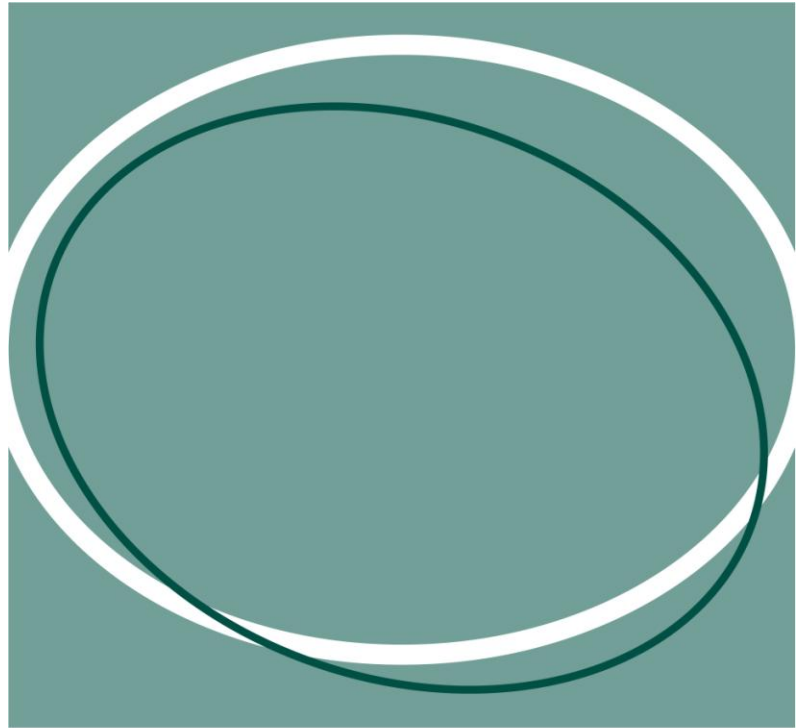


SENSE ABOUT SCIENCE

MAKING SENSE OF SCREENING

A guide to weighing up the benefits and harms of health screening programmes

Assembled by Chun-Yin San,
Sense About Science intern



sense about science

Sense About Science is a charity that helps people to make sense of science and evidence in public debate

Screening – a complex topic

Public expectations about screening still don't match what screening programmes can deliver.

Prostate test for all men over 50

Those in power, pay attention and stop allowing young women to die needlessly

Force the government to retract the decision and return to it to 18

Then there are the five women under 25 who go on to die of cervical cancer every year.

That is five families in mourning, and their grief is unnecessary.

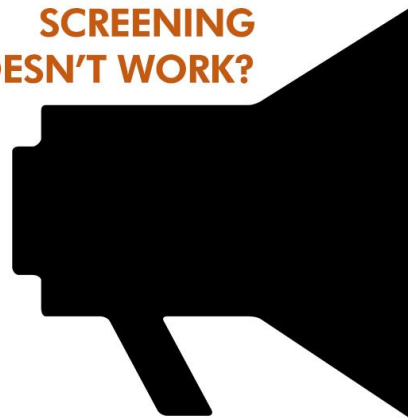
I feel quite passionately that the age for smear test screening should be lowered to 20 like the rest of the UK. The most at risk age is 20 to 29 so with the current

PSA is unreliable but it can save lives, its not expensive so why not test all men plus along side a physical exam at the same time, uncomfortable but very cheap.

MORE SCREENING FOR MORE PEOPLE?



SCREENING DOESN'T WORK?



Unnecessary procedures might be a more accurate way to describe what might happen. What about unnecessary deaths? Women

About two-thirds of men with raised PSA levels turn out not to have prostate cancer; but they have to go through a battery of further tests including rectal examinations, transrectal ultrasounds and prostate biopsies

The diagnosis of a disease, such as prostate cancer, for which no treatment has been shown to increase life expectancy, may result in treatments that impair the quality of life (causing impotence and incontinence) without extending its duration.

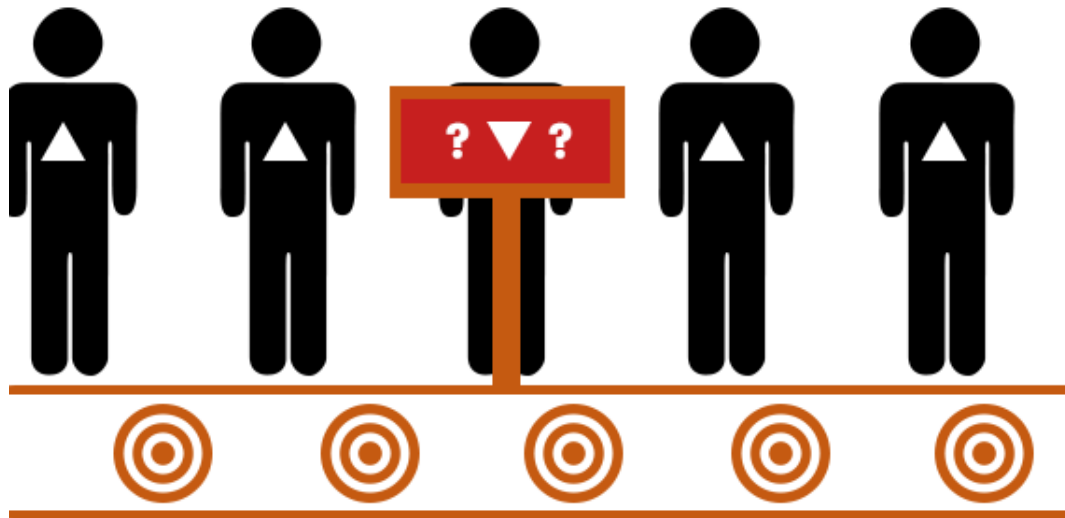
Breast cancer screening peril

What is screening?

Screening programmes are public health programmes designed to reduce the harm caused by disease in a defined population.



What's the aim of screening?



Screening programmes aim to detect signs that a disease might develop in people who otherwise feel entirely well.

The idea is that the disease can be prevented from progressing to a further stage when treatment is more unpleasant or less likely to succeed, when damage may be permanent or symptoms distressing.

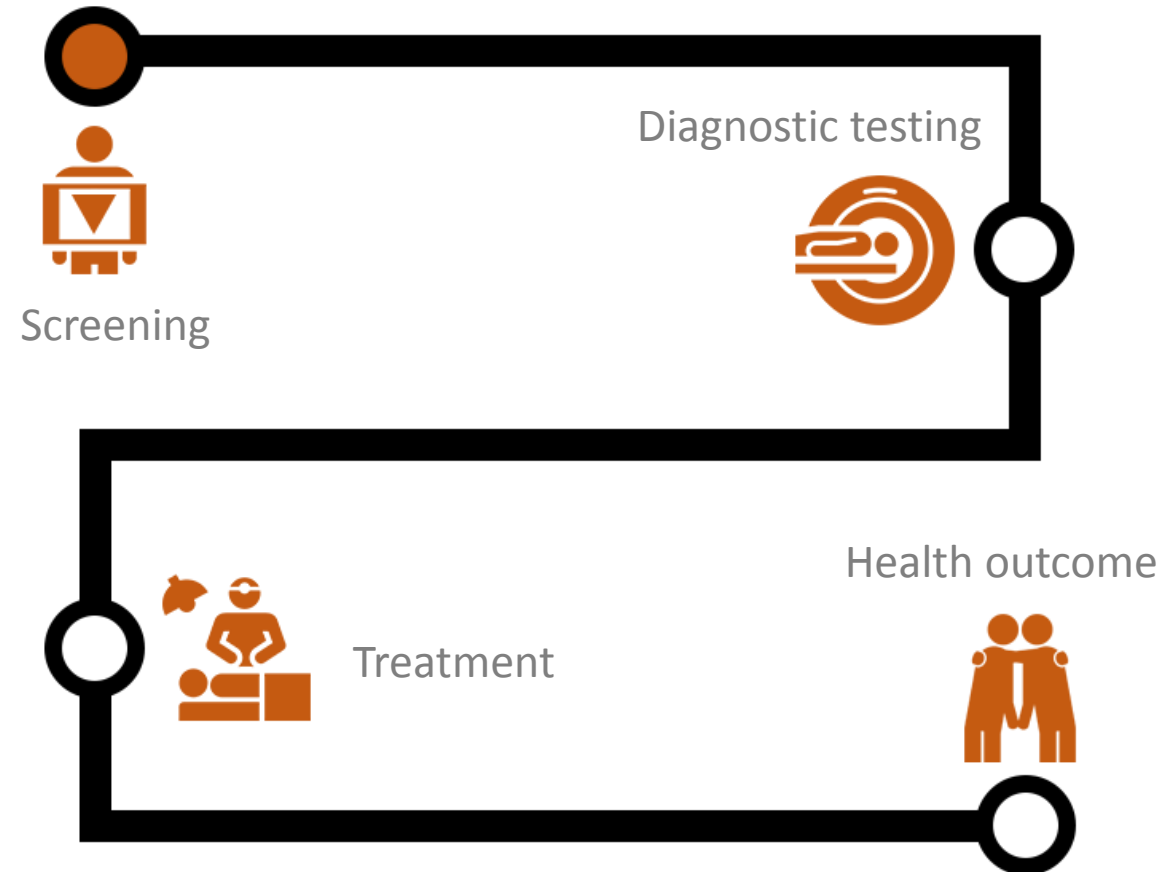
Making Sense of Screening

What does screening do?

Screening aims to detect signs (risk markers) before symptoms of an illness appear.

If a screening test is positive, further (diagnostic) tests can then take place to see whether the disease is actually present, so treatment can start as early as possible.

Screening doesn't always prevent disease or inform treatment; it only detects early signs which the person would otherwise not have known about.



Screening tests versus diagnostic tests

DIAGNOSTIC TESTS



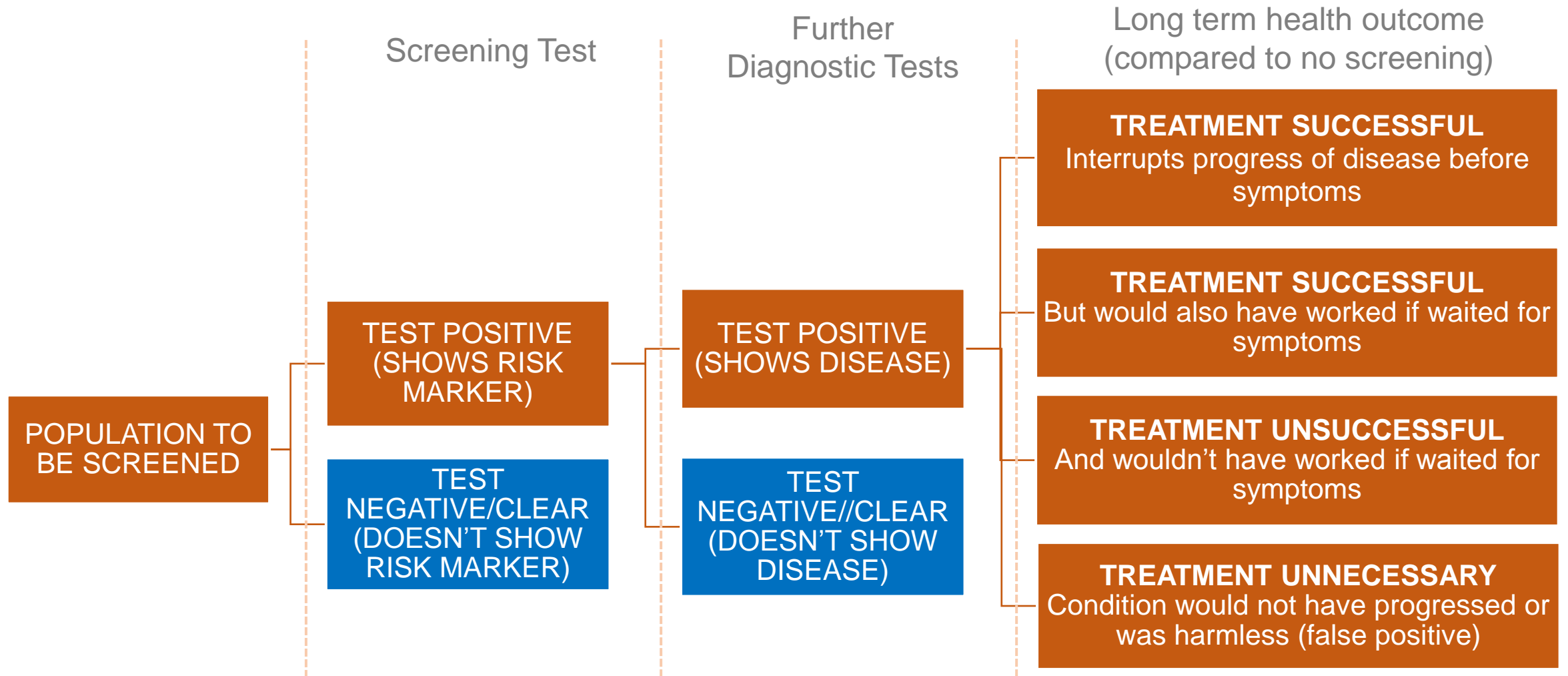
For people showing symptoms of a disease, to assess whether they have it or to follow its progress.

SCREENING

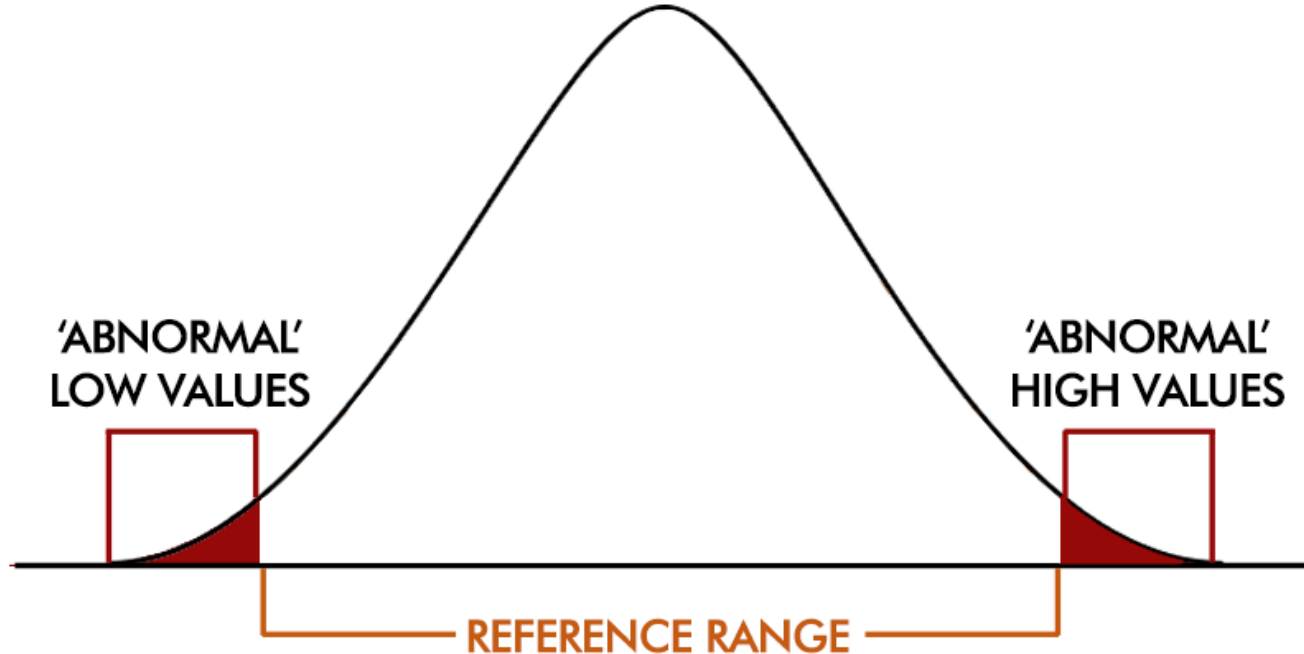


For people showing no symptoms, to identify those with a risk marker for the condition and to divide them into high and low risk.

What are the outcomes of screening?



Will a 'positive' screening result definitely indicate disease?



It's complicated – screening doesn't give you a 'yes' or 'no' answer. Each person is slightly different, and this is the same with risk markers. To deal with this, some tests compare a person's results to a range of 'normal' results, or a reference range.

However, some healthy people's results will fall outside this reference range (and vice versa). This may be because the test isn't accurate enough or because of natural differences from one person to another.

Will a 'positive' screening result always require treatment?

NO.

People who have a 'positive' screening result (i.e. shows a risk marker) are then offered further (diagnostic) tests. Some of these will get negative diagnostic test results (i.e. don't show the disease) and will not be offered treatment. These are known as false alarms.

Other people will have a 'positive' diagnostic test result (i.e. shows disease) and will be offered treatment. However some of these people will not go on to develop the disease despite a 'positive' result. For example, detectable tumors can be benign in nature and unlikely to develop into cancer or cause symptoms. These people wouldn't have required treatment, so are referred to as 'false positives' or '**overdiagnosis**'.

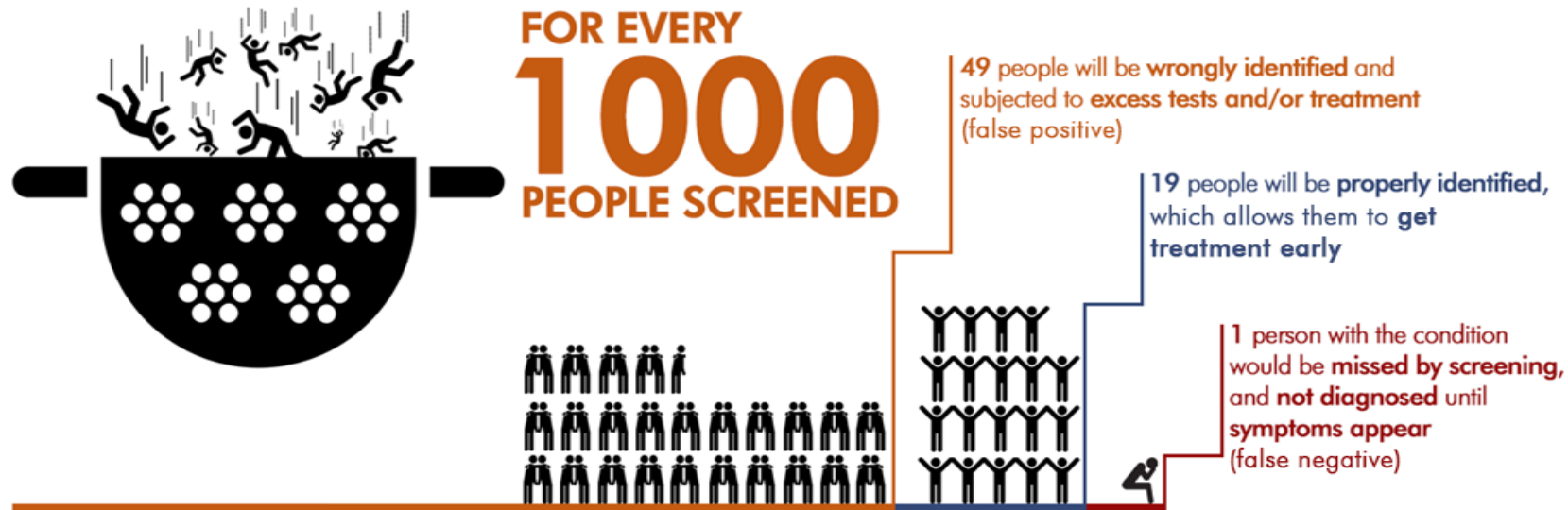
As doctors are unable to know which individuals are over-diagnosed, some people will undergo treatment which may have been unnecessary.

What are the limitations of screening?

Screening tests are not 100% accurate; people may be missed or wrongly identified.

SCREENING FOR EVERYONE?

Not so fast. Screening tests are never 100% accurate and can cause more harm than good. For instance, in a screening programme with 95% accuracy for a disease present in 2% of the population...



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Who should be screened?

Screening should be for those who are most likely to benefit, taking into account a number of factors, such as:

AGE



Some conditions are more likely to affect particular age groups, e.g. bowel cancer (over 60's)

EXPOSURES



Some conditions are likely to affect groups with certain exposures, e.g. tuberculosis (travel to high-risk areas)

GENDER

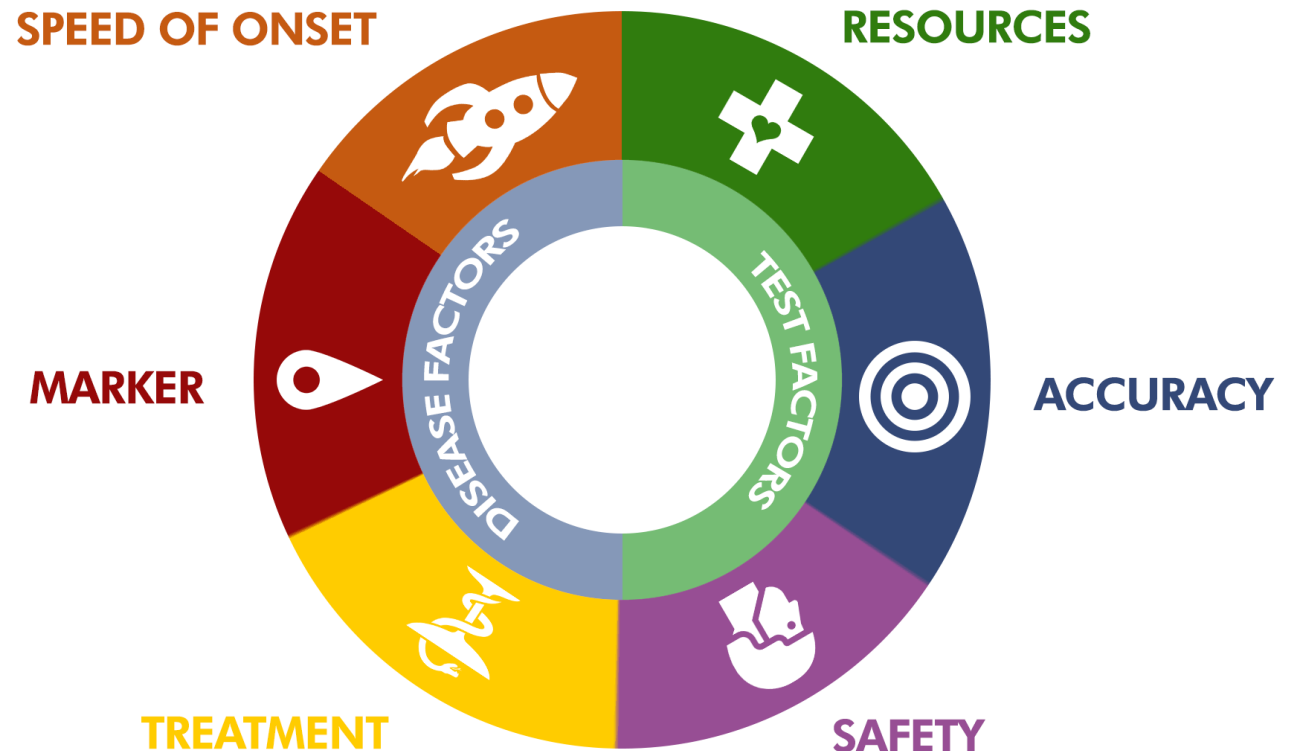


Some conditions are gender-specific, e.g. cervical cancer (women)

Why not screen everyone for everything?

It might seem sensible that we should screen as many people and diseases as we can. However, only certain diseases are suitable to be screened for. Increasing the number of people screened can end up causing more harm than good.

Before any screening programme is implemented, the UK National Screening Committee has to evaluate it thoroughly, taking into account many factors.



Why not screen everyone for everything?

Sometimes a screening programme might not be implemented because the nature of the condition makes it unsuitable for screening tests.

MARKER

The condition should have a good marker for the screening test. e.g. PSA is a poor marker for prostate cancer, as elevated levels may be normal

TREATMENT

The condition being screened for should have an effective treatment and ideally benefit from early treatment

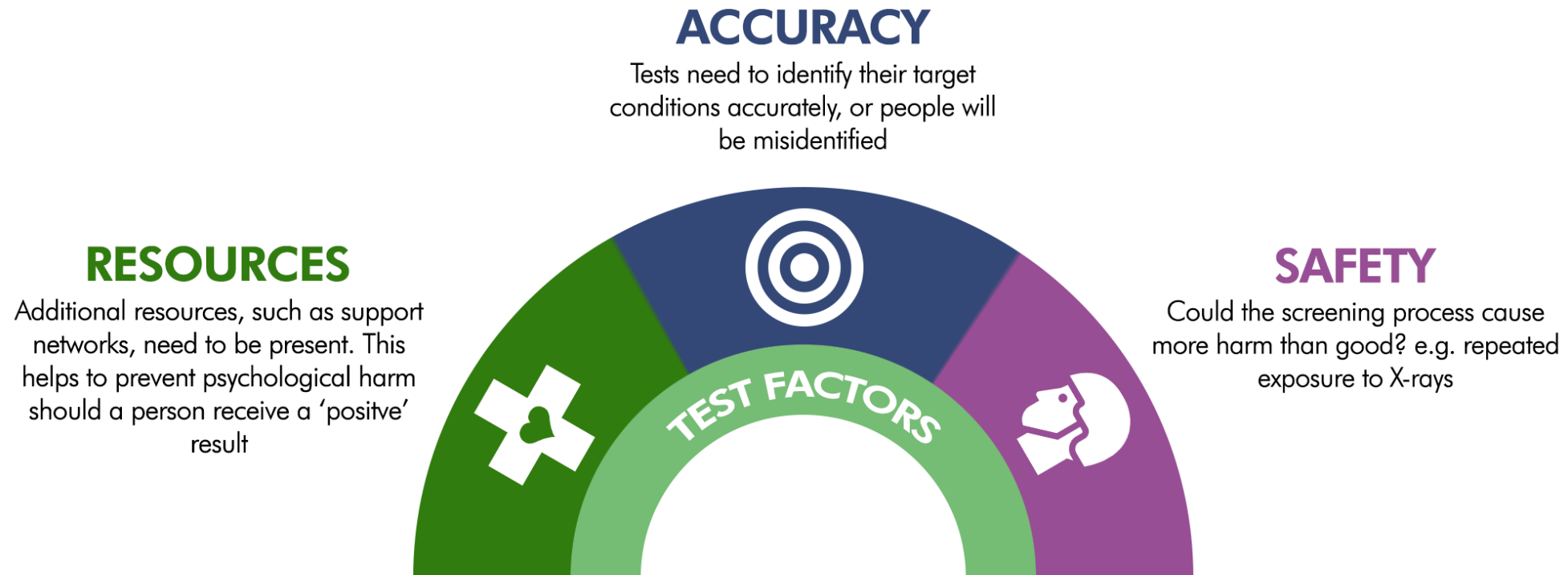


SPEED OF ONSET

Conditions which take a long time to develop tend to be easier to screen for than ones which develop very quickly. Conditions that develop quickly are better identified by diagnostic tests e.g. ebola

Why not screen everyone for everything?

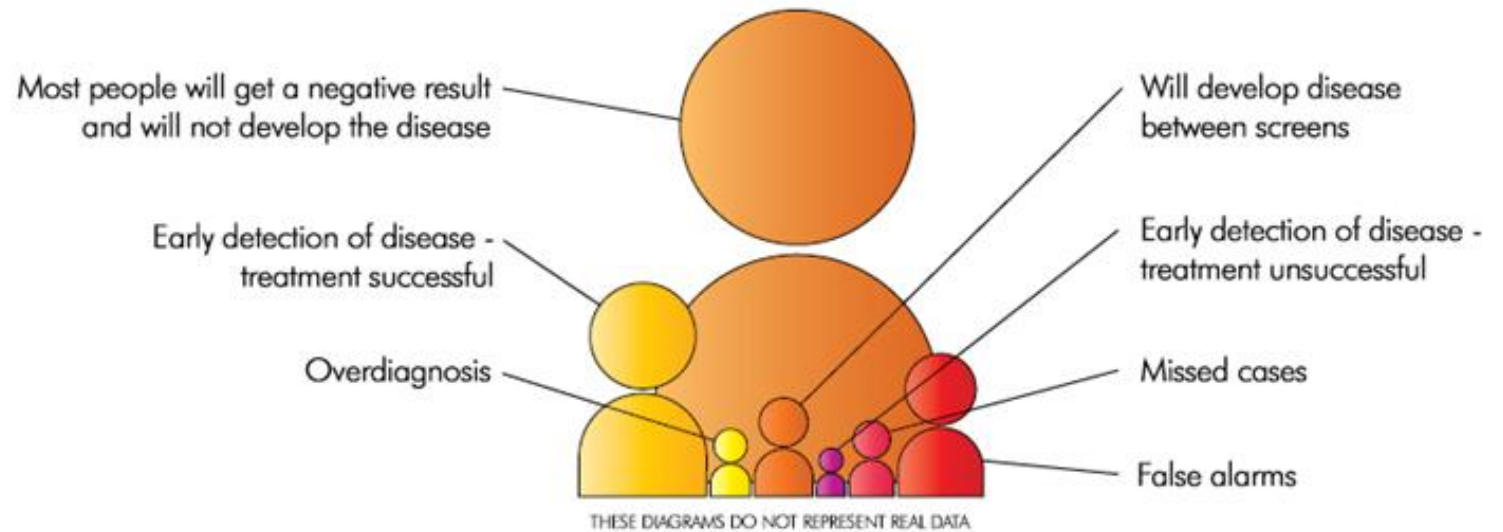
The screening test itself might be unsuitable and could do more harm than good.



Making changes to screening programmes

Should changes be made to a screening programme, such as who is invited for screening or the test that is used, the overall calculation of the benefits compared to the risks has to be made again.

A change in one part of the programme can affect the balance between those who benefit and those who don't.



CHANGING ANY PART OF A SCREENING PROGRAMME
can change the number of people experiencing different outcomes

This will need thorough re-evaluation to ensure that the screening test will always produce more benefit than harm

Is it fair to leave out some groups from screening?

If screening is made available to everyone (including those at low risk), it reduces its accuracy and dilutes its benefits. In some cases, it may cause more harm than good, so the risks should always be weighed against the benefits.

FALSE ALARMS & POSITIVE RESULTS

There's potential for psychological harm from worry following a positive screening result. The harm from anxiety is often underestimated. It can have a profound impact on people's life choices and relationships, or itself lead to being ill.

FALSE POSITIVES & OVERDIAGNOSIS

People with abnormal results that will never develop into the disease are likely to still undergo treatment which may be unnecessary. This can pose risks, for example infections from surgery.

FALSE NEGATIVES & FALSE REASSURANCE

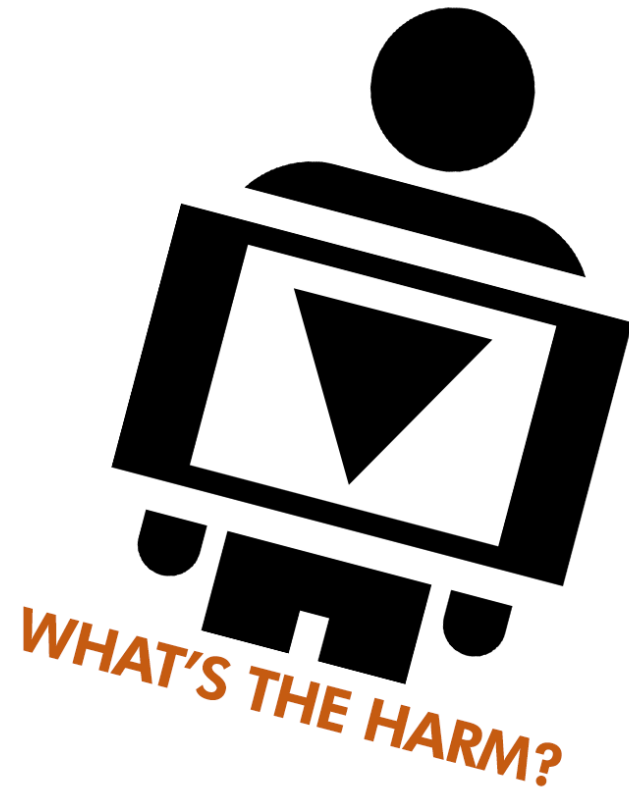
Negative results can lead to false reassurance. An apparently 'clean bill of health' can discourage people from seeking advice about symptoms they experience.

HARMS FROM SCREENING TESTS

A screening test itself may carry a small risk of harm. For example, repeated exposure to X-rays is known to cause cancer in rare cases.

HARMS FROM FURTHER TESTS

Further investigations can cause harm. For example, a colonoscopy used in diagnosis of colon cancer causes a perforated bowel in 1 in every 1000 tests.



Summary

- Screening rarely benefits all sections of the population.
- Screening can have negative effects, so it needs to be targeted at those most likely to benefit.
- Screening can identify some of the people who have a disease but it cannot prevent disease.
- Screening cannot give you a 'yes' or 'no' answer and an 'all clear' does not mean you will not go on to develop the disease.
- Screening tests differ from diagnostic tests.

Making Sense of Screening

This slideshow is based on the 2015 printed edition of *Making Sense of Screening*

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Making Sense of Screening



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