


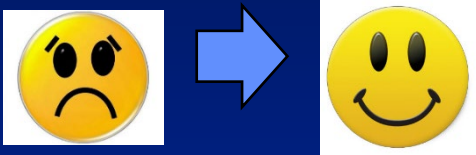
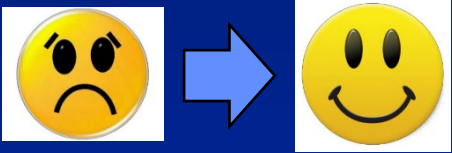

Potential New Cancer Screening Programmes

Prof. Bob Steele

University of Dundee and UK NSC



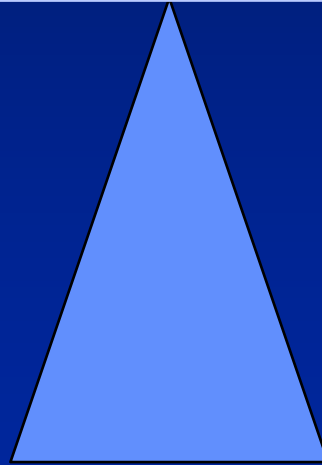
Screening is Popular

- *Most* people have a negative test 
- *A few* people have screen-detected disease and are cured 
- *A few* people have a false +ve test 
- *A few* people are harmed by false reassurance, investigations or treatment 

Benefit to
people
with disease

Harm to people
with disease
and

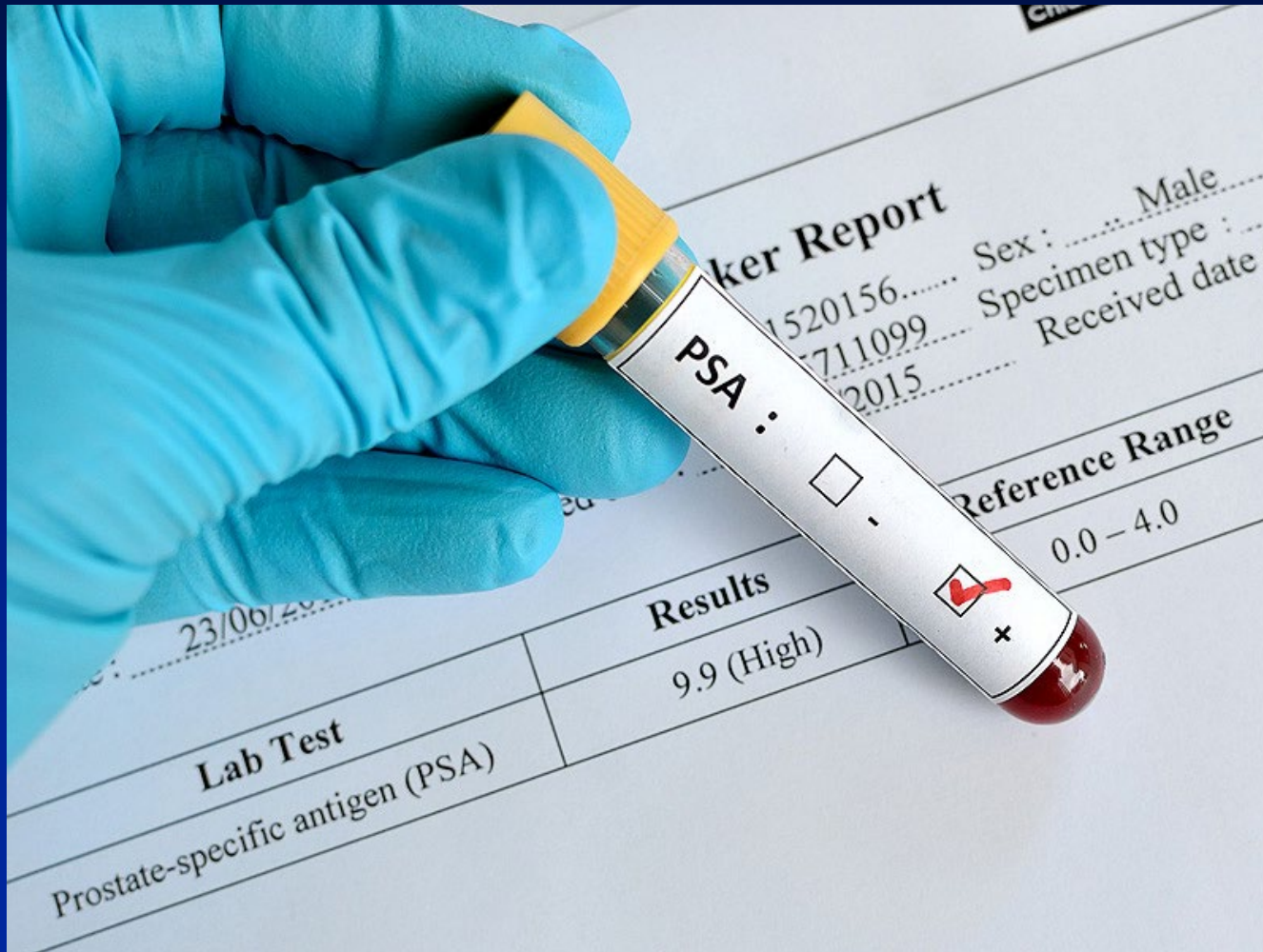
HARM TO THE
HEALTHY
POPULATION



Possible Future Population Cancer Screening Programmes

- Prostate
- Ovary
- Lung

Prostate Cancer Screening



RCTs of PSA Screening

21% reduction in prostate cancer deaths

but...

28 patients needed to treat to prevent 1 cancer death

1 cancer death avoided for 1000 men screened over 10 years

Harm

- Biopsy induced sepsis
 - 1/1000 screened
- Side effects of Surgery
 - Incontinence - 3/1000 screened
 - Impotence – 25/1000 screened

ProtecT Study

- PSA-detected early prostate cancer
- Three-way randomisation
 - Active monitoring
 - Conformal RT + NA androgen suppression
 - Radical Prostatectomy

ProtecT Study Results

- No difference in prostate cancer deaths at 10 years
- *But* – higher rates of metastatic disease in the active monitoring group.

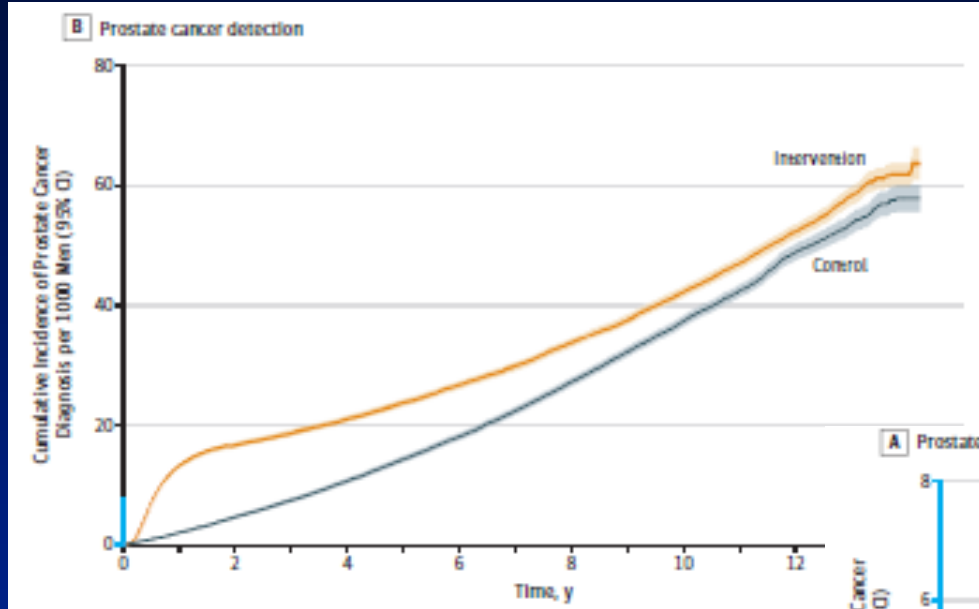
CAP Trial

2001-2009 (FU until 2016)

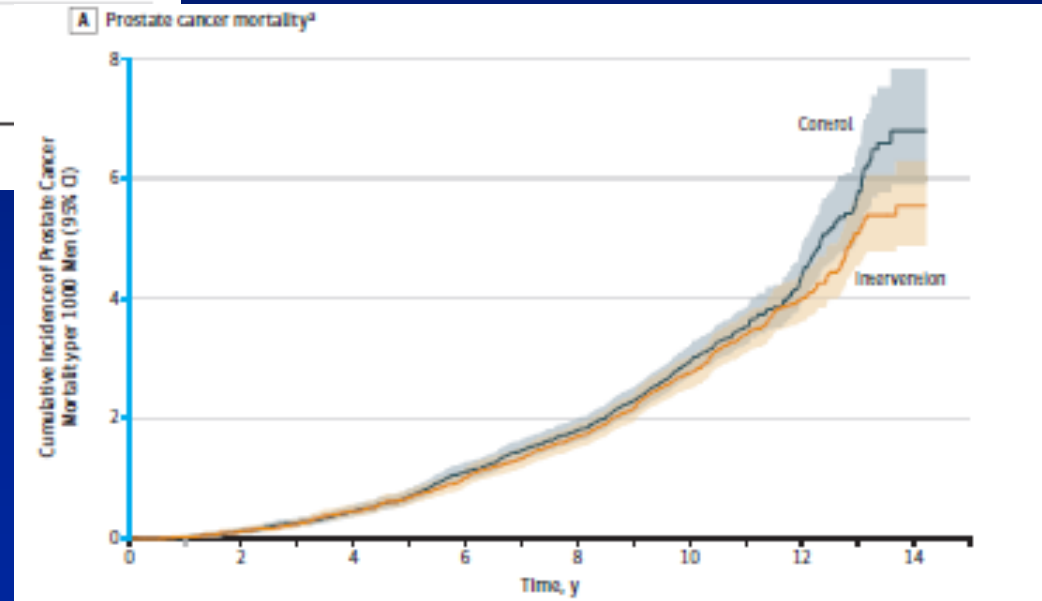
- Cluster RCT of PSA Testing
- Random assignment of primary care centres
 - Standard Care (no routine PSA testing)
 - ProtecT (written invitation to PSA testing to 228,966 men in 337 practices)

CAP Trial

Martin et al
JAMA
2018



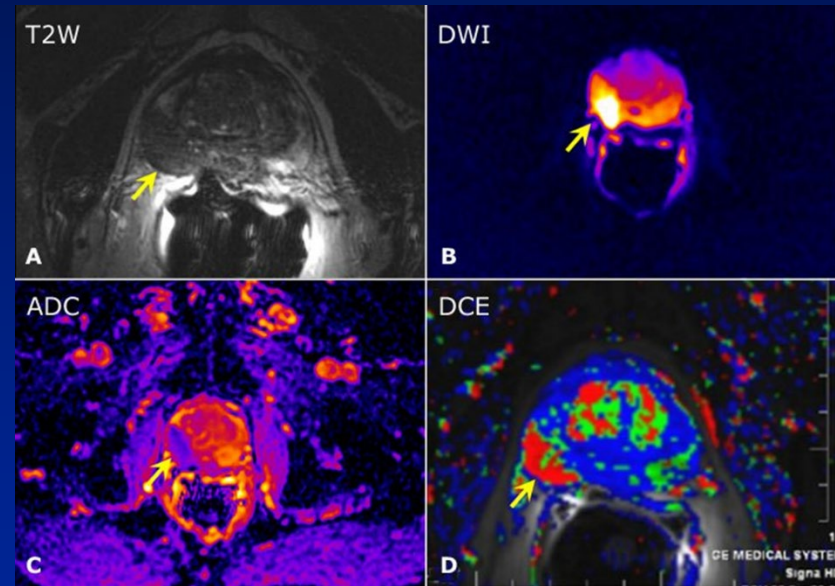
Incidence



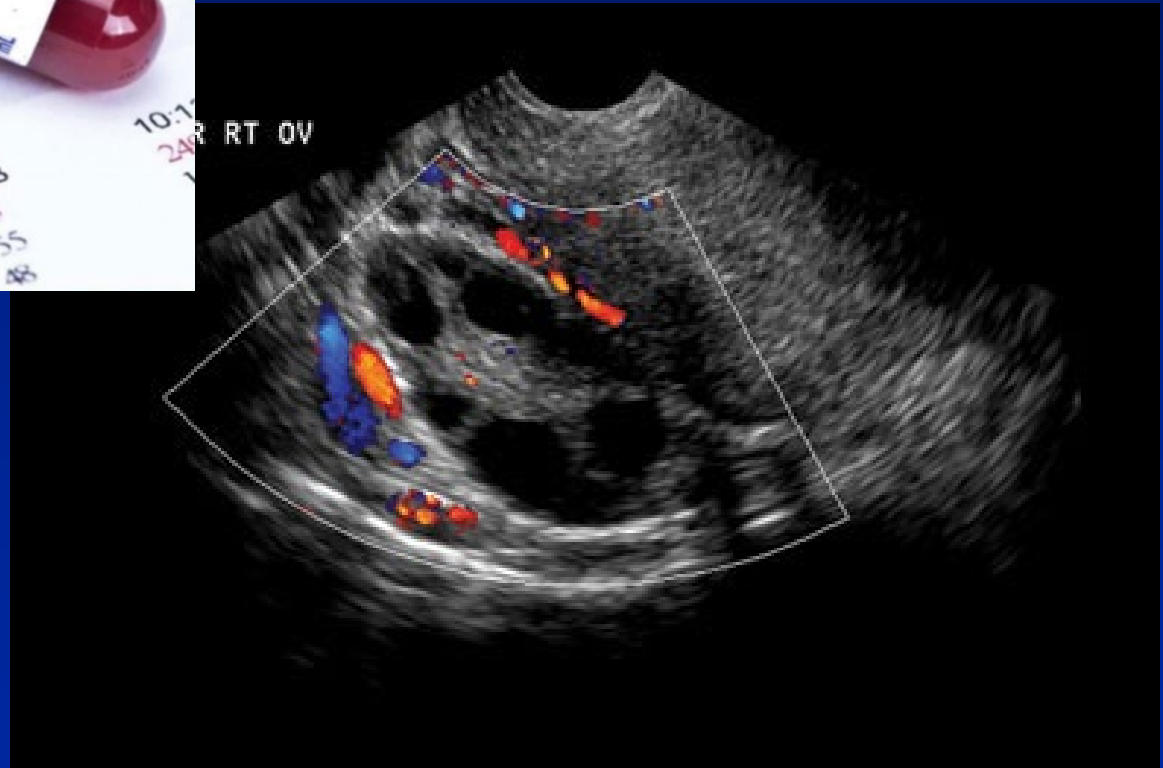
Mortality

Where now?

- More discriminatory biomarkers?
- PSA trajectory?
- Multiparametric MRI?
- PET/CT/MRI?



Ovarian Cancer



UKCTOCS RCT

- 202638 women aged 50-74 randomised between 2001-2005
- No screening
- Annual transvaginal ultrasound (TVU)
- Annual CA125 with TVU if indicated by ROCA (MMS)

UKCTOCS – 14 yr FU

Arm	Sensitivity %	Specificity %	PPV %
MSS	89.4	99.8	43.3
TVU	84.9	98.2	5.3

Disease specific mortality reduction over 14 years:

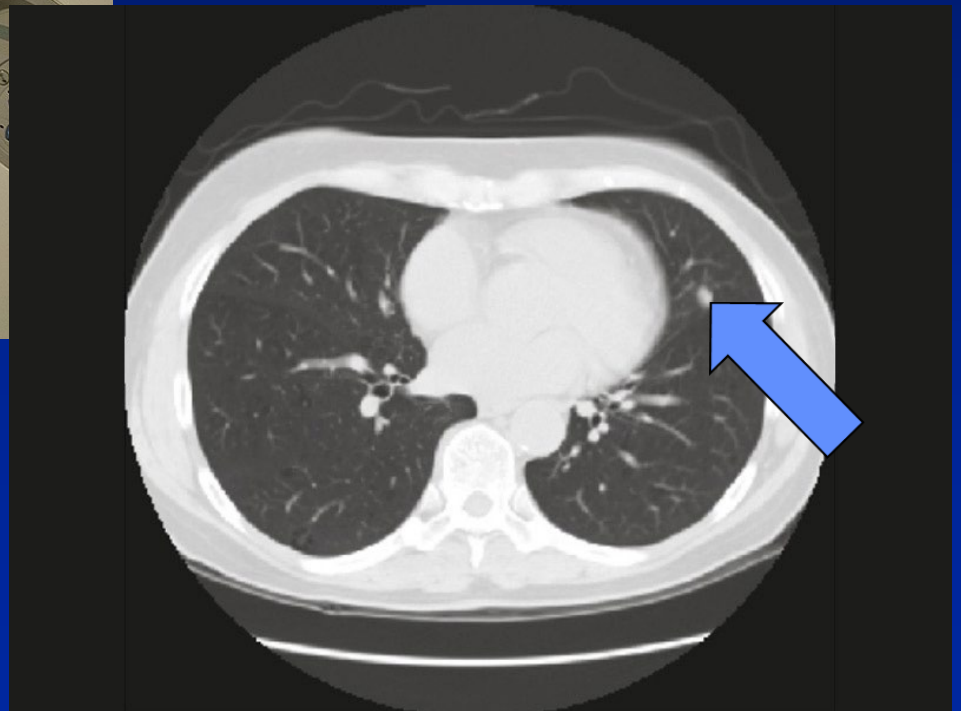
MMS – 15%

TVU – 11%

Not significant – Longer term follow up needed

Update expected February 2021

Lung Cancer Screening



NELSON

2003-2015

- High risk group identified by questionnaire to 50-75 age range
 - Response rate 25%
- Current or former smokers aged 50-75 (n=15600) recruited into trial
 - 20.5% eligible
 - 50% agreed
- CT vs. No screening
- 26% reduction in LC death

What does the evidence tell us?

- LDCT in engaged, high-risk people prevents lung cancer death
- Therefore, those at risk should have the opportunity to request LDCT screening

What does this *not* tell us?

That *population* screening for lung cancer is necessarily a good thing.

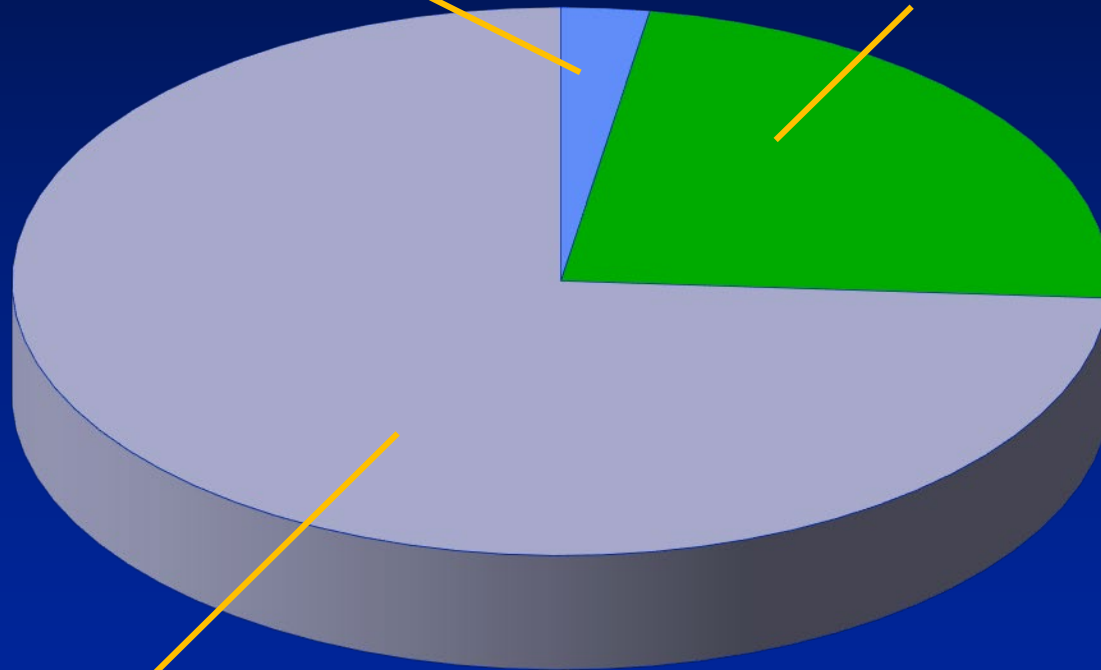
Because...

- 2.6% of target population entered trial
- But ~ 26% of adults in Belgium and the Netherlands were smoking daily in 2015
- 10% of the target population entered the trial

Why does this matter?

A - high risk in trial

B - high risk not in trial



C - not high risk

A is *not* the same as B

If B is identified and invited:

- They may not attend
 - More likely in those of lower SES
- They are likely to be heavier smokers with more co-morbidity
- Therefore *may*
 - Be less able to withstand treatment
 - Have more false positives
 - Have more aggressive disease

Harm to the “Healthy” Population ?

- False positives leading to invasive investigation
- False positives leading to early repeat LDCT
 - psychological morbidity
- Use of radiology resource
- Effect on quit rates?

Where now?

- Can we recommend screening for lung cancer?
 - Yes, for those that wish to engage
- Can we recommend *population* screening for lung cancer?
 - Not yet

Way forward for targeted Lung Cancer Screening

- Information aimed at the general population and general practice
 - Current and past smokers should be considered for LDCT screening *and* smoking cessation
- Clear process for a targeted screening programme with managed and efficient recall (surveillance) and strict quality assurance

What is needed for a population screening programme?

- Reliable method of identifying *the whole* at-risk population
- Evidence from randomisation at the point of invitation

“All screening programmes do harm. Some do good as well and, of these, some do more good than harm at reasonable cost. It is the responsibility of policy-makers, public health practitioners, managers and clinicians to ensure that only programmes that do **more good than harm at reasonable cost** are implemented and, when they are implemented, that they are managed in such a way as to achieve a level of quality which will ensure that the balance of good and harm demonstrated in research is reproduced in real life.”



Muir Gray, 2007