Comparing Total Neoplasms, Breast & Prostate Cancer Mortality Rates of the UK and 20 Major Developed Countries 1989-91 v 2013-15 - Identifying Progress

Colin Pritchard¹*, Brian Birch², Tamish Hickish³, Emily Rosenorn-Lanng⁴

¹Research Professor, Faculty of Health and Social Sciences, Bournemouth University, Poole, United Kingdom
²Consultant Urologist, School of Medicine, University of Southampton, Southampton, United Kingdom
³Consultant Oncologist, Faculty of Health and Social Sciences, Bournemouth University, Poole, United Kingdom
⁴Statistician, Faculty of Health and Social Sciences, Bournemouth University, Poole, United Kingdom

*Corresponding author: Colin Pritchard, Research Professor, Faculty of Social Sciences, Bournemouth University, Royal London House, Christchurch Rd, Bournemouth BH13LT, Poole, UK. Email: cpritchard@bournemouth.ac.uk

Received: 15 January 2021; Accepted: 25 January 2021; Published: 29 January 2021

Citation: Colin Pritchard, Brian Birch, Tamish Hickish, Emily Rosenorn-Lanng. Comparing Total Neoplasms, Breast & Prostate Cancer Mortality Rates of the UK and 20 Major Developed Countries 1989-91 v 2013-15 - Identifying Progress. Archives of Internal Medicine Research 4 (2021): 019-030.

Abstract

Introduction: Britain’s cancer survival results have been criticised as being significantly higher than twenty Major Developed Countries (MDC). Hence this comparison of current UK Total Age-Standardised-Death-Rates (ASDR), female Breast and Prostate cancer mortality rates with twenty (MDC) between1989 to 2015 to determine any significant change.

Method: WHO data ASDR per million (pm) for Total, Breast and Prostate cancer mortality rates examined for the years 1989-91 to 2013-15. Confidence Intervals (+/-95%) are used to determine any significant differences between the UK and other country’s outcomes over the period. Chi square tests for each nation’s Breast and Prostate mortality.

Results: Every country’s Total ASDR, Breast and Prostate cancer mortality fell except Greece and Japan. Total ASDR Male cancer mortality rates ranged from Portugal 1653pm to Sweden 1232pm. UK at 1475pm were 10th but had been 6th highest. Total ASDR Female
rates went from Denmark’s 1176pm to Japan’s 740pm, the UK 1092pm now 5th but previously had been second highest. No country’s Total rates fell significantly more than Britain’s who had significantly bigger reductions than four other countries for both sexes. Breast mortality ranged from Ireland’s 206pm to Japan’s 99pm, UK rates fell significantly more than five countries. Whilst Breast mortality fell in every country Norway and UK had significantly bigger reductions in Breast than Prostate deaths, conversely France’s Prostate rates fell more than Breast mortality. Prostate mortality went from Norway 213pm Japan’s 60pm, the UK 167pm and five countries had greater reductions than Britain.

Conclusions: Results reflect well on UK services for Total and Breast cancers, showing the NHS achieving more with proportionately less as Britain spends less on health than most MDC. The need how to improve UK prostate results are briefly discussed, such as a public information campaign to match the successful Breast cancer aware programme of the 1990’s.

Keywords: Prostate Cancer; Breast Cancer; International Comparison

1. Introduction
UK cancer survival rates have been found to be poorer than some other developed countries [1-3]. However, survival rates as a measure of improved treatment have been criticised as being less accurate [4, 5] and that measuring mortality rates provides a better indication of relative effectiveness [6]. Moreover, over the past two decades there have been major reductions in cancer mortality in most of twenty-one Major Developed Countries (MDC) [6-8]. These improvements are associated with reduced smoking, a confirmatory indicator that life-style behaviour is linked to the development of cancer [9, 10]. This is exemplified by the association of raised BMI with neoplastic disease [11], and the multiplicity of contributory causes for cancer, the role of both genetic and epigenetic factors being readily acknowledged [12-14]. However, findings both in the USA and the UK point towards the importance of strong socio-economic factors. Thus, variations in cancer mortality between people in higher and lower socio-economic groups and in the richer and poorer regions of Britain, highlight the significance of wider environmental factors in addition to any underlying genetic predisposition [15-18].

One intriguing finding is that Western Europe - which contains 9% of the world population - has 25% of the world incidence of cancer [8]. Is this because of the greater availability of diagnostic services? For example, with prostate cancer rates have never been so high but this is ascribed to the use of PSA testing and improved diagnosis. Moreover, some have stated that the use of screening may have resulted in an over diagnosis of prostate cancer, with the detected cancer often being of low malignant potential and with no need for invasive treatment [19-21]. In a study of the current incidence of cancer in Europe there were 3.91 million new cases in 2018, the most prevalent sites being breast, colorectal, lung and prostate [8]. A recent study on the projections of cancer in Europe from 2015 up to 2035 suggested that there will be a slight decrease in male cancer rates (0.03%) but an increase of 0.11% in female cancer rates [7]. This raises the question of why? Thus, although any long-term study of cancer mortality rates will show that female cancer mortality is generally still lower than males - the gap has narrowed. It also suggests that macro socio-economic changes, perhaps related in-part to the greater integration of women into the work place, has led to a situation where they too are now at a similar risk of exposure to any work related environmental carcinogenic triggers, as their male counterparts [11, 13, 14].
These questions have led to this explorative study that examines changes in Total cancer rates, as reported using WHO Age-Standardised-Death-Rates (ASDR), which control for age, gender and population and of the archetypal gender cancers of female breast and prostate disease in the UK compared with the twenty other MDC [22]. We have placed the analysis within an international comparative perspective because earlier research on post-diagnosis cancer survival was quite critical of the UK survival results [1-3]. However, there are inherent problems in measuring survival rates, which were often based upon different baselines [4, 5], whereas it has been shown that counting actual mortality rates resolves this dilemma and provides a firmer comparative parameter [6]. Consequently, we ask whether over the past twenty-five years, have there been any significant differences in the reductions between total ASDR for ALL cancers by gender with a separate analysis of female breast and prostate mortality rates in the UK compared to the other twenty MDC. The working null hypothesis is that there will be no statistically significant difference in the reductions between male and female total cancer mortality and between female breast and prostate cancer deaths, between the UK and other MDC over the period 1989-91 and 2013-15.

2. Methods

This is a population-based study. All mortality data is drawn from the latest WHO annual statistics, updated May 2018 [22]. The output of national efforts to effectively prevent and treat cancer, can be seen in the current WHO Total cancer mortality statistics based upon Age-Standardised-Death-Rates (ASDR) per million (pm) for ALL Malignant Neoplasm deaths by sex in the International Classification of Diseases (coded C00 – C97) [23]. This is used in WHO data and for ASDR for Prostate cancer deaths (ICD 10 coded C61) and female Breast cancer (ICD 10 coded C50) rates per million (pm) [23]. Age-Standardised-Death-Rates (ASDR) are used to compare between different countries, crucially based upon estimates of the average world population age-structure constructed for the period 2000-2025. The use of an average world population as well as a time series of observations, removes the effects of historical events such as wars and famine on population age composition [22]. It should be noted that the WHO Age-Standardized-Death-Rates based on the new standard are not comparable to previous estimates that are based on some earlier standard [22]. However, WHO acknowledge that to some extent for European countries, there is a slight inherent emphasis on how elderly rates contribute to the final ASDR. The real value of using ASDR is that it creates an equality between rates in different countries highlighting the true variation between countries after controlling for age, sex, population and disease patterns. Thus, the use of ASDR is a more powerful comparative rate enables comparisons to be made between countries of differing size, age structure from which to produce a percentage or ratio of change in mortality rates over the period.

The baseline years are the 3years averages for 1989-91, compared with the index 3year average for 2013-15. Four countries have earlier index years, Canada and New Zealand 2011-13 and France and Ireland for 2012-14. Any significant differences between the UK and the other MDC are tested by calculating Confidence Intervals (+/- 95%) using the SPSS programme. In addition, any variation between a country’s female Breast and Prostate outcomes are compared by using chi square tests, with probability levels of <0.05 (2-tailed) which were considered statistically significant using data from the breast and prostate mortality tables. The study provides a profile of how well each nation has improved it cancer mortality, in particular for Breast and Prostate cancers, which was a major aim of the
Strategy for Cancer’ of the UK government [24] and compares the UK outcomes between 1989-91 v 2013-15 with the twenty other MDC.

3. Results

3.1 Total (ASDR) cancer mortality by sex

3.1.1 Total male neoplasm ASDR: These are shown in Table 1 and demonstrates that every country reduced its Total mortality rates over the period 1989-91 to 2013-15. The highest rates were seen in Portugal at 1653pm, followed by France at 1613pm and Greece at 1607pm down to lows in Sweden at 1232pm, Finland at 1241pm and Switzerland at 1255pm. The UK was 10th highest at 1475pm with the current average of the other MDC (minus the UK) being 1439pm. The UK improved its mortality relative position from previously being sixth highest to falling to tenth, even as all the other countries reduced their mortality rates.

The average MDC reduction in Total male mortality rates was 27% to the UK’s 31%. Confidence Interval results showed that UK males had significantly bigger reductions in mortality than Portugal, Greece, Spain and Sweden, whilst no country had significantly bigger falls in total male cancer mortality rates than the UK over the period.

3.1.2 Female total neoplasm ASDR: The highest female Total ASDR was seen in Denmark at 1176pm followed by Ireland at 1152pm and the Netherlands at 1143pm down to Japan at 740pm, Spain at 775pm and Portugal at 814pm, the other MDC averaged 946pm. The UK is now 5th at 1092pm after been third highest in the 1989-91 period. The other MDC average reduction was 16% to the UK’s 25%. Confidence Intervals showed that the UK had statistically significant larger reductions over the period than Australia, France, Greece, Italy and the Netherlands, whilst again no other country had bigger falls in total female cancer mortality than the UK.

3.1.3 Female breast cancer ASDR: Every country, except Japan had substantial reductions over the period, with falls ranging from -27% to -45%, with the other MDC averaging -35%. The highest current rates are in Ireland at 206pm, the Netherlands at 190pm and Germany and New Zealand at 177pm, down to lows of 99pm in Japan, 118pm in Norway, and 123pm in Spain, the other MDC averaged 156pm. The UK were fifth at 174pm but previously had been second highest. The other MDC average reduction was 34% to the UK’s 47% over the period. Confidence Interval results showed that the UK had significantly bigger reductions over the period than France, Germany, Greece, Japan and Portugal. Furthermore, no other nation had significantly greater falls in breast cancer mortality than the UK.

3.1.4 Prostate cancer ASDR: Every country, except Greece (+6%) and Japan (+20%) had substantial falls in prostate mortality, ranging from -17% to -49%, the other MDC averaging 32% to the UK’s 22% fall over the period. Highest prostate cancer mortality rates were seen in Norway at 213pm, Sweden at 210pm and Denmark at 207pm. The lowest was 60pm in Japan, 93pm in Italy and 108pm in the USA, the other MDC averaged 143pm. The UK’s position relatively worsened as Britain is now fifth highest at 167pm having previously been 15th of the twenty-one countries. Confidence Intervals showed that Austria, Belgium, Canada, France, and the USA had statistically significant bigger reductions in prostate cancer mortality than the UK over the period.

3.1.5 Changes in national breast and prostate mortalities: In comparing each country’s breast and prostate outcomes over the period only France had a greater reduction in prostate deaths compared with falls
in breast cancer mortality (p<0.02). Conversely, there were significantly greater reductions in breast cancer compared to prostate cancer mortality in Norway (<0.04) and the UK (p<0.01). Thus, with these three exceptions the archetypal of male and female cancers had relatively similar improvements over the period in the majority of MDC.

| Country, Year, & Current rank | Males 1989-91 | Males 2013-15 | % of change | CI Lower | CI Upper |
|------------------------------|---------------|---------------|-------------|----------|----------|
| 1. Portugal                  | 1704          | 1653          | -3          | 1.27     | 1.54     |
| 2. France 2012-14            | 2371          | 1613          | -32         | 0.89     | 1.07     |
| 3. Greece                    | 1652          | 1607          | -3          | 1.27     | 1.54     |
| 4. Netherlands               | 2284          | 1577          | -31         | 0.91     | 1.09     |
| 5. Spain                     | 2006          | 1544          | -23         | 1.01     | 1.22     |
| 6. Denmark                   | 2186          | 1541          | -30         | 0.92     | 1.11     |
| 7. Belgium                   | 2339          | 1510          | -35         | 0.85     | 1.02     |
| 8. Ireland 2012-14           | 2052          | 1504          | -27         | 0.96     | 1.16     |
| 9. Italy                     | 2227          | 1490          | -33         | 0.88     | 1.06     |
| 10. UK                       | 2124          | 1475          | -31         | 0.91     | 1.10     |
| 11. Germany 1990             | 2103          | 1475          | -30         | 0.92     | 1.11     |
| 12. New Zealand 2011-13      | 1986          | 1422          | -28         | 0.94     | 1.13     |
| 13. Austria                  | 2093          | 1418          | -32         | 0.89     | 1.07     |
| 14. Japan                    | 1977          | 1375          | -30         | 0.91     | 1.10     |
| 15. Canada 2011-13           | 1986          | 1360          | -32         | 0.90     | 1.09     |
| 16. Australia                | 1883          | 1330          | -29         | 0.92     | 1.12     |
| 17. Norway                   | 1741          | 1318          | -24         | 0.99     | 1.20     |
| 18. USA                      | 1949          | 1310          | -33         | 0.88     | 1.07     |
| 19. Switzerland 1993-95      | 1773          | 1255          | -29         | 0.92     | 1.12     |
| 20. Finland                  | 1837          | 1241          | -32         | 0.88     | 1.07     |
| 21. Sweden                   | 1555          | 1232          | -21         | 1.03     | 1.26     |
| **MDC Average (-UK)**        | **1985**      | **1439**      | **-27**     |          |          |

Correlating ranks of % reduction with %GDPEH Rho= +0.4573 p<0.025.
UK: MDC Significantly different CI in BOLD

**Table 1**: Male Total Neoplasms ASDR per million 1989-2015. Ranked by Highest rates. Confidence Intervals Compares UK Reductions to Other Major Developed Countries.

| Country, Year & Current rank | Female 1989-91 | Female 2013-15 | % of Change | CI Lower | CI Upper |
|------------------------------|---------------|---------------|-------------|----------|----------|
| 1. Denmark                   | 1634          | 1176          | -28         | 0.86     | 1.06     |
| 2. Ireland 2012-14           | 1410          | 1152          | -28         | 0.97     | 1.21     |
| 3. Netherlands               | 1278          | 1143          | -21         | 1.06     | 1.33     |
Correlating ranks of % reduction with %GDPEH Rho= +0.15999 n.sig.

UK: MDC Significantly different CI in BOLD

| Country, Years & Current rank | Breast 1989 v 2015 | % Change | CI UK:MDC |
|------------------------------|--------------------|----------|-----------|
|                              |                    |          | Lower:    |
|                              |                    |          | Upper:    |
| 1. Ireland 2012-14           | 336 – 206          | -39      | 0.89      |
|                              |                    |          | 1.48      |
| 2. Netherlands                | 303 – 190          | -37      | 0.91      |
|                              |                    |          | 1.52      |
| 3. Germany 1990              | 244 – 177          | -27      | 1.04      |
|                              |                    |          | 1.78      |
| 4. New Zealand 2011-13       | 298 – 177          | -40      | 0.86      |
|                              |                    |          | 1.45      |
| 5. UK                        | 326 - 174          | -47      | 0.77      |
|                              |                    |          | 1.30      |
| 6. Denmark                   | 288 – 172          | -40      | 0.86      |
|                              |                    |          | 1.45      |
| 7. France 2012-14            | 219 – 170          | -28      | 1.11      |
|                              |                    |          | 1.91      |
| 8. Italy                     | 233 – 160          | -31      | 0.98      |
|                              |                    |          | 1.69      |
| 9. Austria                   | 247 – 158          | -36      | 0.91      |
|                              |                    |          | 1.57      |
| 10. Greece                   | 171 – 157          | -8       | 1.29      |
|                              |                    |          | 1.72      |
| 11. Canada 2011-13           | 266 – 155          | -42      | 0.83      |
|                              |                    |          | 1.43      |

**Table 2:** Female Total Neoplasms ASDR per million 1989-2015 ranked by highest rates. Confidence Intervals
Compares UK Reductions to Other Major Developed Countries.
| Country, Years & Current rank | Prostate 1989 v 2015 | % Change | CI UK: MDC Lower | CI UK: MDC Upper |
|------------------------------|----------------------|----------|------------------|------------------|
| 1. Norway                    | 280 - 213            | -24      | 0.74             | 1.28             |
| 2. Sweden                    | 267 - 210            | -21      | 0.77             | 1.32             |
| 3. Denmark                   | 249 - 207            | -17      | 0.81             | 1.40             |
| 4. New Zealand 2011-13       | 237 - 168            | -29      | 0.68             | 1.21             |
| 5. UK                        | 214 - 167            | -22      | 0.75             | 1.33             |
| 6. Ireland 2012-14           | 230 - 163            | -29      | 0.68             | 1.21             |
| 7. Netherlands               | 237 - 161            | -32      | 0.65             | 1.16             |
| 8. Switzerland 93            | 248 - 156            | -37      | 0.61             | 1.07             |
| 9. Finland                   | 236 - 155            | -34      | 0.63             | 1.12             |
| 10. Portugal 2012-14         | 185 - 154            | -17      | 0.79             | 1.43             |
| 11. Australia                | 230 - 147            | -36      | 0.61             | 1.09             |
| 12. Germany 1990             | 212 - 145            | -32      | 0.65             | 1.17             |
| 13. Austria                  | 231 - 130            | -44      | 0.54             | 0.97             |
| 14. Belgium                  | 238 - 123            | -49      | 0.49             | 0.89             |
| 15. France 2012-14           | 223 - 122            | -45      | 0.52             | 0.95             |
| 16. Canada 2011-13           | 217 - 120            | -45      | 0.52             | 0.96             |
| 17. Greece                   | 108 - 115            | +6       | 0.98             | 1.90             |
| 18. Spain                    | 170 - 111            | -35      | 0.61             | 1.14             |
| 19. USA                      | 218 - 108            | -50      | 0.47             | 0.86             |

Correlating ranks of % reduction with %GDPEH Rho = -0.0872 n.sig.
UK:MDC Significantly different CI in BOLD

**Table 3:** Female Breast Cancer Deaths ASDR per million 1989-91 v 2013-15 ranked by highest rates. Confidence intervals Compares UK with Other Major Developed Countries.


Table 4: Prostate Cancer Deaths ASDR per million 1989-91 v 2013-15. Ranked by highest rates. Confidence intervals Compares UK with Other Major Developed Countries.

| Country & Years | Breast Ratio of Change | Prostate Ratio of Change | Chi Square P value |
|-----------------|------------------------|--------------------------|--------------------|
| 1. UK           | 0.53                   | 0.78                     | 7.43 - p<0.006     |
| 2. Denmark      | 0.60                   | 0.83                     | 6.05 - p<0.02      |
| 3. Norway       | 0.54                   | 0.76                     | 4.56 - p<0.04      |
| 4. France       | 0.72                   | 0.55                     | 5.30 - p<0.03      |
| 6= Japan        | 1.46                   | 1.20                     | 2.19 - p<0.2       |
| 6=. New Zealand | 0.60                   | 0.71                     | 1.63 - p<0.2       |
| 6= USA          | 0.60                   | 0.50                     | 1.56 - p<0.2       |
| 9= Ireland      | 0.61                   | 0.71                     | 1.15 - p<0.3       |
| 9=. Sweden      | 0.68                   | 0.79                     | 1.07 - p<0.3       |
| 9=. Portugal    | 0.72                   | 0.83                     | 0.93 - p<0.3       |
| 12=. Greece     | 0.92                   | 1.06                     | 0.73 - p<0.4       |
| 12=. Switzerland| 0.55                   | 0.63                     | 0.85 - p<0.4       |
| 12=. Austria    | 0.64                   | 0.54                     | 0.74 - p<0.4       |
| 15=. Netherlands| 0.63                   | 0.68                     | 0.33 - p<0.6       |
| 15=. Italy      | 0.69                   | 0.62                     | 0.33 - p<0.6       |
| 17=. Germany    | 0.73                   | 0.68                     | 0.16 - p<0.7       |
| 17=. Finland    | 0.70                   | 0.66                     | 0.23 - p<0.7       |
| 19. Canada      | 0.58                   | 0.55                     | 0.12 - p<0.8       |
| 20=. Spain      | 0.64                   | 0.65                     | 0.13 - p<0.9       |
| 20=. Belgium    | 0.52                   | 0.51                     | 0.10 - p<0.9       |

Significant in BOLD

Table 5: Chi Square Results Comparing Changes in Breast v Prostate Mortality 1989-2015. Ranked By Widest Breast v Prostate Reduction.

4. Discussion

4.1 Limitations

This study is inevitably a broad-brush analysis. Whilst it demonstrates there have been differences between British female breast and prostate cancer outcomes, we do not know about any changes in cancer deaths in other male sites, which might have accounted for the comparatively good Total cancer outcomes for UK

Archives of Internal Medicine Research
males. Furthermore, this study cannot explain the reasons for the significant differences that have been identified between the UK and other countries which will require country-specific further research. Notwithstanding, the study provides a baseline to measure any future progress. The null hypothesis can be partly rejected as UK male and female Total cancer mortality rates fell proportionally more than four other major developed countries and none had improved more than Britain. However, whilst the UK did significantly better than five other MDC for breast cancer mortality the UK had a substantially worse outcome than five nations for prostate cancer over the period. Thus, relatively and comparatively, British males did less well than UK females. In relation to prostate and breast cancer France and Norway had relatively different outcomes for their exemplar male female cancer rates. We can only speculate as to why this might have happened.

One salient finding is that every country has reduced its Total male and female cancer deaths which reflects well on cancer services in most countries and should be a boost for the morale of patients and front-line staff. It is noteworthy that reductions of UK Total male and female plus female breast cancer rates were better than the average falls of the other countries. This should provide a more positive message than studies of poorer UK survival rates [1-3]. However, despite these undoubted improvements, UK actual mortality rates are still slightly higher than the average of the other MDC total, breast and prostate cancers. Nevertheless, it should be remembered that the UK had the lowest average %GDPEH over the 1980-2016 period which is a nation’s fiscal context in which all services operate. Indeed it has been found that whilst currently the UK is 13th highest of the twenty-one MDC in terms of current percentage of GDP on health, over the period from 1980 to 2016, the UK still has the lowest average of all nations over the period [25, 26]. Whilst this reflects very positively on the total male and female reductions in cancer mortality, it highlights the relatively weaker outcome of the UK’s prostate results, which must be a matter of concern. The importance of an effective early diagnosis for both prostate and breast cancers is recognised and it has been argued that PSA screening is the most effective way forward [19, 20], although some have expressed concern about cost [21]. MRI approaches might be superior in determining the risk related to aggressive prostate cancer but cost and access are potential issues although the role of MRI in prostate cancer screening is to be the study of an upcoming trial (ReIMAGINE) [27]. However, there continues to be a problem of over-diagnosis and some unnecessary invasive treatment [2]. For whilst prostate cancers are a major cause of European mortality, twenty years after testing it was found that around 100 men need to be screened to prevent one prostate cancer death although PSA testing has contributed to reduced prostate cancer mortality [29] as well as a strategy of active surveillance that reduces unnecessary invasive procedures [19, 20]. Against this background of an encouraging reduction in prostate cancer deaths, it is difficult to explain the relative anomaly of the UK results, especially against general improvements in overall UK male cancer outcomes, in comparison with British female breast cancer results over the period. The medical and technological developments related to urology and cancer treatments are recognised across the Western world, so might the UK’s worsened position be due to British urology services being proportionately less well funded than others, though a recent direct comparison on 24 mortality categories, the UK had significantly lower overall rates than the USA [30].

One barrier to early PSA testing and screening is the
concern about possible stress to the patient surrounding such a potential diagnosis. However, a British study found most men were quite resilient, though results were negatively influenced by socio-economic factors [31] but relatively easy access to a GP can help in avoiding these problems [15]. Indeed, apart from disproportionate high anxiety about colorectal cancer, anxieties surrounding screening for cancer are relatively quickly resolved [32]. This brings us to the conclusion that there is need for UK specific research to seek to explain this apparent anomaly so that urology services for prostate cancer, whilst undoubtedly improved, can match the successes seen with UK breast and total cancer services.

One possible reason for the slower improvements in prostate cancer outcomes may be due to a lack of a sustained public campaign, as it does not seem that British men are more anxious about screening for prostate [30]. Such an approach should and could be positive, highlighting that prostate cancer mortality rates have never been lower and treatment more effective and that the PSA test is very simple although PSA screening is not endorsed by the British Association of Urological Surgeons. However, a new initiative by Prostate Cancer UK has called for a March for Men, similar to the Breast Cancer UK awareness project as it recognised the apparent reluctance of men to recognise problems and seek help for them. Crucially anything that would encourage men to come forward earlier to their GP’s ‘well-men’ project, may lead to British prostate mortality rates being even lower. However, overall, these results should be encouraging for patients, their families and front-line staff, especially in the UK, which continues to clinically achieve proportionally more with financially relatively less [30].

Acknowledgements
None of the authors have any vested or conflict of interest in the study. Nor was there any external funding for the project. All the authors were involved in the design, development, analysis and final write-up of the study.

Ethical Statement
This study was an original analysis of secondary data and no people or animals were involved so no ethical approval was required.

References
1. Berrino F, De Angelis S, Sant M, et al. Survival for eight major cancers and all cancers combined for European adults diagnosed in 1995-99: Results of EUROCARE-4 study. Lancet Oncol 8 (2007): 773-783.
2. Coleman MP, Forman D, Bryant J, et al and the ICBP Module 1 Working Group. 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 (2011): 127-138.
3. Arnold M, Rutherford MJ, Bardot A, et al. Progress in cancer survival, mortality, and incidence in seven high-income countries 1995-2014 (ICBP SURVMARK-2): a population-based study. Lancet Oncol (2019).
4. Wegwarth O, Gaissmaier W, Gigerenzer G. Deceiving numbers : Survial rates and their impact upon Doctors communication. Med Decis Making (2010).
5. Autier P, Boniol M. Caution needed for country specific cancers survival. Lancet 377 (2011): 99-101.
6. Pritchard C, Rosenorn-Lanng E, Hickish T, et al. Population Based Study Comparing UK and 20 Western countries efficiency in reducing
adult (55-74) Cancer and Total Mortality rates 1989-2010: cause for cautious celebration? Journal Royal Society Medicine Open 3 (2016): 1-10.

7. Smittenaar CR, Petersen KA, Stewart K, et al. Cancer incidence and mortality projections in the UK until 2035. Br J Cancer 115 (2016): 1147-1155.

8. Ferlay J, Colombet M, Soerjomataram I, et al. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. Int J Cancer 144 (2019): 1941-1953.

9. Bhaskaran K, Douglas I, Forbes H, et al. Body-mass index and risk of 22 specific cancers: a population-based cohort study of 5.24 million UK adults. Lancet 384 (2014): 755-765.

10. Pierce JP, Shi Y, McMenamin SB, et al. Trends in Lung Cancer and Cigarette Smoking: California Compared to the Rest of the United States. Cancer Prev Res (Phila) 12 (2019): 3-12.

11. Lingfors H, Persson LG. All-cause mortality among young men 24-26 years after a lifestyle health dialogue in a Swedish primary care setting: a longitudinal follow-up register study. BMJ Open 9 (2019): e022474.

12. Sampson JN, Wheeler WA, Yeager M, et al. Analysis of Heritability and Shared Heritability Based on Genome-Wide Association Studies for Thirteen Cancer Types. J Natl Cancer Inst 107 (2015): djv279.

13. Haylock RGE, Gillies M, Hunter N, et al. Cancer mortality and incidence following external occupational radiation exposure: an update of the 3rd analysis of the UK national registry for radiation workers. Br J Cancer 119 (2018): 631-637.

14. O'Mara TA, Glubb DM, Kho PF, et al. Genome-wide association studies of endometrial cancer: Latest developments and future directions.

15. Sahar Q Khan, Amy Berrington de Gonzalez, Ana F Best, et al. Infant and Youth Mortality Trends by Race/Ethnicity and Cause of Death in the United States. JAMA Pediatr (2018): e183317.

16. Lyratzopoulus G, Berbiere JM, Rachet B. Changes over time in socio-inequalities in breast and rectal cancer survival in England and Wales during a 32year period (1973-2004): The potential role of health care. Ann Oncol 3 (2011): 35-41.

17. Murage P, Bachmann MO, Crawford SM McPhail S, et al. Geographical access to GPs and modes of cancer diagnosis in England: a cross-sectional study. Fam Pract 36 (2019): 284-290.

18. Tweed EJ, Allardice GM, McLoone P, et al. Socio-economic inequalities in the incidence of four common cancers: a population-based registry study. Public Health 154 (2018): 1-10.

19. Gandaglia G, Albers P, Abrahamsson PA, et al. Structured Population-based Prostate-specific Antigen Screening for Prostate Cancer: The European Association of Urology Position in 2019. Eur Urol (2019).

20. Gnanapragasam VJ, Barrett T, Thankapannair V, et al. Using prognosis to guide inclusion criteria, define standardized end-points and stratify follow up in active surveillance for prostate cancer. BJU Int (2019).

21. Smith-Palmer J, Takizawa C, Valentine W. Literature review of the burden of prostate cancer in Germany, France, the United Kingdom and Canada. BMC Urol 19 (2019): 19.

22. W.H.O. World Statistics Annual (2019).

23. International Statistical Classification of Diseases (2020) 10th Revision. WHO (2020).
24. D.o.H. Improving Outcomes: A strategy for Cancer. Department of Health, London (2011).

25. Harding AJE, Pritchard C. UK and Twenty Comparable Countries GDP Expenditure-on-Health 1980-2013: The Historic and Continued Low Priority of UK Health Related Expenditure. International Journal of Health Policy & Management 5 (2016): 519-523.

26. Pritchard C, Porter S, Williams R, et al. Mortality in the USA, the UK and Other Western Countries, 1989-2015: What is wrong with the US Health?" International Journal of Health Services. In press (2020).

27. Panebianco V, Valerio MC, Giuliani A, et al. Clinical Utility of Multiparametric Magnetic Resonance Imaging as the First-line Tool for Men with High Clinical Suspicion of Prostate Cancer. Eur Urol Oncol 1 (2018): 208-214.

28. Carlsson SV, Månsson M, Moss S, et al. Could Differences in Treatment Between Trial Arms Explain the Reduction in Prostate Cancer Mortality in the European Randomized Study of Screening for Prostate Cancer? Eur Urol 75 (2019): 1015-1022.

29. Hugosson J, Roobol MJ, Månsson M, et al. ERSPC investigators. A 16-yr Follow-up of the European Randomized study of Screening for Prostate Cancer. Eur Urol (2019).

30. Pritchard C, Porter S, Williams R. A Population-Based Study of 33 Causes of Death Amongst America’s Five Ethnic Populations 2015. In Pursuit of Social Justice. Archives of Health Science 4 (2020): 1-9.

31. Wright P, Wilding S, Watson E, et al. Key factors associated with social distress after prostate cancer: Results from the United Kingdom Life after Prostate Cancer diagnosis study. Cancer Epidemiol 60 (2019): 201-207.

32. Cohn E, Lurie I, Yang YX, et al. Posttraumatic Stress Disorder and Cancer Risk: A Nested Case-Control Study. J Trauma Stress 31 (2018): 919-926.