

Chapter 2

Disparities in Cancer Outcomes: A UK Perspective

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It is the cry of men who feel themselves the victims of blind economic forces beyond their control. . . The feeling of despair and hopelessness that pervades people who feel with justification that they have no real say in shaping or determining their own destinies (Reid 1972).

Abstract The social problem described by Jimmy Reid in 1972 [1] is still prevalent in the UK in the twenty-first century. Many people who are socio-economically disadvantaged do not have the capacity to influence their freedom, and as a consequence, they do not have control over the destiny of their own health. In this chapter we examine how socially disadvantaged people in the UK are at greater risk of poorer outcomes when they have cancer. That is, socio-economic factors determine disparities in cancer outcomes, incidence, mortality, and survival rates, in the UK.

Keywords The UK • Cancer incidence • Health inequalities • Black report • Acheson report • Marmot review • National Health Service cancer plan • Carstairs deprivation index • Socio-economic status • Inverse care law

Preface

While the focus of this book is Energy Balance and its relation to cancer disparities, this chapter takes a broader look at health inequalities and cancer with a UK perspective; it draws on UK and international research and policy work spanning the last 30 years and more. Energy balance is a key factor in cancer outcomes; the

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UK has a rich literature on health inequalities, and we hope that by examining the multiple contributing factors to cancer outcome disparities, the role of energy balance can be better understood. We have considered “health inequalities” to be synonymous with “disparities” (a term that is more commonly used in the USA). Several UK Governments have commissioned significant documents over the last few decades and these form the principle overview and understanding of health inequalities in the UK. The first of these was the Black Report [2], commissioned in the late 1970s. This illustrated extensive health inequalities in the UK, despite the advent of the National Health Service in 1948. Similarly, two decades later the Acheson Report [3] reported a relationship between health disparities and social class, with the higher social classes having greater decline in mortality than the rest of the population. These landmark reports have added to our understanding of how health inequalities arise from social inequalities.

A more recent report, the Marmot Review [4] noted that health inequalities are a profound social justice issue for the UK; highlighting how there is a social gradient in health and health inequalities, and concluding that addressing health inequalities is a matter of fairness. The Marmot Review also noted that, based on deprivation categories (a score constructed around communities access to resources, relationships in society, income, housing, and employment), people from more deprived backgrounds not only have a higher rate of cancer, but men from the most deprived category have nearly double the risk of cancer than men from the least deprived background. This is a powerful example of the relationship between cancer mortality and level of deprivation.

Alongside these reports on health inequalities, there has been a policy drive to improve cancer outcomes. This was initially formalised in the NHS Cancer Plan in 2000 [5] and the Cancer Reform Strategy in 2007 [6]. These set in place a national cancer programme for England with a focus on saving more lives to ensure that people with cancer got the right support, care, and treatments; that inequalities in health and cancer were tackled; to invest in strong research; and to prepare for the genetics revolution.

Incidence, Mortality, and Survival

Before we examine health inequalities in cancer outcomes, it is necessary to understand the epidemiology of cancer outcomes. The outcomes we are interested in are the rates of newly diagnosed cancers (incidence), the numbers of people dying from cancer (mortality), and the survival rates for people living with a cancer. The data reported in this section have been largely produced by Cancer Research UK, a highly reputable source of cancer statistics in the UK, who make cancer data available on their website (www.cancerresearchuk.org) [6]. Unless otherwise stated, figures below have been obtained from this source.

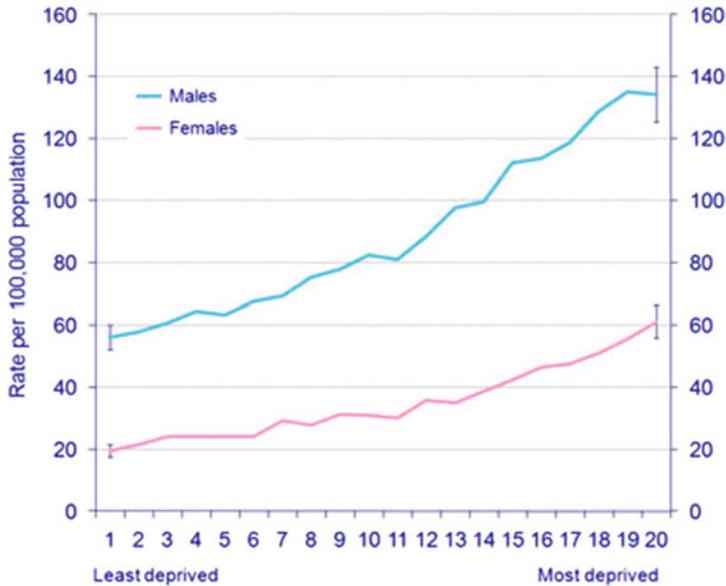


Fig. 2.1 Lung cancer (C33-C34), age-standardised incidence rates by deprivation category, England and Wales, 1993

Incidence of Cancer in the UK

In the UK in 2010, around 325,000 people were newly diagnosed with a cancer. This included a similar number of males and females, around 160,000 each. However when the rates were standardised for age, considerably more men (426 per 100,000) compared to women (374 per 100,000) were newly diagnosed. The incidence of cancer in the UK has steadily risen for men and women since the mid-1970s by 22 %. However, the rate of increase has slowed down from the period 2001–2010, with just a 2 % increase for men and a 6 % increase for women.

Data from 1993 for the incidence of lung cancer showed clear evidence of the impact of deprivation. Two and a half times as many men and three times as many women from the most deprived groups compared to the least deprived groups were diagnosed with lung cancer. Figure 2.1 below shows how the age standardised rates of lung cancer increase across deprivation categories. Although these data are old, more recent work confirms no change [8].

Four types of cancer: breast, lung, bowel, and prostate, accounted for 54 % of all new cases of cancer in 2010. The most commonly diagnosed cancer in men is prostate—one in four cases. The more commonly diagnosed cancer in women is of the breast—just under one in three cases.

Worldwide there were approximately 12.7 million new cases of cancer in 2008. The rate was considerably greater for North America and Europe compared to the developing world (Cancer Research UK).

Scotland has the worse rates of cancer in the UK; reflecting the all-cause mortality gap between Scotland and England which grew from 1981 to 2001 [9]. This is not necessarily determined by social inequalities; the Carstairs deprivation index (a measure of deprivation), declined during the same period [10]. Other factors, such as the “Scottish Effect” (a factor related to living in Scotland, independent of other risk factors) have been proposed to explain poor outcomes in Scotland [11, 12].

Mortality from Cancer in the UK

Around 82,000 men and 75,000 women in the UK died from a cancer between 2007 and 2009, i.e. 427 per 100,000 men, and 371 per 100,000 women [13]. The 157,000 people who died from a cancer in the UK in 2010 accounted for more than one in four (28 %) of all deaths. The most common cause of cancer mortality was due to lung cancer 19,410 cases (24 %) in men; and 15,449 cases (21 %) in women. Death from a cancer becomes more likely with age and is more common for men than women.

In recent years in the UK, more men than women have been newly diagnosed with a cancer. However, overall the rates of newly diagnosed cancers have been falling. More men than women die from a cancer each year in the UK. Deaths from cancer accounted for more than one quarter of all deaths in the UK in 2010. Lung cancer was the most common cause of a cancer death in both men and women. More people are now dying from cancer of the liver than in previous decades.

Mortality rates from cancer have been declining in the UK since the early 1990s. Between 2001 and 2008, there was a 12 % and 9 % decrease in all cancers for men and women respectively. However the rates of cancer mortality from liver cancer have increased in both sexes, which may be due to trends in increased alcohol intake. While deaths from lung cancer have decreased for men by 19 % they have increased for women by 6 % (Cancer Research UK).

Surviving Cancer

Coleman et al. [14] analysed data from population-based cancer registries in six countries for two to four million adults diagnosed with a cancer during 1995–2007 and found survival rates were lower in the UK (and Denmark) than in Australia, Canada, and Sweden.

Rachet et al. [15] have found survival rates for patients with cancer was significantly higher in the most affluent groups compared to the most deprived groups. However, the relationship is complex, due to the interplay between the type of cancer, patient personal factors, and the role of the health service [16].

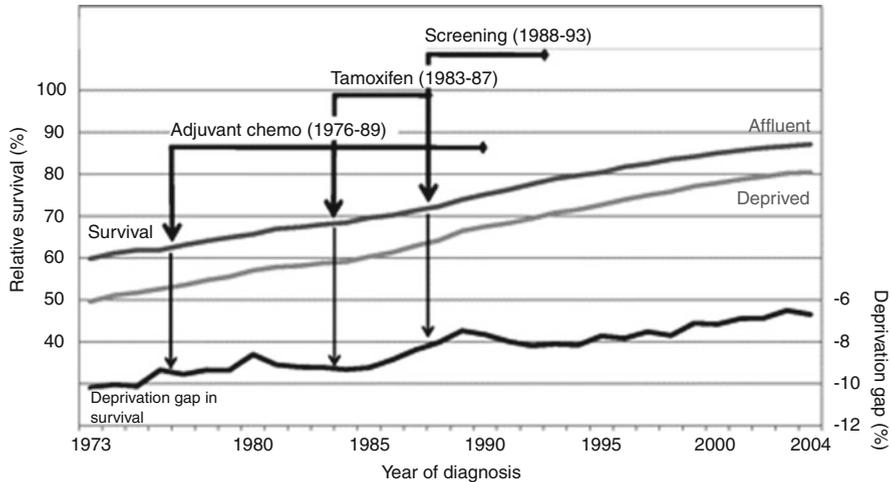


Fig. 2.2 Trends in 5-year relative survival (%) from breast cancer in women in the most affluent and most deprived groups and deprivation gap (%) in survival: 5-year moving average values, England and Wales, 1973–2004. Periods of emergence of evidence about the efficacy of new interventions are denoted on the graph [Reproduced with permission]

Trends in survival differences, by deprivation category, are also complex; Lyrtzopoulos and colleagues [17] examined changes in socio-economic inequalities in survival from breast cancer for women, and from rectal cancer for men in England and Wales from 1973 to 2004. They found survival rates increased over this period from 55 % to 85 % for women with breast cancer, while the survival gap between the two deprivation groups narrowed slightly from -10 % to -6 % (Fig. 2.2). For men they found 5-year relative survival rates from rectal cancer improved from 29 % to 53 % between 1973 and 2004; but the survival gap between the two deprivation groups increased from -5 % to -11 % (Fig. 2.3).

These authors conclude that the cause of inequalities in survival rates remains unknown, but may partly reflect differences in clinical management (the “health care factors” hypotheses). If so, socio-economic inequalities should be largely determined by socio-economic differences in the quality of treatment received, with deprived patients more often managed suboptimally.

Coleman et al. [18] clearly highlighted the link between socio-economic disadvantage and poorer cancer outcomes, finding a difference in 1 and 5 year survival rates for all cancers combined when comparing people from deprivation categories between 1986 and 1990. People from the more affluent groups had higher survival rates after diagnosis than people from the most deprived category. The difference remained fairly stable between 1 and 5 year survival; 12.7 % and 11.1 % respectively. Figure 2.4 shows this gap in survival rates.

In a related study, Abdel-Rahman et al. [19] found that compared with data from countries in continental Europe, socio-economic differences in survival in Britain may account for half the avoidable premature mortality from cancers.

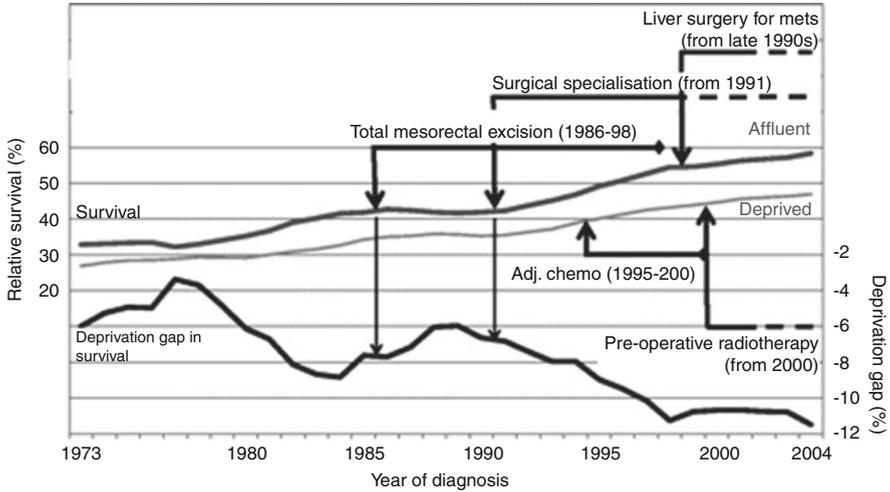


Fig. 2.3 Trends in 5-year relative survival (%) from rectal cancer in men in the most affluent and most deprived groups and deprivation gap (%) in survival: 5-year moving average values, England and Wales, 1973–2004. Periods of emergence of evidence about the efficacy of new interventions are denoted on the graph. Increasing use of flexible sigmoidoscopy occurred throughout the study period, and is not denoted on the graph [Reproduced with permission]

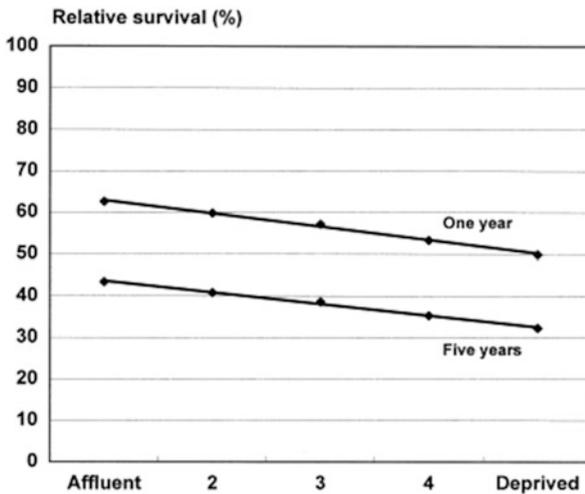


Fig. 2.4 Relative survival rates 1 and 5 years after diagnosis by deprivation category, all cancers combined: England and Wales, adults diagnosed 1986–1990

Explaining Disparities in Health Outcomes

It is estimated that only 5–10 % of cancers are attributable to genetic variation [20]. If this is the case, then most cancers might be preventable if people avoid specific environmental risks, or practise health promoting behaviours. It is thought that about half of all cases of cancer could be prevented by lifestyle changes [21]. This indicates how social and behavioural factors, e.g. gender, ethnic group, income, geographical, education, and social class, are important determinants of cancer.

The Black Report

The Black Report [2] has played a fundamental role in explaining health-care disparities in the UK. It examined four ways to understand health inequalities; they remain a useful framework in understanding disparities in people’s cancer outcomes.¹

1. **Artifact:** This argument proposes that a relationship between class and health is spurious; that there is no real relationship and that the findings are a product of the way the data were measured. Macintyre [22] suggests this relationship is not straightforward because the level of class influence on illness will depend on how both class and illness are measured. A failing of this hypothesis is that evidence of health inequalities are consistent across populations and periods of time [23], which suggests the finding reflects reality and is not a social construct.
2. **Social selection:** This model proposes that health determines class [22]; thus health inequalities are thought to produce health-related social inequalities; that is, for example, people with illness tend to suffer downward social mobility from loss of employment and/or income. This is also known as the “reverse causation” or “drift” hypothesis [24]. At best, this model can only partially explain health disparities. For example the link between cancers and education cannot be accounted for by social selection because people have usually completed their education in early adulthood before succumbing to a cancer [24]. There is little evidence to support this theory and it does not have widespread support in the international literature [25].
3. **Cultural/behavioural:** This model proposes that health damaging behaviours (e.g. smoking, excessive alcohol intake, or poor diet) are more common among the socially disadvantaged. The more extreme version of this argument suggests that individual ignorance, lifestyle choices, and neglect are the cause of illness [26]. Individuals from lower socio-economic status (SES) groups are also

¹ Macintyre [22] noted that each explanation has a “hard” (extreme) and “soft” (moderate) version for explaining the relationship between social class and health.

more likely to be exposed involuntarily to environmental pollutants [27] and occupational hazards [28]; factors which put them at high risk of developing a cancer. This argument however ignores the social context of people's lives and can be said to blame the victims of health inequalities for their poor health, although this argument in itself does not discredit this model. Critics have said that little has been done to disentangle the relationship between social disadvantage and health damaging behaviour [25]. We know there is a relation, but we are unclear why this is.

4. **Material/structural:** This proposal suggests that health is determined by a person's wealth—at its simplest, whether a person is “rich” or “poor”. One such explanation proposes that health status is determined by income inequality; in particular that negative exposure and lack of resources combine to produce health inequalities [29]. A softer version acknowledges that psychosocial and other influences mediate this relationship. Coleman et al. [30] spoke of a “deprivation gap”, e.g. the deficit in a cancer outcome between the rich and the poor.

There is clear and considerable evidence showing socio-economically disadvantaged people have significant health problems and poor access to health care. For example there is a gradient in the relationship between class and mortality: as a whole, people from lower classes have a lower life expectancy and die earlier than people from more affluent backgrounds. As we will later show, there is much evidence showing cancer incidence, mortality, and survival are related to social class. The material/structural argument helps explain national and international health disparity at a population level, but it remains a challenge to understand how socio-structural factors influence health inequalities [25], and at an individual level.

SES, Cancer and Pathways

The models discussed in “Incidence of Cancer in the UK” offer generic explanations of health inequalities. Kawachi and Kroenke [24] have sought to explain the mechanism linking SES and cancer by means of two possible pathways. In the first pathway, people from higher SES groups are able to access various resources to help prevent them developing cancer, or improving their outcome following cancer onset. They give the example of people who, through better education, are more “health literate” and consequently better able to understand options for cancer treatments. The second pathway suggests that people with higher SES have a differential exposure to psychosocial mediators (compared to people from poorer backgrounds), which benefits their health outcomes (see below for further details).

Examples of Disparities

Disparities are observed across a range of categories:

- Gender disparity: women have a longer life expectancy than men [31].
- Ethnic group disparity: there is a higher rate of cardiovascular disease in the UK amongst people from South Asia [32].
- Income disparity: people with higher levels of income tend to have better health overall than people with lower incomes [33].
- Geographic disparity: the Scottish city of Glasgow has nearly half of the 10 % most health deprived areas in Scotland [34]. These areas have higher rates of morbidity and mortality than more affluent areas in the same city and elsewhere.
- Education disparity: people with better education opportunities tend to have better health and well-being than people who have not had the same level of education [35].
- Social class disparity: people from lower social classes tend to have poorer health, and receive poorer health care than people from higher social classes [33].

It is important to recognise that individuals can face inequality across a number of these categories.

The Impact of Socio-economic Disadvantage on Cancer Outcomes

Having explored rates of people living with, surviving, and dying from cancer; and examined how socio-economic disadvantage impacts on people's health and access to health care in general; we now examine the evidence that socio-economic disparities impact on cancer outcomes. We consider lifestyle factors, public perception of cancer, issues related to cancer screening, awareness and recognition of cancer, health-care factors, and psychosocial factors.

Lifestyle Risk Factors

People who are socio-economically disadvantaged are often at greater risk of exposure to lifestyle risk factors than people from more affluent backgrounds. This may be seen to reflect a cultural/behavioural explanation for cancer inequalities. Lifestyle is intricately woven with socio-economic conditions and so it does not solely reflect someone's "choices".

1. Tobacco smoking: Smoking is an unequivocal risk factor for cancer and other diseases. For example it is considered to be the main determinant of lung cancer, with 90 % of people with lung cancer having smoked [24]. Smoking is the main cause of difference in morbidity and mortality between wealthy and poor individuals [36]. Accordingly, tackling smoking among people from the lowest socio-economic groups might reduce the incidence of smoking-related cancers and other smoking-related diseases. Much has been done in recent times in the UK to encourage and support people to stop smoking. The Scottish Government banned smoking in public places in 2006, with the rest of the UK doing so a year later. The National Health Service in the UK also runs a “Smokefree” service which offers people who want to stop smoking support via telephone, the Internet, and paper-based materials. However poorer people have less success in stopping smoking than more affluent people [37]. Therefore smoking related health inequalities will likely continue.
2. Poor diet: Poor diet has been linked to around one third of cancer deaths [21]. Diets rich in fats and red meat, high in calories and low in vegetables, are commonly related to lower SES [24]. Diets that have greater amounts of fruit and vegetables are more often consumed by people from an affluent background [38]. People from lower socio-economic backgrounds are at further disadvantage because of the link between the availability and cost of food [39].
3. Physical activity: Minimal physical activity is related to the risk of several cancers [40], as well as obesity. Recreational physical activity tends to be strongly correlated with higher income households [41]. This is related to lower levels of obesity linked cancers [24]. The affordability and accessibility of recreational physical activity may be beyond many people from poorer backgrounds.
4. Weight and obesity: As expressed in other chapters of this book, there are major disparities in levels of obesity, between different social classes [42]. Given the growing body of evidence linking overweight and obesity with unfavourable cancer outcomes [43], poor dietary and energy balance trends in the UK must play a significant role in cancer disparities. It is suggested that if individuals maintained a healthy body weight, up to 12,000 cases of cancer could be prevented (Cancer Research UK; Cancer and Health Inequalities: an introduction to current evidence). People from lower socio-economic backgrounds, because they are more likely to be obese, are disadvantaged and so at greater risk of acquiring a cancer. Being obese increases the risk of several cancers, including cancer of the uterus, kidney, or colon [44]. Obesity levels in the UK have trebled over the last 20 years [21], indicating that this is a recent risk factor.
5. Alcohol consumption: Excessive alcohol intake is related to various diseases, including liver disease, heart disease, stroke, and cancers of the liver and the head and neck [21]. While the evidence of a link between alcohol and illnesses is clear, there is no conclusive evidence that people from a disadvantaged background are more at risk of misusing alcohol. It is thought in the UK that this is because excessive alcohol intake has no class pattern—in contrast to smoking [21].

Public Perceptions of Cancer

People's perceptions of cancer are probably relevant in their decisions to take screening tests for cancer in the absence of symptoms of cancer, or to attend for care when they develop symptoms. Dein [45] noted that beliefs about cancer can determine the perception of risk of developing cancer, and therefore have implications for the perceived urgency for patients to participate in screening, their decisions about treatment, and emotional responses to the disease.

It is not only the perception of someone's risk of cancer that can impact on their outcome, but their opinion of the likelihood that treatment would be successful [46]. For example, Powe & Finnie [47] have spoken of "Cancer Fatalism", where death from cancer is considered inevitable. This can be seen to reflect the observation by Susan Sontag [48] that some people held the belief that "cancer equals death". It is not difficult to see that if someone perceived this, she/he may not appreciate an urgency or benefit from early diagnosis and treatment, because they would not perceive any benefits from this.

Screening for Cancer

There are three national screening campaigns in the UK: for breast, bowel, and cervical cancer. These are available through the National Health Service, which is funded by taxation and so the tests are free to everyone. While there is no economic barrier to their uptake, other factors intervene for each cancer screened.

There are socio-economic differences in who is screened, with poorer people less likely to take up screening. Moser et al. [49] found a correlation between "indicators of wealth" (e.g. an owner occupied house, or a household with a car), and women having had breast screening. Women, who lived in a bought house or lived in a household with one or more cars, were more likely to have had a mammogram than women living in rented accommodation and not having a car. Reduced uptake of cervical screening has also been found among lower socio-economic groups [50]. Moss et al. [51] found people from lower SES less often took up the opportunity for bowel cancer screening compared to people from higher SES, despite it being free at the point of access. They proposed that great effort would be necessary to avoid significant disparities in screening uptake between deprived and wealthy people.

Despite the best efforts of national screening programmes to promote equitable uptake of screening, significant inequalities exist across all the programmes; the reasons for this are complex [51], and resistant to interventions. Consequently, cancer screening has the potential to enhance disparities in cancer outcome.

Awareness and Recognition of Cancer

There is a great deal of interest in the UK in awareness and recognition of cancer by patients and family doctors. In countries with strong primary health-care systems, such as the UK, family practice is typically the first point of contact for the majority of patients. In order for timely diagnosis to take place people need to recognise that their symptoms may be serious and so worthy of contacting a doctor, and then the doctor needs to recognise these symptoms as potential cancer symptoms [53].

If people do not present as early as possible with cancer symptoms, an opportunity may be lost to diagnose and treat the cancer early (and, potentially, improve survival). A link between prolonged diagnostic intervals and deprivation is challenging to prove; although we know that there are differences in stage of diagnosis for many cancers, based on whether someone is from a deprived or better-off background, [54] this may not be because there was any delay in presenting with symptoms. Rather, the nature of the illness may be such that the symptoms duration was short. There is, nevertheless, a policy drive in the UK to seek to ensure that patients recognise symptoms as early as possible and for practitioners to refer appropriately [55].

Systematic reviews of the evidence have been carried out to seek to understand the factors associated with timely recognition of cancer by patients and family doctors [53]. These reviews have concluded that, for many cancers, non-recognition of symptom seriousness is the main patient-related factor resulting in increased time to presentation. There is strong evidence of an association between older age and patient delay for breast cancer, between lower SES and delay for upper gastrointestinal and urological cancers and between lower education level and delay for breast and colorectal cancers [53]. Fear of cancer is a contributor to delayed presentation, while sanctioning of help seeking by others can be a powerful mediator of reduced time to presentation [53].

These findings have resulted in an interest in awareness of cancer, even though it is clear that awareness is insufficient in and of itself. The evidence does, however, suggest that many people appear to have very limited knowledge about cancers. This may be based on how they are asked about cancers. For example, a study examined the awareness of cancer of patients from both an affluent residential and deprived inner-city area in the same city in the North of England, and found that people had very poor open recall, but better prompted recognition [56].

On the whole people tend to have poor awareness about the warning signs of cancer for all symptoms (except lumps and swelling). Robb et al. [57] asked people to freely recall and then to recognise a set of cancer symptoms, and found recognition, which studies of memory have shown to be a more effective means of retrieval of information, was much higher for cancer symptoms, e.g. mole, lump, or swelling, than free recall. This was a general finding across the population: in particular men, younger people, people from an ethnic minority, and people from the lower end of the socio-economic spectrum had poorer awareness.

Further, it appears that people from ethnic minorities, who are often amongst the most socially disadvantaged, have poor awareness of the warning signs for cancers [58]—these authors suggest poor understanding of English may be a contributing factor, as people from ethnic minorities in the UK have higher levels of deprivation.

Evidence on cancer disparities has prompted considerable policy interest and activity regarding early detection of cancer. In England, a key programme is the National Awareness and Early Diagnosis Initiative (NAEDI) [55]; in Scotland there is a similar initiative—the Detect Cancer Early programme. Both these programmes seek to join up expertise from the NHS, the academic sector and the NHS in order to improve cancer survival outcomes (The Scottish Government. Detect cancer early. <http://www.scotland.gov.uk/Topics/Health/Services/Cancer/Detect-Cancer-Early>; accessed Sept 2013) [59].

Health Service Factors

So far, we have shown how a person's cancer outcomes are disadvantaged by socio-economic factors. However, the patient can also be disadvantaged through poor provision and/or poor quality of health services. Julian Tudor Hart [60] proposed the Inverse Care Law; this states that the accessibility of good medical care is inclined to vary inversely with the need for it by the population. Thus, people with cancer from poorer backgrounds may be disadvantaged by the poor availability of good quality care as much as by their own personal circumstances.

The first important health service factor is the response of the family doctor when a patient presents himself/herself with a new symptom. The evidence for factors associated with delay by family doctors is mixed [53]. In family practice many patients present with symptoms that may be indicative of cancer, but diagnostic tests later exclude cancer. On the other hand, family doctors assigning a diagnosis other than cancer to a set of symptoms can introduce delay in the pathway to referral [53].

Some work has also considered whether patients from poorer regions experience different care once diagnosed with cancer than those from better neighbourhoods and in general this has been found not to be the case [61]. However the presence of other coexisting illnesses occurring more commonly in socio-economically deprived patients may in part explain the poorer outcomes.

An individual with cancer receives care across several stages, from when they first present with their symptoms to a health-care professional, through living with cancer and then either surviving or dying from cancer. Lewis et al. [62] noted how SES impacts on four dimensions of access to palliative care: its availability, affordability, accessibility, and acceptability. Broadly speaking, palliative care is less available to people from the lower social classes and is less affordable for them; they have less access to it, and they are less accepting of it.

While care is free at the point of delivery to all in the UK, differences in care remain. Raine et al. [63] found patients from deprived areas, older people, and

women were more likely to be admitted as emergencies for their cancer. People living in deprived areas and males were less likely to receive their preferred surgical procedures for cancers. They also found that older people were more likely to receive their preferred surgical procedure for rectal cancer but less likely to receive breast conserving surgery and lung cancer resection.

Psychosocial Factors

As we have shown, the evidence points to people from poor backgrounds being differentially exposed to environmental stressors compared to people from more affluent backgrounds. This adversely affects their health outcomes in general. White and Macleod [64] have noted three psychological consequences from having cancer: the patient can experience depression; the patient can feel anxiety, fear, and panic; or if the patient has a cancer that spreads to the brain, she/he can suffer neuropsychiatric problems.

A follow-up study of women with breast cancer showed that affluent women were more likely to have received information from their hospital specialist and from a breast care nurse than deprived women, but deprived women had poorer SF-36 scores (Short-Form 36, self-reported survey of health status) than affluent women, and reported greater anxiety about money, other health problems, and family problems [65]. In a recent study of cancer survivors in England, individuals from most socio-economically deprived areas reported lower quality-of-life scores [66].

Conclusion

People with cancer from disadvantaged socio-economic backgrounds have poorer health in general, poor access to health care, and poorer outcomes. The reasons for this are undoubtedly multifactorial; in this chapter we have emphasised that the relationship between inequalities and cancer is complex and probably not unidirectional. People from lower SES groups may be in a poorer position to cope with hardship resulting from living with cancer, while people from a more affluent background will have the resources and knowledge to cope with cancer. In other words, understanding context is key.

Because socio-economic inequalities can determine people's health in general and particularly for cancer, people from poorer backgrounds do not always have access to the same quality of care as more affluent people. Reflecting Wilkinson and Pickett [67] we argue that political efforts need to be made to rebalance social and health inequalities. Heath [68] has likewise argued the need to confront causes of health inequalities. Reducing disparities is difficult; there was hope that the NHS Cancer Plan [5], with a number of measures focused on deprived sectors of the

population, would improve cancer survival rates and reduce disparities. While it resulted in a decrease in the deprivation gap for cancer outcomes at 1 year, this was not maintained, and the reason for this is unclear [15]. It may be that changes enacted around this time needed longer to impact on morbidity and mortality from a cancer. Or perhaps social class (and resultant social inequalities) are so well entrenched within society and so less responsive to policy initiatives.

The problem of health inequalities was recognised in 1997 by the UK Secretary of State for Health Frank Dobson, He stated that:

Inequality in health is the worst inequality of all. There is no more serious inequality than knowing that you'll die sooner because you're badly off. (Dobson and Department of Health 1997) [69].

Health inequalities prevail in the UK and have a significant impact on people with a cancer. To ensure that everyone has the best possible outcome from a cancer, regardless of whether they are affluent or poor, will probably require great effort at a national policy level.

References

1. Reid J (1972) Alienation: rectoral address. University of Glasgow Publications, Glasgow
2. Department of Health and Social Security (1980) Inequalities in health: report of a working group chaired by Sir Douglas Black. DHSS, London
3. Acheson D (1998) Independent inquiry into inequalities in health. Stationery Office, London
4. Marmot M (2010) Strategic review of health inequalities in England post-2010. Marmot review final report, University College London. <http://www.instituteofhealthequity.org/>
5. Department of Health (2000) The NHS cancer plan: a plan for investment, a plan for reform. Department of Health, London
6. Department of Health (2007) Cancer reform strategy. Department of Health, London
7. Cancer Research UK. <http://info.cancerresearchuk.org/cancerstats/causes/lifestyle/bodyweight/>. Accessed July 2013
8. Shack L, Jordan C, Thomson CS, Mak V, Moller H (2008) Variation in incidence of breast, lung and cervical cancer and malignant melanoma of skin by socioeconomic group in England. *BMC Cancer* 8:271
9. McCartney G, Shipley M, Hart C, Davey-Smith G, Kivimäki M, Walsh D, Watt GC, Batty GD (2012) Why do males in Scotland die younger than those in England? Evidence from three prospective cohort studies. *PLoS One* 7:e38860. doi:10.1371/journal.pone.0038860
10. Carstairs V, Morris R (1989) Deprivation: explaining differences in mortality between Scotland and England and Wales. *BMJ* 299(6704):886–889
11. Hanlon P, Lawder R, Buchanan D, Redpath A, Walsh D, Wood R et al (2005) Why is mortality higher in Scotland than in England & Wales? Decreasing influence of socioeconomic deprivation between 1981 and 2001 supports the existence of a 'Scottish effect'. *J Public Health* 27:199–204
12. Norman P, Boyle P, Exeter D, Feng Z, Popham F et al (2011) Rising premature mortality in the UK's persistently deprived areas: only a Scottish phenomenon? *Soc Sci Med* 73:1575–1584. doi:10.1016/j.socscimed.2011.09.034
13. Office for National Statistics (2012) Cancer incidence and mortality in the UK, 2007–2009, Statistical Bulletin

14. Coleman MP, Forman D, Bryant H, Butler J, Rachet B, Maringe C et al (2011) Cancer survival in Australia, Canada, Denmark, Norway, Sweden and the UK, 1995–2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. *Lancet* 377(9760):127–138. doi:10.1016/S0140-6736(10)62231-3
15. Rachet B, Ellis L, Maringe C, Chu T, Nur U, Quaresma M et al (2010) Socioeconomic inequalities in cancer survival in England after the NHS cancer plan. *Br J Cancer* 103:446–453. doi:10.1038/sj.bjc.6605752
16. Woods LM, Rachet B, Coleman MP (2006) Origins of socio-economic inequalities in cancer survival: a review. *Ann Oncol* 17:5–19
17. Lyratzopoulos G, Barbieri JM, Rachet B, Baum M, Thompson MR, Coleman MP (2011) Changes over time in socioeconomic inequalities in breast and rectal cancer survival in England and Wales during a 32-year period (1973–2004): the potential role of health care. *Ann Oncol* 22:1661–1666
18. Coleman MP, Babb P, Sloggett A, Quinn M, De Stavola B (2001) Socioeconomic inequalities in cancer survival in England and Wales. *Cancer* 91(1 Suppl):208–216
19. Abdel-Rahman MA, Stockton DL, Rachet B, Hakulinen T, Coleman MP (2009) What if cancer survival in Britain were the same as in Europe: how many deaths are avoidable? *Br J Cancer* 101(Suppl 2):S115–S124. doi:10.1038/sj.bjc.6605401
20. Anand P, Kunnumakara AB, Sundaram C, Harikumar KB, Tharakan ST, Lai OS et al (2008) Cancer is a preventable disease that requires major lifestyle changes. *Pharm Res* 25(9):2097–2116. doi:10.1007/s11095-008-9661-9
21. Gordon-Dseagu V (2006) Cancer and health inequalities: an introduction to current evidence. Cancer Research UK, London
22. Macintyre S (1997) The black report and beyond what are the issues? *Soc Sci Med* 44:723–745
23. Merletti F, Galassi C, Spadea T (2011) The socioeconomic determinants of cancer. *Environ Health* 10(Suppl 1):S7
24. Schottenfeld D, Fraumeni JF, Jr. (2006) Socioeconomic disparities in cancer incidence and mortality. In: David Schottenfeld, Fraumeni JF (eds) *Cancer epidemiology and prevention*. Oxford University Press, Oxford, pp 174–188
25. Asthana S, Halliday J (2006) What works in tackling health inequalities? Pathways, policies and practice through the lifecourse. Policy Press, Bristol
26. Peacock M, Bissell P (2011) The social determinants of health inequalities: implications for research and practice. University of Sheffield and Sheffield Teaching Hospitals NHS Foundation Trust
27. Woodward A, Boffetta P (1997) Environmental exposure, social class, and cancer risk. IARC scientific publications no. 138. International Agency for Research on Cancer, Lyon
28. Buffetta R, Kogevinas M, Westerholm P, Saracci R (1997) Exposure to occupational carcinogens and social class differences in cancer occurrence. IARC scientific publications no. 138. International Agency for Research on Cancer, Lyon
29. Lynch J (2000) Income inequality and health: expanding the debate. *Soc Sci Med* 51:1001–1005, discussion 1009–10
30. Coleman MP, Rachet B, Woods LM, Mitry E, Riga M, Cooper N et al (2004) Trends and socioeconomic inequalities in cancer survival in England and Wales up to 2001. *Br J Cancer* 90:1367–1373
31. Barford A, Dorling D, Davey Smith G, Shaw M (2006) Life expectancy: women now on top everywhere. *BMJ* 332(7545):808
32. Cappuccio FP (1997) Ethnicity and cardiovascular risk: variations in people of African ancestry and South Asian origin. *J Hum Hypertens* 11(9):571–576
33. Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J (1998) Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. *JAMA* 279:1703–1708
34. The Scottish Government (2004) Scottish index of multiple deprivation 2004: summary technical report. <http://www.scotland.gov.uk/Publications/2004/06/19429/38161>

35. Ross CE, Wu C (1995) The links between education and health. *Am Sociol Rev* 60:719–745
36. Jarvis MJ, Wardle J (2006) Social patterning of health behaviours: the case of cigarette smoking. In: Marmot M, Wilkinson RG (eds) *Social determinants of health*. Oxford University Press, Oxford, pp 224–237
37. Jarvis M (2001) The challenge for reducing inequalities: analysis of the General Household Survey 1998 presentation to a Department of Health seminar. January 2001
38. Centers for Disease Control and Prevention (2000) Behavioral risk factor surveillance system: prevalence data: nationwide—2000 nutrition. CDC, Atlanta
39. James WP, Nelson M, Ralph A, Leather S (1997) Socioeconomic determinants of health: the contribution of nutrition to inequalities in health. *BMJ* 24:1545–1549
40. Colditz GA, Cannuscio CC, Frazier AL (1997) Physical activity and reduced risk of colon cancer: implications for prevention. *Cancer Causes Control* 8(4):649–667
41. Department of Health (1998) Health survey for England. Department of Health, London
42. McLaren L (2007) Socioeconomic status and obesity. *Epidemiol Rev* 29:29–48
43. Calle EE, Kaaks R (2004) Overweight, obesity and cancer: epidemiological evidence and proposed mechanisms. *Nat Rev Cancer* 4(8):579–591
44. Reeves GK, Pirie K, Beral V, Green J, Spencer E, Bull D (2007) Cancer incidence and mortality in relation to body mass index in the Million Women Study: cohort study. *BMJ* 335:1134
45. Dein S (2004) Explanatory models of and attitudes towards cancer in different cultures. *Lancet Oncol* 5:119–124
46. Soler-Vila H, Kasl SV, Jones BA (2005) Cancer-specific beliefs and survival: a population-based study of African-American and White breast cancer patients. *Cancer Causes Control* 16:105–114
47. Powe BD, Finnie R (2003) Cancer fatalism: the state of the science. *Cancer Nurs* 26:454–465
48. Sontag S (1978) *Illness as metaphor*. Farrar, Straus & Giroux, New York
49. Moser K, Patnick J, Beral V (2009) Inequalities in reported use of breast and cervical screening in Great Britain: analysis of cross sectional survey data. *BMJ* 338:b2025. doi:[10.1136/bmj.b2025](https://doi.org/10.1136/bmj.b2025)
50. Baker D, Middleton E (2003) Cervical screening and health inequality in England in the 1990s. *J Epidemiol Community Health* 57(6):417–423
51. Moss M, Campbell C, Melia J, Coleman D, Smith S, Parker R et al (2012) Performance measures in three rounds of the English bowel cancer screening pilot. *Gut* 61:101–107. doi:[10.1136/gut.2010.236430](https://doi.org/10.1136/gut.2010.236430)
52. Wardle J, McCaffery K, Nadel M, Atkin W (2004) Socioeconomic differences in cancer screening participation: comparing cognitive and psychosocial explanations. *Soc Sci Med* 59:249–261
53. Macleod U, Mitchell E, Burgess C, Macdonald S, Ramirez AJ (2009) Risk factors for delayed presentation and referral of symptomatic cancer: evidence for common cancers. *Br J Cancer* 101(Suppl 2):S92–S101
54. Lyratzopoulos G, Abel GA, Brown CH, Rous BA, Vernon SA, Roland M et al (2013) Socio-demographic inequalities in stage of cancer diagnosis: evidence from patients with female breast, lung, colon, rectal, prostate, renal, bladder, melanoma, ovarian and endometrial cancer. *Ann Oncol* 24:843–850
55. Richards MA (2009) The national awareness and early diagnosis initiative in England: assembling the evidence. *Br J Cancer* 101:S1–S4. doi:[10.1038/sj.bjc.6605382](https://doi.org/10.1038/sj.bjc.6605382)
56. Adlard JW, Hume MJ (2003) Cancer knowledge of the general public in the United Kingdom: survey in a primary care setting and review of the literature. *Clin Oncol (R Coll Radiol)* 15(4):174–180
57. Robb K, Stubbings S, Ramirez A, Macleod U, Austoker J, Waller J et al (2009) Public awareness of cancer in Britain: a population-based survey of adults. *Br J Cancer* 101(Suppl 2):S18–S23. doi:[10.1038/sj.bjc.6605386](https://doi.org/10.1038/sj.bjc.6605386)

58. Waller J, Robb K, Stubbings S, Ramirez A, Macleod U, Austoker J et al (2009) Awareness of cancer symptoms and anticipated help seeking among ethnic minority groups in England. *Br J Cancer* 101(Suppl 2):S24–S30
59. The Scottish Government. Detect cancer early. <http://www.scotland.gov.uk/Topics/Health/Services/Cancer/Detect-Cancer-Early>. Accessed Sept 2013
60. Hart JT (1971) The inverse care law. *Lancet* 297(7696):405–412
61. Macleod U, Ross S, Twelves C, George WD, Gillis C, Watt GC (2000) Primary and secondary care management of women with early breast cancer from affluent and deprived areas: a retrospective review of hospital and general practice records. *BMJ* 320:1442–1445
62. Lewis JM, DiGiacomo M, Currow DC, Davidson PM (2011) Dying in the margins: understanding palliative care and socioeconomic deprivation in the developed world. *J Pain Symptom Manage* 42:105–118
63. Raine R, Wong W, Scholes S, Ashton C, Obichere A, Ambler G (2010) Social variations in access to hospital care for patients with colorectal, breast, and lung cancer between 1999 and 2006: retrospective analysis of hospital episode statistics. *BMJ* 340:b5479. doi:[10.1136/bmj.b5479](https://doi.org/10.1136/bmj.b5479)
64. White CA, Macleod U (2002) ABC of psychological medicine: cancer. *Br Med J* 325:377–380
65. Macleod U, Ross S, Fallowfield L, Watt GC (2004) Anxiety and support in breast cancer: is this different for affluent and deprived women? A questionnaire study. *Br J Cancer* 91:879–883
66. Glaser AW, Fraser LK, Corner J, Feltbower R, Morris EJ, Hartwell G et al (2013) Patient-reported outcomes of cancer survivors in England 1–5 years after diagnosis: a cross-sectional survey. *BMJ Open* 3(4):e002317. doi:[10.1136/bmjopen-2012-002317](https://doi.org/10.1136/bmjopen-2012-002317)
67. Wilkinson R, Pickett K (2010) *The spirit level: why equality is better for everyone*. Penguin, London
68. Heath F (2007) Let's get tough on the causes of health inequality. *BMJ* 334(7607):1301
69. Dobson F, Department of Health (1997) Government takes action to reduce health inequalities. Press release in response to the Joseph Rowntree publication *Death in Britain*. DoH press release 97/192 11 August



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