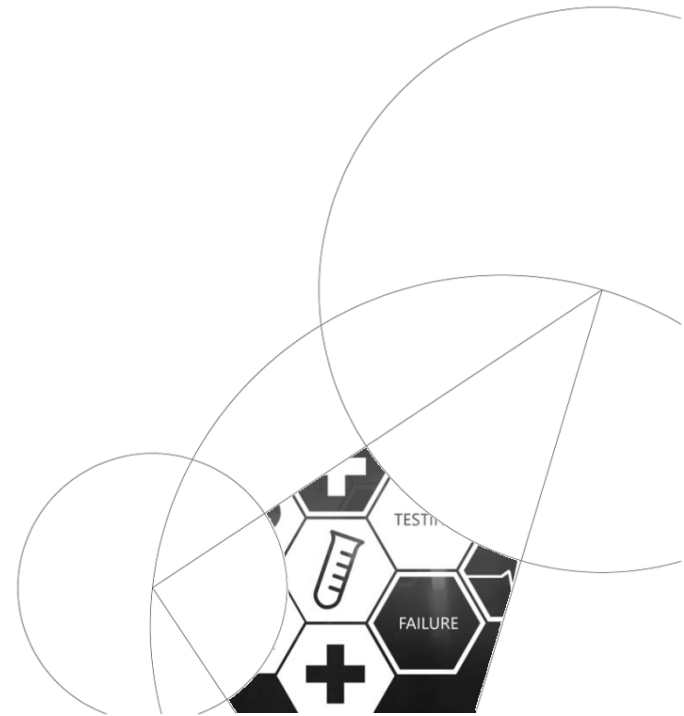
### Few studies:

1. Financial strain
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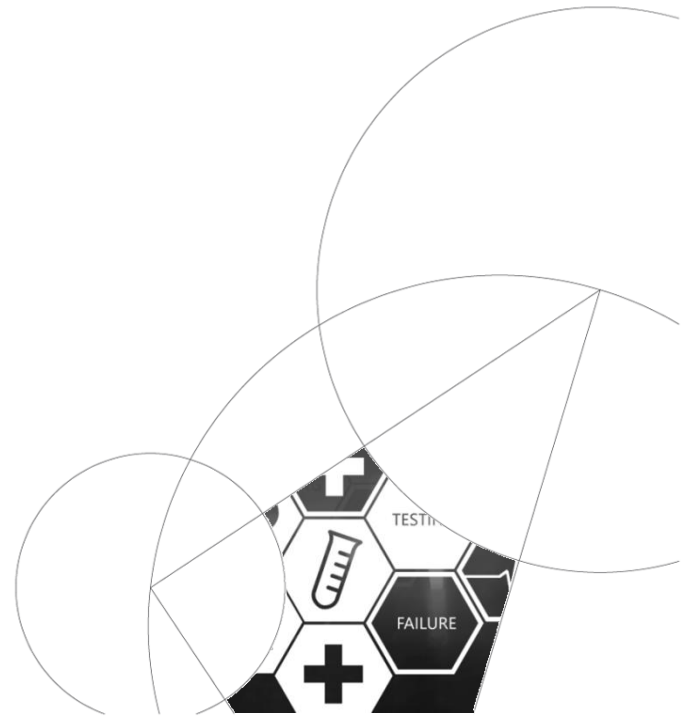
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## Definitions

### Overdiagnosis:

An (asymptomatic) person is diagnosed with a condition which, if not identified, would not have caused any harms during their lifetime

### False positive:

A test indicates that a condition is present, when in fact it is not  
("grey zone" between normal and abnormal tissue)

### Misdiagnosis:

Incorrect diagnosis of a symptomatic person with a condition they do not have  
(overdiagnosis until misdiagnosis is defined)

Stacy M. Carter et al.  
The challenge of overdiagnosis begins with its definition  
BMJ. 2015; 350: h869

