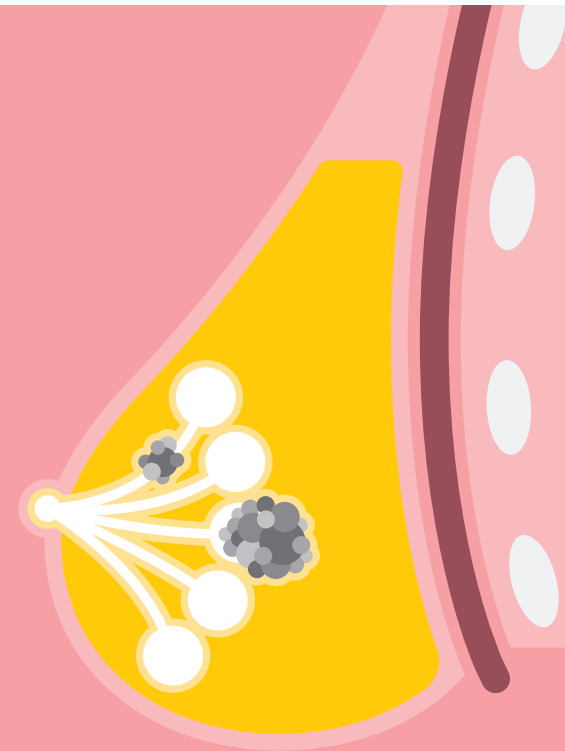


## **Breast cancer**

*A guide for journalists on  
breast cancer and its treatment*



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## Overview

*Each year more than one million women are diagnosed with breast cancer worldwide over half of whom will die from the disease.<sup>1</sup> Breast cancer is the most common cancer and the leading cause of cancer death for women.<sup>2</sup>*

Extensive breast cancer screening programmes and the development of new treatments have improved the prognosis of breast cancer overall. However the average 5 year survival rate for women with late stage or advanced breast cancer remains low. On average only 35% of women with advanced breast cancer are alive five years after diagnosis.<sup>3</sup> A third of women are diagnosed with breast cancer at a late stage<sup>4</sup> when the disease has a poor prognosis.

Treatment options for breast cancer vary depending on the stage at which the cancer is diagnosed. Surgery and radiotherapy are commonly used to treat women with early stage breast cancer.

Chemotherapy, hormonal and targeted therapies are frequently used to treat patients with more advanced forms of the disease.

This guide provides an overview of breast cancer, including: risk factors, symptoms, diagnosis, incidence and treatment options.

# Section 1

## Breast cancer

### i. What is breast cancer?

Breast cancer is characterised by the uncontrolled growth of abnormal cells in the milk producing glands of the breast or in the passages (ducts) that deliver milk to the nipples.

### ii. Types of breast cancer

The type of breast cancer is important in determining the most effective treatment approach. The most common way to classify breast tumours is according to the status of three specific cell surface receptors. These are the oestrogen receptor (ER), the

progesterone receptor (PR) and the Human Epidermal Growth Factor Receptor (HER)2/neu receptor.

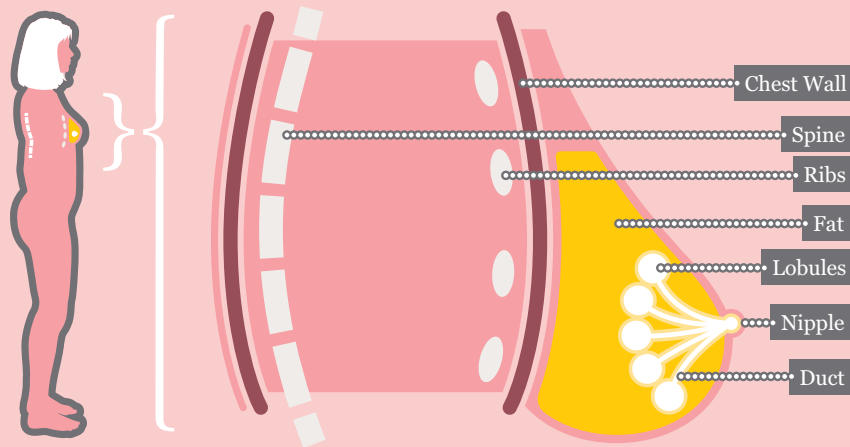
The most common type of breast cancer is known as Hormone Receptor-Positive breast cancer; accounting for around 75% of all breast cancers.<sup>5</sup> This type of cancer grows in response to the hormones oestrogen and progesterone, and as such is likely to respond to therapies that aim to inhibit the growth effects of hormones.<sup>5</sup>

Another type of breast cancer classified by the system is 'HER2-positive breast cancer' which is typified by cells that make too much of a protein known as HER2/neu. It represents 20–30% of Hormone Receptor-Positive breast cancers. Tumours that do not overexpress HER2/neu are described as HER2-negative.<sup>6</sup>

Triple negative breast cancer (TNBC) is a rarer form of breast cancer which is a sub-type of HER2-negative disease. TNBC refers to tumour cells which lack oestrogen and progesterone receptors, and do not overexpress the HER2 protein. This cancer type accounts for around 15% of all breast cancers, and is usually more aggressive and difficult to treat as it does not tend to respond to standard therapies.<sup>5,7</sup> Due to the aggressive nature of this disease it is important to treat patients early; however with few effective treatments available there is a high unmet medical need.

Figure 1 Breast anatomy

### Anatomy of a healthy breast



### iii. Causes and risk factors

There are a number of factors that have been shown to increase a woman's risk of developing breast cancer:

**Age:** The majority of breast cancer cases occur in women over the age of 50.<sup>8</sup>

**Family history:** If a woman has a personal or family history of breast cancer she is at increased risk of developing breast cancer.<sup>1</sup>

**Clinical history:** Women who have previously suffered with benign breast cancer are at greater risk of developing breast cancer in the future.<sup>1</sup>

**A late first pregnancy:** Women who have a late first pregnancy (after the age of 35) are more likely to develop breast cancer.<sup>1</sup>

**Prolonged hormonal exposure:** A long menstrual life or possibly use of hormone replacement therapy after the menopause expose women to an increased risk of developing breast cancer.<sup>1</sup>

**Lifestyle factors:** For example, being overweight or obese after the menopause, physical inactivity, a high fat diet and high alcohol consumption can play an important role in the development of breast cancer.<sup>1</sup>

### iv. Symptoms and diagnosis

The symptoms of early stage breast cancer can often go undetected. There are 12 common signs of breast cancer, these are summarised below:

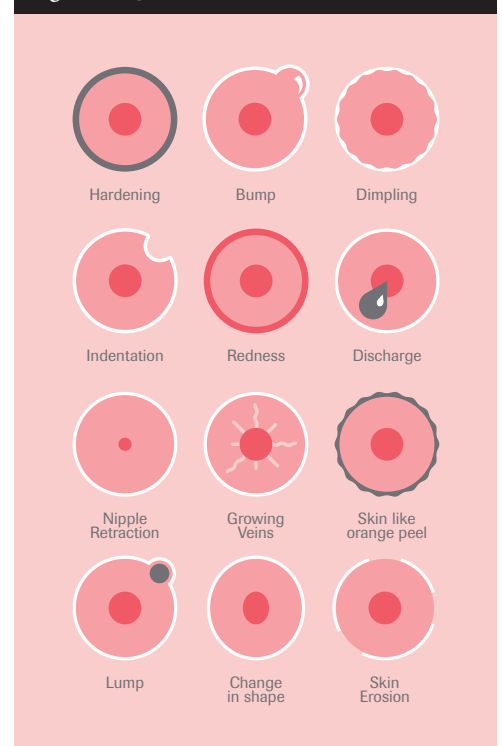
A hard lump developing in the breast or armpit – typically painless and occurring on one side only.

A change in the size or shape of the breast, including indentation, 'growing' (particularly prominent) veins or skin erosion.

Changes in the skin such as hardening, dimpling, bumps, redness/heat or an orange peel like appearance.

Changes in the nipple such as retraction, the secretion of unusual discharge or a rash around the nipple area.

Figure 2 Signs of breast cancer



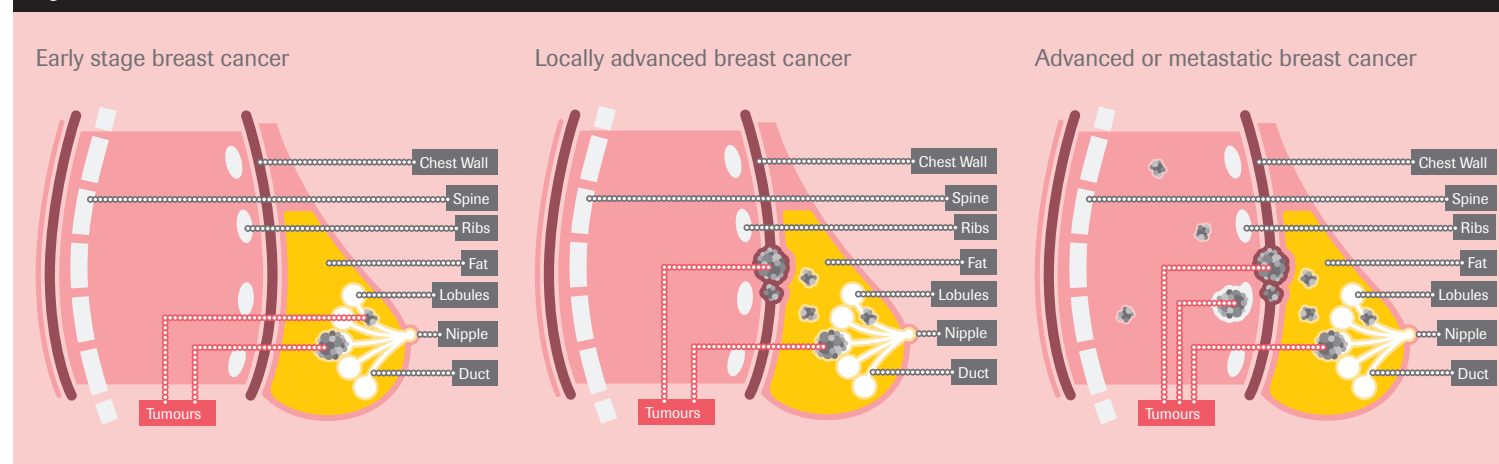
## V. Staging

In simple terms the stage of a cancer describes the size of the tumour and determines whether it has spread and how far it has spread. The stage is important because it helps cancer specialists to decide on the best treatment option.

Adjacent is a simplified description of a staging system for breast cancer.<sup>9</sup>

Stage	Classification
Stage I	The tumour is no larger than two centimeters, and has not spread to the lymph nodes
Stage II	The tumour is around five centimeters in size and may have spread to the lymph nodes under the arm
Stage III	The tumour(s) may have spread to lymph nodes, be clumped together or sticking to other structures. The tumour(s) may have also spread to surrounding breast tissue
Stage IV	Tumour(s) that have spread to other organs in the body e.g. lungs, liver or bone. This is sometimes referred to as 'invasive cancer'

Figure 3 Illustration of breast cancer staging



There are three main stages of breast cancer:

**Early stage**, which refers to cancer that is confined to the fatty tissue of the breast.

**Locally advanced**, which has spread to underlying tissue of the chest wall.

**Advanced or metastatic**, where the tumour has spread to other parts of the body. Approximately one third of breast cancer cases are diagnosed after the cancer has spread beyond the primary tumour site (metastasised).<sup>4</sup>

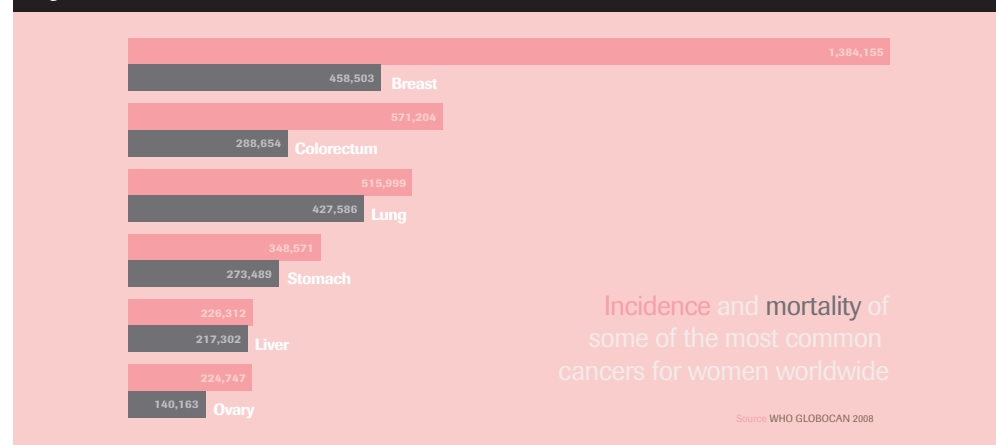
# Section 2 Epidemiology

## i. Incidence and mortality

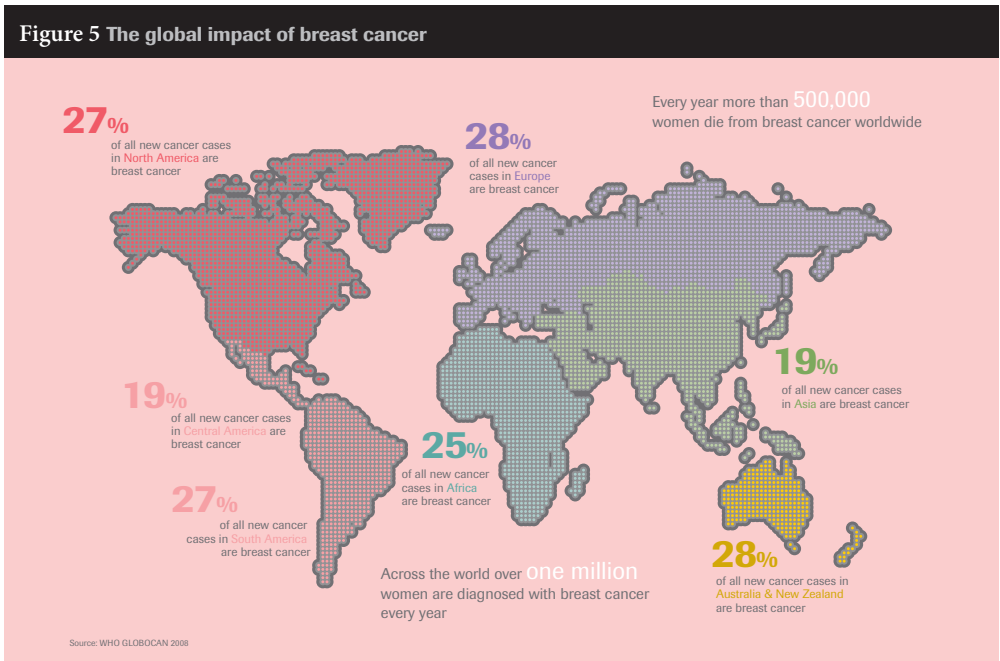
**Worldwide:** Globally, over one million women are diagnosed with breast cancer every year.<sup>1</sup> It is the most frequently diagnosed cancer in women<sup>1</sup> and the leading cause of cancer death in women.<sup>2</sup> Every year more than 500,000 women die from the disease.<sup>2</sup>

**Europe:** In Europe over 400,000 women are diagnosed with breast cancer every year and 120,000 women die from the disease. Breast cancer is the most frequently diagnosed cancer in Europe and the leading cause of cancer death in European women.<sup>10</sup> It accounts for 17% of female cancer deaths in this region.<sup>10</sup>

Figure 4 Incidence and mortality of some of the most common cancers worldwide



Incidence and mortality of some of the most common cancers for women worldwide



**North America:** Over 200,000 women are diagnosed with breast cancer every year in North America.<sup>11</sup> Breast cancer is the second most deadly form of cancer in

North American women after lung; it kills over 45,000 women a year,<sup>11</sup> representing almost 15% of female cancer deaths in North America.

### ii. Lifetime risk of breast cancer

On average one in eight women will develop breast cancer in their lifetime. This is double the risk of developing lung cancer, the second most common cancer in women.<sup>12, 13</sup>

Figure 6 Lifetime risk of common female cancers

On average one in eight women will develop breast cancer at some time in their lives



Breast Cancer



Lung Cancer



Ovarian Cancer

This is compared to a risk of 1 in 16 of developing lung cancer and 1 in 71 of developing ovarian cancer

Source: American Cancer Society

### iii. Prognosis

Cancer statistics often use an ‘overall 5 year survival rate’ to give a better idea of the longer term outlook for people with a particular cancer. It is almost impossible to predict how long an individual patient might live, but 5 year survival rates can give an approximate range. The 5 year survival rate describes on average the ‘amount’ of people that will be alive 5 years after diagnosis. The average 5 year survival rate for women with early stage breast cancer is 81%.<sup>3</sup> However, on average only 35% of women with late or advanced stage breast cancer currently survive for 5 years.<sup>3</sup>

Figure 7 Five year survival rates for breast cancer by stage



The average five year survival rate for early stage breast cancer is 81%

The average five year survival rate for later or advanced stage breast cancer is 35%

Source: American Cancer Society. These numbers come from the National Cancer Data Base, and are based on people who were diagnosed with breast cancer in 2001 and 2002. Early stage disease was assumed to include stages 0-IIIa; later or advanced stage disease was assumed to include stages IIIb-IV.



# Section 3

## Treatment

Breast cancer treatment options vary depending on the stage of the cancer – its size, position, whether it has spread to other parts of the body and the physical health of the patient. Current treatments for breast cancer include surgery, radiotherapy, chemotherapy, hormonal and targeted therapies. These therapies may be used alone or in combination depending on the stage of the disease.

### i. Surgery

This is the main treatment option for patients whose breast cancer has not spread to other parts of the body and is also an option for more advanced stages of the disease. The types of breast cancer surgery differ in the amount of tissue that is removed with the tumour; this depends on the tumour's characteristics, whether it has spread, and the patient's personal feelings.<sup>14</sup>

Some of the most common types of surgery include:

Breast conserving therapy or 'Lumpectomy' which involves the removal of the cancerous area, the surrounding tissue and in some cases the lymph node, whilst aiming to maintain a normal breast appearance after surgery.

'Partial Mastectomy' or 'Quadrantectomy'; this is where a larger portion of tissue is removed (compared with Lumpectomy).

'Total Mastectomy', which is performed in an attempt to further cancer prevention. This surgery involves the removal of the entire breast, without the removal of lymph nodes.<sup>12</sup>

Surgery can also be followed or preceded by radiotherapy and/or chemotherapy, either sequentially or in combination.

### ii. Radiotherapy

Therapy with radiation is often used in addition to surgery and chemotherapy to reduce the chances of the cancer recurring.

It can be given after surgery (known as adjuvant treatment) or in conjunction with chemotherapy prior to surgery (neoadjuvant therapy) to shrink the tumour. Radiotherapy can also be used without surgery in patients with advanced metastatic breast cancer to help alleviate symptoms.

### iii. Chemotherapy

Chemotherapy may be given prior to surgery (neo-adjuvant) with the aim of reducing tumour size and the need for extensive surgery, or after surgery (adjuvant) to reduce the chances of the cancer coming back. When the cancer has spread to other parts of the body (metastatic), chemotherapy may be used to reduce symptoms, improve quality of life and extend survival. Chemotherapy drugs can be given intravenously (directly into the blood), or orally in a tablet. Chemotherapy is typically associated with adverse side effects such as fatigue, nausea and diarrhea; this is because of its toxic nature and non-specific mode of action, which means that all cells are attacked (even healthy cells).

### iv. Hormonal therapy

Medicines that block or inhibit the actions of the hormones oestrogen and progesterone are often used in the treatment of patients with Hormone Receptor-Positive breast cancer.

### v. Targeted therapy

Targeted therapies (also called biological therapies) are a relatively new approach to cancer treatment and target specific biological processes that are often essential to tumour growth. Targeted therapy can include use of monoclonal antibodies, vaccines and gene therapies. Targeted therapies precisely target cancer-specific processes, making them effective and less toxic to non-cancerous, healthy cells.<sup>15</sup> Several types of targeted therapy exist for the treatment of advanced breast cancer. These are either given just after chemotherapy as maintenance or in conjunction with other therapies e.g. chemotherapies or hormonal therapies at various stages of advanced disease in accordance with their approved label.

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