Seminar 5: What should we tell women about the effectiveness of breast screening

1. Working in groups of 3 or 4, compare the two breast screening leaflets produced by the NHS and by the Cochrane collaboration. What do you like or dislike about these leaflets? Spend some time thinking about what you have learnt in the lecture and how you would use that information in a fairly simple leaflet that conveys the facts as you understand them. How would this leaflet differ from the two existing leaflets?

   Be prepared to present your ideas to the rest of the group.

2. This looks like a long question because there is quite a lot of information, but it is easy to read and in fact the exercise should be quite quick – not more than 15 minutes.

   There are many cancers that are rare and it would not be cost effective to screen for them. Additionally, for many there is as yet no suitable screening test. In the appendix are three examples of cancers for which there is currently no screening programme in the UK taken from the Cancer Research UK website, lung cancer, pancreatic cancer, and oesophageal cancer. Have a look at the arguments made for not introducing screening programmes. For each:

   a) Identify where the following have been used in coming to a decision about whether to screen or not: incidence, prevalence, sensitivity, positive predictive value, lead time
   b) Which of the Wilson and Jungner criteria have been used in each of the examples?

3. Where oesophageal cancer rates are high the rates are about 10 or 20 per 100,000(http://www.wcrf-uk.org/research/cancer_statistics/oesophageal_cancer_rates.php)

   For comparison breast cancer rates in Belgium are 109.2 per 100,000, and in the UK, 89.1 per 100,000. Consider a relatively rare cancer with a rate of 10 per 100,000. A screening test has been devised that can be used in the whole population. The following table shows the true and false positives and negatives:

True values	Test results	
	+	-
+	9	1
-	9000	90990

a) Calculate the sensitivity and specificity of the test
b) Confirm that the prevalence is as given above
c) Calculate the positive and negative predictive values
d) Imagine you are the UK national screening committee
e) Decide whether you would use this test or not
f) How would you explain your decision to a lay-person? Use similar language to that used in the extracts above
g) Would your decision be different if the cancer had rates similar to those for breast screening?

Appendix: Examples of screening decisions in the UK

Example 1: lung cancer screening in the UK

Extract from http://cancerhelp.cancerresearchuk.org/type/lung-cancer/about/lung-cancer-screening

At the moment there is no national screening programme for lung cancer in the UK. Experts do not consider screening to be a reasonable approach to finding cancer of the lung because of the

- Lack of a sensitive enough test
- Low number of cancers that would be found
- High costs involved
- Risks of current tests

For screening to be introduced, we need a test that is simple, quick, not too expensive and not harmful. Current tests such as X-rays can't usually show early stage cancers and they have some risks. The lungs are very sensitive to radiation and frequent X-rays may cause lung damage. X-rays can also find lung changes that look like cancer and need to be checked by further tests, such as a biopsy, that can cause problems for some people.

Research into lung cancer screening

There is a lot of research going on into finding out whether it is possible to screen particular groups of people who are at high risk of developing lung cancer. People at high risk of lung cancer include people who smoke and people who have lung disease, such as chronic obstructive pulmonary disease. It is always more cost effective to screen people at high risk, rather than to screen everyone.

Research is also going on to try to find better tests to find lung cancer early. Trials are looking at using new methods of detecting lung cancer, including fluorescence bronchoscopy and a new type of CT scan called a spiral CT scan.

You can find detailed information about research into lung cancer screening on the lung cancer research page.

Example 2: Pancreatic cancer screening

Extract from http://cancerhelp.cancerresearchuk.org/type/pancreatic-cancer/about/screening-for-pancreatic-cancer

This page is about the current situation regarding screening for pancreatic cancer. There is information on

- The need for an accurate test
- Screening for people at a high risk of getting pancreatic cancer

The need for an accurate test

Screening means testing people for the early stages of a disease before they have any symptoms. Before screening for any type of cancer can be carried out, doctors must have an accurate test. The test must be reliable in picking up cancers that are there. And it must not give false positive results in people who do not have cancer.

At the moment, there is no screening test reliable enough to use for pancreatic cancer in people at average risk. Cancer of the pancreas is also a relatively uncommon disease. It would cost a lot of money to screen everyone for a disease that only a few people get. So any screening test must be simple and cheap to perform.

Screening for people at a high risk of getting pancreatic cancer

It is more cost effective to screen people thought to be at higher than average risk of pancreatic cancer. But first we must be able to identify all those who are at higher risk. EUROPAC is an organisation involved in researching pancreatic cancer. They are running a screening programme for people who may be at high risk of developing it. This screening is for people over 40 years old who have

- Hereditary pancreatitis
- A high incidence of pancreatic cancer in their family (familial pancreatic cancer). On rare occasions people as young as 30 are considered, depending on their family history

If you are in one of these groups you have a 3 yearly CT scan or endoluminal ultrasound test. You will also have an ERCP. During this procedure, the doctor will take a sample of your pancreatic juice. The researchers examine this for changes in 3 particular genes (the genes are called K-Ras, p53 and p16). If they find any changes in these genes, you have the tests yearly. If there are no gene changes, you continue to have the tests every 3 years.

This screening programme cannot stop you getting pancreatic cancer. But the aim is to diagnose the disease at an early stage when it is easier to treat and is more likely to be curable. It is also part of a research programme that is trying to improve the genetic tests available for cancer of the pancreas.

EUROPAC run a register of families at high risk of pancreatic cancer. This is part of their research to identify faulty genes that increase risk of cancer of the pancreas. High risk families fill in a questionnaire and have blood samples taken when they join the register. If you think your family may be at risk, talk to your own doctor. He or she can put you in touch with the EUROPAC office.

Example 3: Oesophageal cancer

Extract from http://cancerhelp.cancerresearchuk.org/type/oesophageal-cancer/about/screening-for-oesophageal-cancer

What is screening?

Screening means testing people for early stages of a disease before they have any symptoms. Before screening for any type of cancer can be carried out, doctors must have an accurate test to use. The test must be reliable in picking up cancers that are there. And it must not give false positive results in people who do not have cancer. No tests have been shown to decrease the risk of dying from cancer of the oesophagus.

Not all screening tests are helpful and may have risks associated with them. At the moment, the only way to screen for oesophageal cancer is to have an endoscopy and a tissue sample (biopsy) taken from the lining of the food pipe. There is a risk of complications with these procedures, for example, tearing of the oesophagus.

A new screening test is being developed to pick up cell changes that may increase the risk of oesophageal cancer (Barrett's oesophagus). You swallow a capsule (pellet) that expands into a ball in the oesophagus. It is pulled back up the oesophagus using a string and takes samples of the lining as it goes. The ball is sent to the lab and the cells are tested to see if they have any changes that may increase the risk of oesophageal cancer.

At the moment this screening test is being used in clinical trials in the UK in people with heartburn (who are more likely to have Barrett's oesophagus than people who do not have heartburn). In early trials that compared the capsule to endoscopy, patients preferred the capsule. If doctors can pick up Barrett's oesophagus in more people, they may be able to develop better ways of monitoring them for early signs of cancer. And hopefully develop ways of stopping Barrett's oesophagus becoming oesophageal cancer.

Oesophageal cancer screening in the UK

At the moment there is no screening programme for oesophageal cancer in the UK. Experts do not consider screening to be a reasonable approach to managing cancer of the oesophagus because of the

- High costs involved
- Low number of cancers that would be found and
- Risks of the tests that would have to be done

Barrett's oesophagus

Some doctors recommend screening people who have been diagnosed with Barrett's oesophagus. But some specialists in the UK don't think that this helps, because at the moment we don't have a good way of knowing where to take tissue samples from and cancer could still be missed. Doctors also have to take into account the possible risks of damage to your throat from repeated endoscopies. Only a couple of people out of every 100 with Barrett's will go on to get cancer of the oesophagus. Results from the BOSS study will hopefully show whether it is better to monitor people with Barrett's oesophagus every 2 years or to wait until they have a change in their symptoms.

A few people with Barrett's have very abnormal cells (high grade Barrett's oesophagus). These people should see a surgeon for treatment because they have a higher risk of developing cancer. They are not candidates for screening at the moment.