The wealth of distinguished doctors: retrospective survey

I C McManus

Department of Psychology, University College London, London WC1E 6BT
I C McManus
professor of psychology and medical education
i.mcmanus@ucl.ac.uk

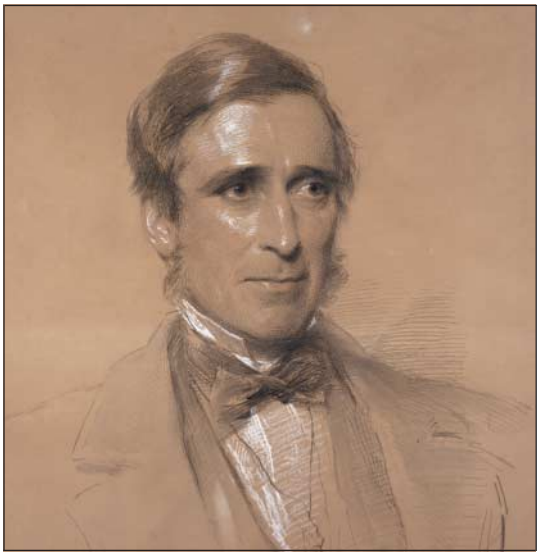
BMJ 2005;331:1520–3

Objective To assess changes in the wealth of distinguished doctors in the United Kingdom between 1860 and 2001.
Design Retrospective survey.
Setting The UK.
Participants 980 doctors of sufficient distinction to be included in the *Oxford Dictionary of National Biography* and who died between 1860 and 2001.
Main outcome measures Wealth at death, based on probate records and adjusted relative to average earnings in 2002.
Results The wealth of distinguished doctors declined substantially between 1860 and 2001, and paralleled a decline in the relative income of doctors in general. The wealth of distinguished doctors also declined relative to other groups of distinguished individuals.
Conclusions In the 19th century, distinction in doctors was accompanied by substantial wealth, whereas by the end of the 20th century, the most distinguished doctors were less wealthy than their contemporaries who had achieved national distinction in other areas.

> "Education in . . . the liberal professions is . . . tedious and expensive. The pecuniary recompense, therefore . . . of . . . physicians ought to be musch more liberal; and it is so accordingly."
>
> Adam Smith, *The Wealth of Nations*, Bk I:X (1776)[1]

Sir James Paget, one of the great 19th century surgeons, died on 30 December 1899, leaving an estate valued for probate at £74 861, or about £26m at 2002 prices. A profession in Victorian Britain, as the novelist Anthony Trollope wrote, was "a calling by which a gentleman, not born to the inheritance of a gentleman's allowance of good things, might ingeniously obtain the same by some exercise of his own abilities"[2] (and as Alan Hollinghurst reminds us in *The Line of Beauty* "Trollope's ... very good on money"[3]).

Paget's wealth prompts a series of questions about the wealth of doctors. I had become interested in him while studying his work on medical education,[4] carried out in collaboration with Sir Thomas Smith and Mr George William Callender, fellow surgeons at Bart's. Smith died in 1909, at the age of 76, and was richer still than Paget, with wealth valued at £101 245 1s 9d (£33m at 2002 prices). Callender, who died in 1878 at the earlier age of 48, was less wealthy, with probate stated as "under £3000" (£1.2m at 2002 prices). Were Paget, Smith, and Callender special because they were surgeons? A previous interest of mine was Sir Thomas Watson,[5] writer of one of the most successful Victorian textbooks of medicine,[6 7] president of the Royal College of Physicians, and the author of an important early study of situs inversus.[8] At his death in 1882, his wealth was £164 407, equivalent to £68m in modern terms. All these doctors were rich men.



NATIONAL PORTRAIT GALLERY

Sir James Paget—enriched by surgery

Several questions arise. How typical was Paget? How did his wealth compare with other distinguished men of the Victorian era (and almost all were men)? And how did the wealth of distinguished doctors fare into the 20th century? As will be seen below, Paget was not unique among Victorian doctors: he was not rich because he was a surgeon but because he was a hospital doctor, and distinguished doctors in the 20th century fared progressively less well financially.

The recent publication of the *Oxford Dictionary of National Biography* allows an answer to such questions, not only by identifying major contributors to national life but by its systematic inclusion of probate records.[9]

Method

All monetary values are quoted both in actual value as of the year to which they apply, and relative to modern prices calculated against average earnings, using the

Further information, figures A-C, and references 1-25 are on bmj.com

calculator at http://eh.net/hmit/ukcompare, where the most recent values are for 2002. The calculation of relative worth is complex (see supplementary information on bmj.com), and the calculator provides five different estimates. Paget's probate of £74 861 in 1900 can be calculated relative to a retail (consumer) price index (RPI), giving a 2002 value of £4.9m; a gross domestic product (GDP) deflator, an index of all prices in the economy, giving a 2002 value of £6.1m; average earnings, giving a 2002 value of £25.9m; GDP per head, giving a 2002 value of £28.9m; and GDP overall, giving a 2002 value of £41.6m. Each adjustment method has its advantages, but an index relative to average earnings is recommended for comparisons involving relative purchasing power in relation to differences in earnings and wealth,[10] and I use this for the rest of this paper, referring to it as Wealth_{2002} or $£_{2002}$.

Statistical analysis

Analyses of wealth typically find a distribution with a long tail of extremely high values, and it is therefore convenient to plot these as logarithmically transformed data.[11] I used the calculator available at www.wessa.net/co.wasp to calculate the Gini coefficient, a measure of inequality. A value of 1 indicates maximum inequality, with all wealth in the hands of a single individual, and an index of 0 indicates complete equality of resources.[12] Interpreting the Gini coefficient is acknowledged to be problematic,[13 14] but its overwhelming popularity[13] makes it the obvious descriptive statistic. To show the extent of inequality I have used Lorenz curves, which are easily interpreted (see fig B bmj.com).[14]

Results

The *Oxford Dictionary of National Biography* in its update of 4 January 2005 contains biographies of 55 525 individuals, 5671 of whom are female. Official records of wealth at death, typically probate, are available for 17 081 individuals, 2166 of whom are female. Of these, 1205 are for those under the dictionary's subheading of medicine, and 1190 were individuals dying after 1830, the earliest date for which eh.net/hmit/ukcompare provided comparisons of monetary values. These 1190 individuals formed the basis of the present study.

Of the 1190 individuals in the medicine category, 210 did not have medical qualifications, and, of these, 87 (41.4%) were women. The group consisted primarily of nurses, midwives, speech therapists, almoners, and social workers (57); scientists (48); psychologists and educationalists (29); veterinary practitioners (19); pharmacists (12); dentists (11); and a miscellaneous group of others, including Dr Stephen Ward (1912-63), "osteopath and scapegoat." The non-medical category also contained the five wealthiest people in the entire medicine category, James Eno (who produced "Eno's Salts"), William Smith (the hospital reformer and son of W H Smith, the newsagent), Sir Henry Wellcome (the pharmacist and benefactor), John Johnston (the manufacturer of Bovril), and Thomas Holloway (whose pills and ointments eventually funded the college of Royal Holloway, in the University of London), who were worth $£_{2002}$412m, $£_{2002}$379m, $£_{2002}$314m, $£_{2002}$295m, and $£_{2002}$251m.

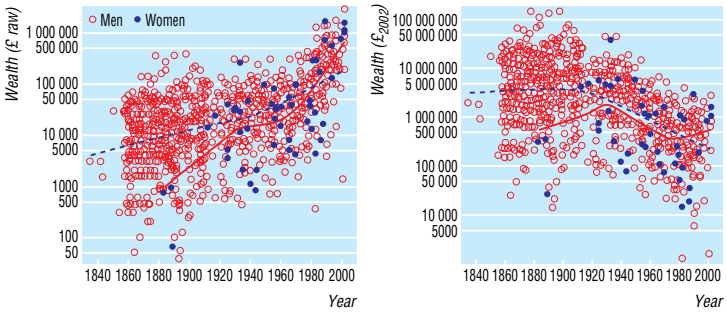


Fig 1 Wealth at death of distinguished doctors in absolute terms (left) and relative to average earnings (right)

Secular trends

The medicine section contained 980 medically qualified people, of whom 63 (6.4%) were women, and these form the basis for the rest of this paper. Absolute measures of wealth at death (fig 1, left), show a clear increase across years. However, the average earnings adjusted values in figure 1 (right) show a very different picture, with the relative wealth of distinguished doctors declining over the period, particularly from about 1900 onwards. Male and female distinguished doctors show no statistical differences in wealth, and sex differences will not be considered further here.

Inequality

The table Wealth_{2002} gives mean and Gini coefficient in relation to year of death. Average wealth drops dramatically in the 20th century, as does the wealth of the richest groups. The Gini coefficient shows a systematic decline between 1880 and 1980, indicating a reduction in the extent of inequality, which parallels general changes in income distribution over the same time period.[15]

Specialty differences

Figure 2 shows the relative earnings of different medical specialties, expressed as a standardised residual of $\log_{10}(\text{Wealth}_{2002})$, taking year of death and age at death into account. The differences between specialties are highly significant (analysis of variance; $F(6,978) = 7.36$, $P < 0.001$). Post hoc tests for differences between the specialties showed that physicians, surgeons, and obstetricians were significantly wealthier than other groups, and the group containing general practitioners and others had lower wealth than the others.

Comparison with other occupational groups

The *Oxford Dictionary of National Biography* classifies its entries into 25 non-mutually exclusive fields of interest, some of which can be broadly regarded as occupational categories (but not others, such as "law and

Mean wealth at death of distinguished doctors, relative to average earnings in 2002, and Gini coefficients by date of death

Date of death	No of doctors	Mean Wealth_{2002} (SD)	Gini coefficient (SE)
1830-79	225	8.05m (£13.7m)	0.633 (0.038)
1880-99	168	10.1m (£19.6m)	0.683 (0.047)
1900-19	112	10.0m (£13.7m)	0.600 (0.051)
1920-39	104	4.97m (£7.63m)	0.607 (0.054)
1940-59	110	2.75m (£3.44m)	0.570 (0.049)
1960-79	129	871k (£1.10m)	0.561 (0.044)
1980-2001	132	597k (£658k)	0.521 (0.041)

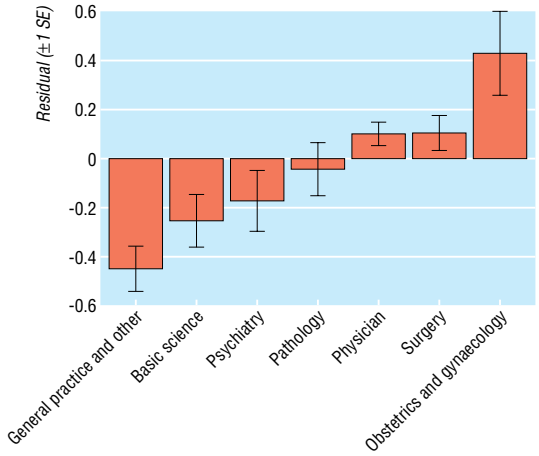


Fig 2 Wealth at death (standardised residual on a log scale after regressing on linear and quadratic effects of year of death, and age at death) of different specialty groups in the distinguished doctors

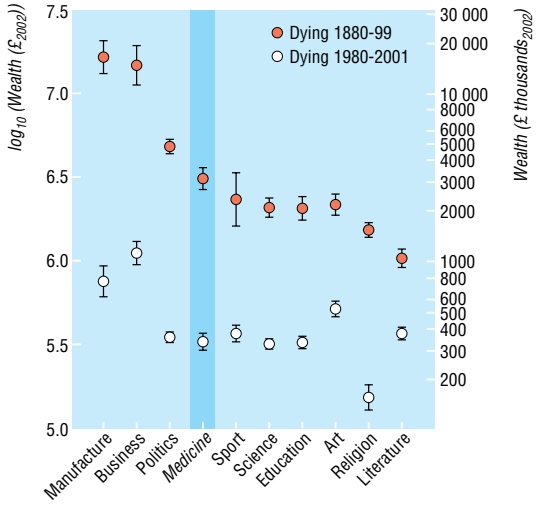


Fig 3 Wealth at death of distinguished individuals in 10 different occupational groups, as categorised by the *Oxford Dictionary of National Biography*. Error bars indicate one standard error

crime" or "individuals"). To compare medicine with other professions, I looked at nine other groups (fig 3). Notably, the wealth of individuals in some categories, particularly politics and business, may reflect inherited wealth. Figure 3 shows the geometric mean $Wealth_{2002}$ for individuals dying at the end of the 19th century (1880-99) and at the end of the 20th century (1980-2001). As well as highly significant effects of group and time period (both $P<0.001$), analysis of variance also showed a significant interaction between group and time period ($F(9,4115)=10.788$, $P<0.001$), showing that the relative ordering of groups had changed. The interaction remained significant when the three highest and the two lowest earning groups in 1880 had been removed from the analysis ($F(4,1742)=3.304$, $P=0.010$). Distinguished doctors showed the largest relative decline: their wealth in absolute terms at the end of the 20th century was 10.5% of that at the end of the 19th century, compared with 13.44%, 12.38%, 13.04%, and 21.78% in the other four middle groups of distinguished individuals.

Distinguished doctors versus doctors in general

The wealth of distinguished doctors declined during the 20th century. An important question concerns the relative decline in the wealth of all doctors over that same period, and the extent to which distinguished doctors' wealth declined disproportionately. Figure 4 summarises data from several sources. The open points show the earnings of medical practitioners for the period 1913 to 1959 (based on Routh[16]), at the 25th, 50th, 75th and 90th centiles. I added an estimate of a typical, presumably median, estimate of general practitioner salary for 2002 (www.pssru.ac.uk/pdf/uc2004/uc2004_s09.pdf). The solid points show the wealth of distinguished doctors from the *Oxford Dictionary of National Biography*, divided into hospital doctors (physicians, surgeons, obstetricians, and psychiatrists) and others (all other categories, including general practitioners, pathologists, and basic scientists). The median age at death of the distinguished doctors was 75, and to make comparison easier with the (living) doctors from the other surveys, they are plotted at the age of 45, midway through their working life (so that those dying between 1960 and 1979 are plotted at 1925, etc). Importantly, I plotted total wealth for doctors from the *Oxford Dictionary of National Biography* and annual income for other doctors. The wealth of doctors from the dictionary is seen to decline in parallel with the income of all doctors.

Selection bias

Selection bias is a risk in this study because the criteria for inclusion in the *Oxford Dictionary of National Biography* have changed over the years, and because doctors included as distinguished in the 19th century are different from those included in the 20th century, with doctors perhaps being chosen as distinguished in the earlier period precisely because of their wealth or their social distinction, rather than because of their professional or scholarly achievement. I have dealt with this in two ways. Firstly, in the supplementary information on bmj.com, I analysed the wealthiest of the cohort of distinguished doctors dying between 1890

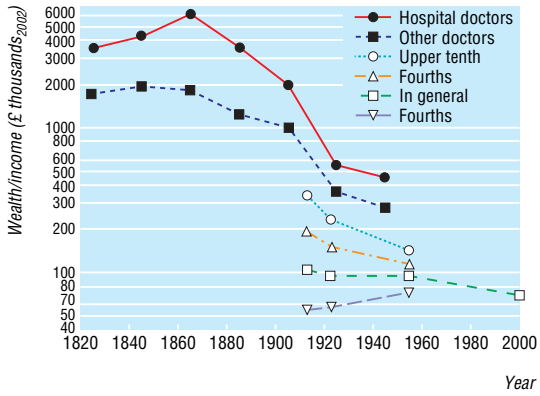


Fig 4 Wealth of medical practitioners in general (median (open squares), fourths (open triangles), and upper tenth (open circles)) for 1913-4, 1922-3, and 1955-6, and median wealth of distinguished doctors in the *Oxford Dictionary of National Biography* (hospital doctors (solid circles); other doctors (solid squares)). Distinguished doctors are plotted at approximate mid-point of working life

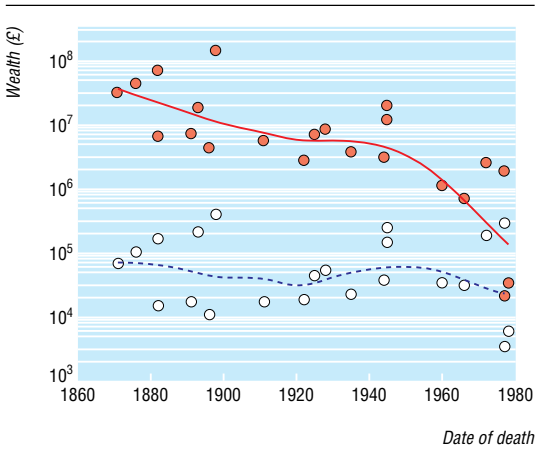


Fig 5 Wealth of the presidents of the Royal College of Physicians of London plotted against date of death. Red circles and red line indicate wealth relative to average earnings in 2002 ($Wealth_{2002}$), and white circles and blue line indicate absolute wealth at time of death. Fitted lines are lowess curves

and 1899 (the decade of Paget's death). In almost all cases, the doctors included as distinguished had made clear professional or intellectual contributions to medicine, which would have been recognised as distinction nowadays. A second way of dealing with the issue is by looking at a single group of doctors who are included in the dictionary and also meet an identical criterion of professional distinction—that of being president of the Royal College of Physicians of London. The dictionary contains biographies of all but one of the 23 doctors who were elected to this post between 1857 and 1966 (the exception is Sir Frederick Taylor (1847-1920), the author of a bestselling textbook of medicine[17]). Figure 5 shows that not only does $Wealth_{2002}$ of presidents of the Royal College of Physicians of London decline significantly (Spearman's correlation coefficient for $Wealth_{2002}$ and date of death $\rho = -0.753$, $P < 0.001$), but even in absolute terms there is no evidence that wealth has risen (Spearman's $\rho = -0.067$, $P = 0.768$). The pattern in presidents of the Royal College of Physicians of London is therefore the same as in distinguished doctors in general.

Discussion

The apparent wealth of distinguished doctors has undoubtedly declined continuously since the 19th century (although the study data cannot entirely dismiss the possibility that criteria for distinction have changed). It is also possible that very wealthy people have found increasingly "tax efficient" ways of disposing of their wealth as estate duties have increased (although if so, then tycoons such as Paul Hamlyn, worth £366 402 436 at his death in 2001, were less than efficient).

Limitations of the study

Representativeness

The distinguished doctors analysed in this study are, of necessity, not generally representative of doctors in the UK. They are, however, a sample of much interest in that they include many of the leaders of the profession who achieved major distinction (or, in a few cases, notoriety), which means they have been included in the *Oxford Dictionary of National Biography*.

Differences between doctors and distinguished doctors

Whether the wealth of doctors in general has declined in parallel to the wealth of these distinguished doctors is difficult to ascertain, but the data of figure 4 show that the wealth of distinguished doctors has declined broadly in parallel with that of doctors in general, although perhaps slightly more quickly. In the 19th century, professional distinction and wealth were closely correlated, whereas in the 20th century those components have to some extent become separated, not least with the advent of academic medicine, making it possible that the richest of contemporary doctors now confine themselves to private practise, and hence do not meet the Oxford biographical dictionary's criteria for distinction. If so, other methods of data collection would be necessary to assess that wealth. Nevertheless, it remains true that the acquisition of a large personal fortune was not the major reward of distinguished doctors at the end of the 20th century, unlike the situation a century earlier.

Changing distribution of wealth in society

It is not only distinguished doctors who have become less wealthy. In all of the 10 groups of distinguished individuals who were looked at specifically, the mean wealth declined substantially over the past century, and that is to a large extent a reflection of a growing equalisation of incomes and hence wealth in society. For individuals who died between 1880 and 1899, the 90th centile was 182 times wealthier than the 10th centile, compared with only 29.7 times wealthier for those dying between 1980 and 2001. By the end of the 20th century, relatively fewer distinguished individuals showed vast wealth or abject poverty. By the end of the 20th century, the wealth of distinguished doctors had slipped relative to other groups, and particularly in relation to those in sport, the arts, and literature, and instead of their mean wealth being 4th out of 10 as they were a century earlier, they had become 9th out of 10, with the only group below them being those in religion, a group for whom Adam Smith hoped that, "The respect paid to the profession . . . makes some compensation . . . for the meanness of their pecuniary recompense."[1]

Conclusions

Distinguished doctors in the 19th century were very wealthy, whereas by the end of the 20th century they were proportionately less wealthy. Assessing the correct level of remuneration for doctors is a difficult task, not least because as well as financial reward, doctors are also compensated in part by high levels of status and trust (although both may currently be in decline[18]). Adam Smith was clear that the reward of doctors must be at an adequately high level, for: "We trust our health to the physician … Such confidence could not safely be reposed in people of a very mean or low condition. Their reward must be such, therefore, as may give them that rank in the society which so important a trust requires."[1]

I thank Wiji Arulampalam for her comments.
Contributors: ICMcM is the sole contributor.
Competing interests: None declared.

Supplementary information (pdf)

Method

The top part of figure A shows the value of £1 in 2002 prices for a range of years from 1830 to 2000, on each of the five scales. The differences between the scales are very apparent, with the RPI and GDP deflators showing the remarkable stability of prices during the Victorian period, compared with the growing earnings of the same period. The bottom part of figure A replots the data relative to average earnings, and shows how the purchasing power of the average earner rose consistently from 1830 onwards, reflecting the large rise in standard of living.

Results

Inequality

Figure B shows Lorenz curves for the cohorts dying in 1880-99, 1900-19, 1960-79, and 1980-2001. Other lines are omitted to avoid confusion, but they lie where they would be expected given their Gini coeffficients, with the 1830-79 line in particular lying entirely between the 1880 and 1900 lines. The interpretation of Lorenz curves can be straightforward, for, as Cowell[14] emphasises (on page 30), when the Lorenz curve of one set of data lies wholly inside that of the other, then we would probably find substantial support for the view that the "inside" curve represents a more evenly spread distribution. When interpreted along with the standard errors of the Gini coefficients in table 1 , little doubt remains that the wealth of distinguished doctors became more equal between the end of the 19th century and the end of the 20th century.

Age at death

Age at death

Distinguished doctors who died young have had less time to accumulate wealth, whereas those who die in extreme old age may have had longer to dissipate their earnings,[12] although investment and reduced needs may mitigate that effect. Figure C shows the effect of age at death on log10(wealth), expressed as a standardised residual, taking year of death into account. Taken overall, regression analysis shows significant linear and quadratic effects of age ($P<0.001$ and $P<0.001$, respectively). However, the lowess curve implies a "dogleg" function, with increasing wealth up to about the age of 65, and no trend after that. Regression for doctors younger than 65 at death shows a significant linear trend ($P<0.001$) on age, whereas doctors older than 65 at death show no significant linear trend ($P=0.605$) on age.

Discussion

Limitations of the study

Neither have all of the distinguished doctors become rich through their medical practice (for example, the richest woman doctor, Elizabeth Knight (1869-1933), was the daughter of a wealthy cement manufacturer), and neither are all of the doctors distinguished because of their specifically medical practice or knowledge (for example, the cricketer, Dr W G Grace, or the psychologists W H R Rivers and C S Myers). Official statistics on wealth are also not straightforward and should be interpreted with care.[12]

Changes in the profession over time

The nature of professions also changed in the 20th century. In 1776 Adam Smith commented that "People of the same trade seldom meet together … but that the conversation ends in a conspiracy against the public, or in some contrivance to raise prices."[1] In contrast, the sociologist Eliot Freidson commented in 2001 that modern professions are instead in conflict with the logic of markets, and that, when people of any trade gather together they are far more

likely to talk shop and trade new information, theories, and tricks of the trade.[19] In the second half of the 19th century, James Paget did not cease to talk shop, even in old age, but he accompanied it with an extensive and lucrative private practice (see box).

The finances of Sir James Paget

Born in 1814, Paget qualified as a doctor in 1836, aged 22. His early earnings were unimpressive, about £8/year to start with, and his largest income between 1836 and 1843 was £23 13s[20] (p 188). By 1846 he was earning about £50/year,[21] but until 1850 his income never exceeded £100 (p 188).[21] In his memoirs, he commented (on p 193) that, "If I had died before I was 47 [in 1861], I should have left my wife and children in extreme poverty. Before this time I had not been able to save a shilling … ."[20]Paget's private practice started in 1851, and initially his income was £400/year,[20] after which it "gradually and, with one trivial exception, every year increased till it exceeded £10 000 [/year]," resulting in what he himself described as "the most lucrative surgical practice in London" (all on p 189). After a life threatening episode of septicaemia in 1871,[22] Paget stopped operating, after which his income "fell at once to about £7000, and then slowly decreased" (p 189). Paget had an extremely fashionable practice, not only being surgeon to the royal family, but also treating intellectuals such as George Eliot and G H Lewes. Paget's income was not acquired lightly, but was accompanied by a heavy workload. He visited patients between 8 00 am and 10 00 am, carried out 15-20 consultations at home between 10 00 am and 1 00 pm, then visited the hospital for one and a half to two hours, after which he visited more distant patients. A typical working day in his practice was 11-13 hours, with letter writing and other administration after dinner. He estimated that he travelled 5000-8000 miles (7500-12 000 km) a year visiting patients, often by train.

Although high, Paget's income was not unusual. A doctor in 1850 with a fairly fashionable practice might earn £1000-2000.[23] A physician, Sir William Henry Broadbent (1835-1907), earned £3400 in 1880, and in 1891 he earned more than £13 000 and had to turn away patients. His wealth was £88 139 when he died in 1907.[24] Trollope, in Doctor Thorne (1858), described how Dr Fillgrave, a physician, "who was accustomed to meet, on almost equal terms, the great medical baronets from the metropolis . . . dearly loved a five-pound fee. What physician is so unnatural as not to love it?"[25] Although Fillgrave's normal fee was one guinea (£1/1/0), he was "worth £6000." The fee for Dr Thorne himself, a country general practitioner, was 7/6d. Eight or nine five pound consultations a day, for 300 days a year, could readily have produced Broadbent's highest income.

What is already known on this topic

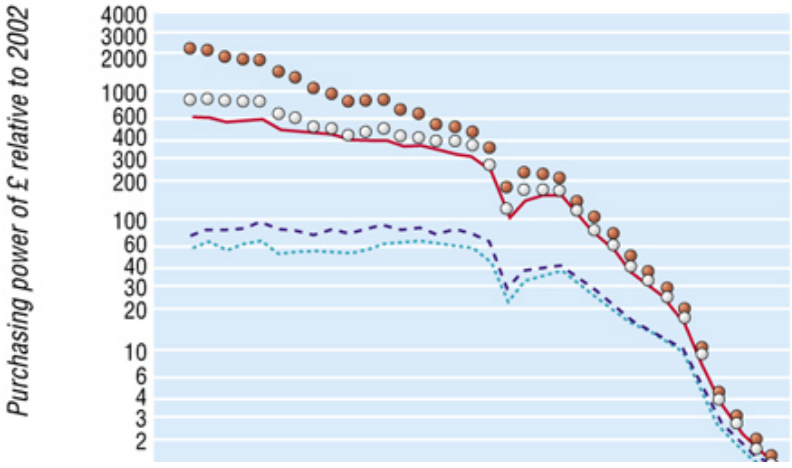
Doctors in Victorian Britain, such as Sir James Paget and Sir Thomas Watson, seem to have been extremely wealthy by modern standards

What this study adds

A systematic survey of distinguished doctors, based on the probate records of the newly revised Oxford Dictionary of National Biography, shows that their wealth was less at the end of the 20th century than during the 19th century

Overall the incomes of doctors seem to have become more equal in the past century and a half

Figure captions



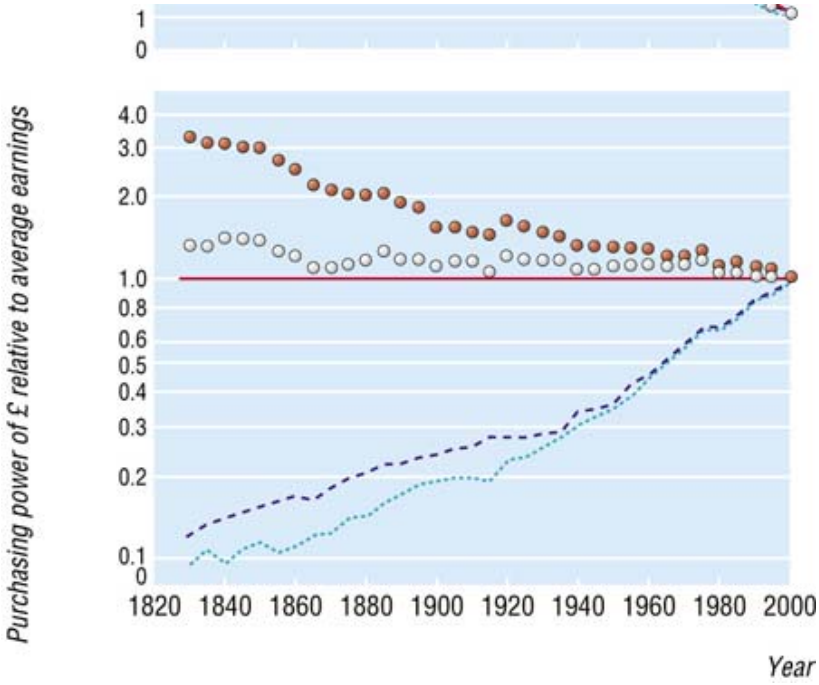


Fig A The relative worth of the pound sterling from 1830 to 2002. Top: Relative purchasing power of the pound (2002=100). Bottom: Purchasing power of the pound in each year, relative to average earnings (=1)

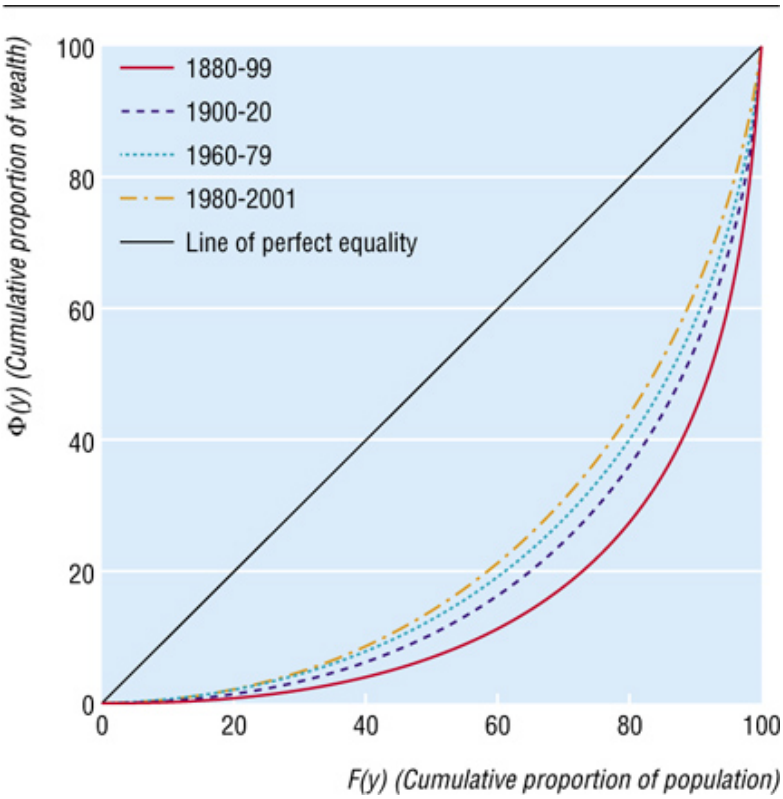


Fig B Lorenz curves for describing inequality.[14] The lines show the proportion of the total wealth (Φ(y); cumulative proportion of wealth; vertical axis) owned by the poorest percentage of the total population (F(y); cumulative proportion of population; horizontal axis). For distinguished doctors dying in 1880-99, the poorest 50% of the population therefore owned only 7.4% of the wealth, and the poorest 90% owned only 46.3% of the wealth. The diagonal shows the expected line when there is no inequality (and the Gini coefficient is zero). As lines move progressively towards the bottom right hand corner so inequality becomes greater (and the Gini coefficients increase)

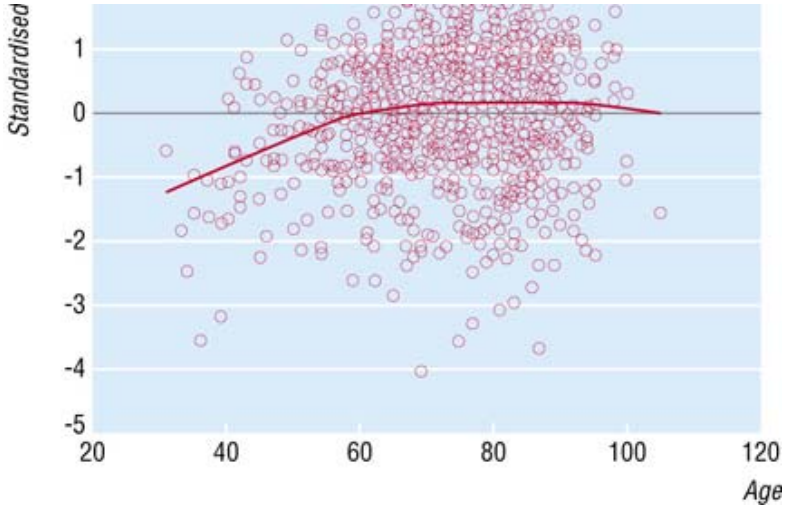


Fig C Wealth at death (standardised residual on a log scale after regressing on linear and quadratic effects of year of death) in relation to age at death. The fitted line is a lowess curve

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The wealth of distinguished doctors:

Supplementary information

i) *Adjusting monetary values for changes across time*.

ii) The criteria for distinction in nineteenth century doctors.

i) *Adjusting monetary values for changes across time.*

Although it seems relatively simple to adjust monetary values across time, that is far from the case in practice. The commonest method, of adjusting against a Retail Price Index, is problematic in a host of ways, not least that products are not the same across time (a car bought now has many technical features which would not have been present in a car bought 50 years ago), and neither are needs the same (candles represented a large and essential proportion of household expenditure in the 19th century, but are now bought mostly for decoration), nor opportunities the same (to discuss the relative cost of air-travel makes no sense in a 19th century context) [1].

The differences between methods of adjustment can be seen by comparing two of them, adjustment against Retail Price Index (RPI), and adjustment against average earnings. Figure S1 shows the summary data of Routh [2] for four different occupational classes from 1913 to 1978, expressed in three different ways. Figure S1a shows the unadjusted (raw) average annual earnings of the groups, and it is clear that salaries in all groups have risen substantially and continually, with the differential between the highest and lowest becoming smaller over time. When adjusted for purchasing power on the basis of the RPI (figure S1b), the same groups also show a rise across time, although proportionately it is far smaller than for the actual monetary values in figure S1a; nevertheless it is clear that the purchasing power of all occupational groups rose from 1911 to 1978, with differentials once more becoming smaller. Finally, the values in adjusted against average earnings in figure S1c show a very different picture. The average earnings of skilled and unskilled manual workers, who form a large proportion of the workforce and hence dominate the calculation of the average wage, remain relatively constant with adjustment for average earnings. However the earnings of professionals on such a basis fell between 1911 and 1978, reflecting reduced wage differentials.

The effect of the different methods of adjustment on salaries of medical practitioners can be seen in figure S2, which is necessarily on a somewhat smaller set of data points, but for the period 1911 to 1955 has the unusual advantage of including quartiles and the upper decile, giving a sense of the dispersion of incomes. Such data are not available after 1955, but for comparison purposes, a 'typical' GP salary for 2002 (see www.pssru.ac.uk/pdf/uc2004/uc2004_s09.pdf) has been included and plotted at the median. Figure S2a (which is the same as figure 7 in the main paper) shows that salaries adjusted for RPI also rose over the same time period. Adjusting salaries for average earnings (figure S2b) shows a rather different picture, with the median salary remaining relatively constant, but the lower quartile rising, and the upper quartile and particularly the upper decile falling over the period 1911 to 1955. The salaries of doctors became more homogenous (less dispersed) during the early twentieth century, and it is unlikely that that effect was reversed in the later twentieth century. The wealth of non-hospital doctors has also been included in figures S2a and S2b for comparative purposes.

Choosing an appropriate method of adjustment for comparing the wealth of doctors is not straightforward. The entire population has become better off relative to the RPI, with most people having substantially greater purchasing power than in the 19th century. Of necessity, most people cannot have become relatively richer over the same time period, because incomes on such a basis are adjusted for the average. For assessing differential wealth and differential incomes, adjustment probably makes most sense in terms of average

earnings, both because, as Officer puts it, "Average earnings are a logical measure for computing relative value of wages, salaries, or other income or wealth." [3], and because, as Sir William Petty, the 17th century philosopher, said, "people [are] not so much interested in their absolute incomes as in their income relative to other people, for [it is] on this that their station in society depend[s]" [2]. The main paper therefore compares the wealth of doctors on the basis of adjustment for average earnings. The key analyses and figures will, however, also be reported here on the basis of RPI adjustment, for the purposes of comparison.

b) Comparison between different professions using average earnings.

Figure S3 shows the equivalent figure to that of figure 6 in the main paper, but adjusted on the basis of average earnings, rather than RPI.

ii) The criteria for distinction in nineteenth century doctors.

An important question concerns whether the doctors included in the ODNB differ in their criteria for distinction from those included at the end of the 20th century. In particular, as it has been put in an editorial comment, "Our hunch would be that in the mid-nineteenth century it was mainly 'society' doctors and surgeons who got in; now it would be worthy medical academics pioneering new treatments or concepts, who traditionally haven't cared much for financial reward". The question therefore is whether the richest doctors in the 19th century are marked by the absence of contributions to the academic, professional and intellectual practice of medicine.

This question has been assessed by considering the sample of all medically qualified individuals in the ODNB who died in the same decade as Sir James Paget (i.e. 1890 to 1899). They are shown in table S1, ranked from the least wealthy to the most wealthy.

At the top of the list is Sir William Jenner, Professor of Medicine at UCL, President of the Royal College of Physicians of London, and Physician to the Queen. However his medical achievements were substantial, and undoubtedly justify his inclusion in the ODNB, and also meant that he was much in demand as a physician in private practice. He wrote classical accounts of the treatment of rickets and of diphtheria, and differentiated typhus from typhoid.

Next in terms of wealth is Sir William Gull, whose medical achievements, amongst others, included the first descriptions of myxoedema and anorexia nervosa. Once again, diagnostic ability, coupled with the respect of peers, meant that he was far from being merely a society doctor. Gull and Jenner were in a class of their own in terms of their wealth, each leaving over £300,000.

At the top of the next group comes Sir Richard Quain, elected FRS for his work on fatty degeneration of the heart. Next in line is Sir William Bowman the ophthalmic surgeon and anatomist, whose name is attached to at least six anatomical structures, including Bowman's capsule in the kidney. Quain and Bowman each left over £100,000.

Of the nine doctors leaving between £50,000 and £100,000, five were surgeons. Sir William Savory, who succeeded Paget at Bart's, was President of the Royal College of Surgeons and published many research papers, Sir John Erichsen was also President of the Royal College

of Surgeons, and was particularly well known for his textbook of surgery. Sir George Murray was, according to the ODNB, "primarily, a scientist and a collector, particularly of items for the museum of anatomy and surgical pathology". Sir Thomas Spencer Wells, the gynaecological surgeon, also President of the Royal College of Surgeons is, of course, still remembered for his eponymous forceps which were a part of his many pioneering contributions to the newly emerging techniques needed in surgery of the abdomen. Finally, the fifth surgeon was Sir James Paget, whose contributions to medicine were manifold and began the present account. Of the non-surgeons, Sir William Roberts, was elected FRS for his multifold contributions to physiology. John Sutherland was an expert on sanitary science and public health. Perhaps the only two member of this group who could possibly be considered as 'society doctors' are Walter Hayle Walshe (although his students may well have disagreed, and he undoubtedly had a wide and well-respected knowledge of medicine and pathology), and William Sharp, whom although medically qualified, practised mainly as a homoepathist, and for whom the ODNB is relatively scathing about his achievements, and says that his, "...claim to recognition rests on his encouragement of the teaching of science in schools and for the establishment of local museums".

Of the 13 doctors leaving between £20,000 and £50,000, most had substantial achievements. Sir John Bucknill was an influential and liberalising psychiatrist who was elected FRS; the surgeon Sir Prescott Gardner Hewett published many research papers and was also elected FRS; Charles Tidy was an influential toxicologist; Sir Richard Owen, the anatomist and palaeontologist was the first to describe the dinosaurs systematically; the surgeon John Wood was an "acknowledged master" in plastic surgery; Arthur Myers was the acknowledged British expert on hypnotism; Sir Morell Mackenzie was "the father of British laryngology"; Alfred Carpenter founded one of the first sewage farms; Michael Waistell Taylor was known as much as an antiquary as a physician; Henry Vandyke Carter was an influential epidemiologist of leprosy; John Marshall was an anatomist, elected FRS, and President of the General Medical Council; Henry Bellew was an army medical officer in India, a sanitary officer, a linguist and an explorer; and the psychiatrist Henry Monro was an ardent reformer of the asylums.

One could continue down the list, with John Langdon Down, the describer of Down's syndrome the next one to be encountered.

There are few of these doctors who would only fit under the somewhat pejorative heading of 'society doctor'. Many were extremely talented individuals, often with specialist skills, and in an age dominated by private practice it is hardly surprising that members of the public would flock to them for their diagnostic ability, and their therapeutic skills. However society did that because these doctors were successful. None really seems to fit the description of being purely and only a 'society doctor'. It seems a real possibility that such individuals existed, but they are not obvious in this sample from the ODNB.

The case of Trollope. A final specific example will refer back to Anthony Trollope, the novelist, who has been cited elsewhere in the paper. In his last years he suffered increasingly from angina, and from what he called 'asthma' (but was probably pulmonary oedema secondary to heart failure), and in October 1882 he saw three doctors, two of whom were specialists: Sir Richard Quain, mentioned above, who was an undoubted specialist on cardiac pathology, and Sir William Jenner (also mentioned above) [4]. The third doctor, Trollope's own doctor, William Murrell, is not included in the ODNB, and might at first sight therefore seem to be an example of the 'society doctor' who concentrated on tending and pampering the needs of the wealthy, and relying on the diagnostic and therapeutic skills of others.

However Murrell, in 1879, was assistant physician at the Royal Hospital for Diseases of the Chest in the City Road (www.victorianlondon.org/dickens/dickens-d.htm), and is perhaps best known nowadays for being the first to introduce nitroglycerin into clinical practice for treating angina [5]. In this case at least, therefore, it is clear that being a doctor to society was not the same as being a 'society doctor' in the pejorative sense.

Doctors dying between 1990 and 1999. The analysis of the previous section concentrated on the wealthiest of the doctors who died between 1890 and 1899. It would probably be invidious to attempt such an analysis for those doctors who died a century later, between 1990 and 1999, and are included in the ODNB. Nevertheless, table S2 provides a listing of those individuals for the convenience of the interested reader who might wish to work through them, comparing them with those who died a century earlier.

Reference List

1. Burnett J. A history of the cost of living. Harmondsworth: Penguin, 1969.

2. Routh G. Occupation and pay in Great Britain, 1906-1979. London: Macmillan, 1980.

3. Officer LH. What Is Its Relative Value in UK Pounds: Methods, Sources, and Examples. http://eh.net/hmit/ukcompare/ukcompessay.htm: 2005.

4. Glendinning V. Trollope. London: Pimlico, 2002.

5. Smith E,.Hart FD. William Murrell, physician and practical therapist. *Brit.Med.J.* 1971;**3**:632-3.

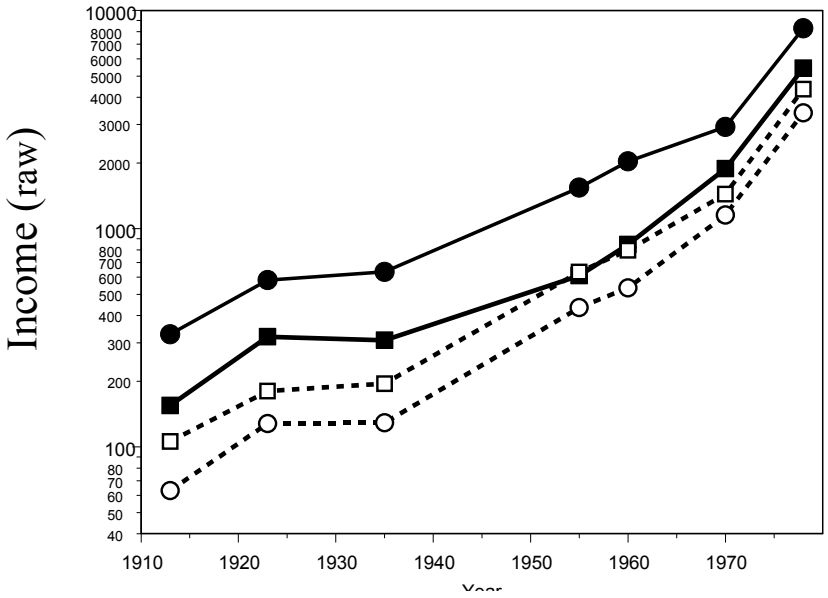
Figure captions.

Figure S1
Income for Higher Professionals (●—●), Lower Professionals (■—■), Skilled workers (□ - - -□) and Unskilled workers (○- - -○) . a)Raw income unadjusted for year; b) Income adjusted for Retail Price Index; c) Income adjusted for Average Earnings.

Figure S2
Wealth of medical practitioners in general (median (open squares), quartiles (open triangles), and upper decile (open circles)) for 1913/4, 1922/3, and 1955/6, and median wealth of distinguished doctors in the ODNB (hospital doctors (solid circles); other doctors (solid squares)). Distinguished doctors are plotted at approximate mid-point of working life. a) Adjusted for RPI, and b) Adjusted for average earnings.

Figure S3
Wealth at death of distinguished individuals in ten different occupational groups, as categorised by the ODNB, for those dying between 1880-99 and 1980-2001. Error bars indicate $\pm$ one standard error. , Adjusted for average earnings.

S1a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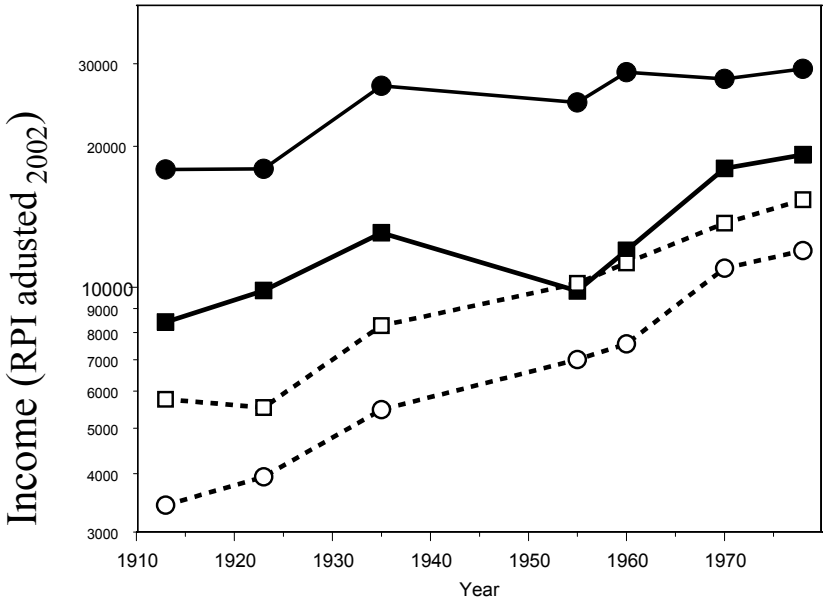
8000
7000
6000
5000
4000
3000
2000
1000
800
700
600
500
400
300
200
100
80
70
60
50
40
1910
1920
1930
1940
1950
1960
1970

S1b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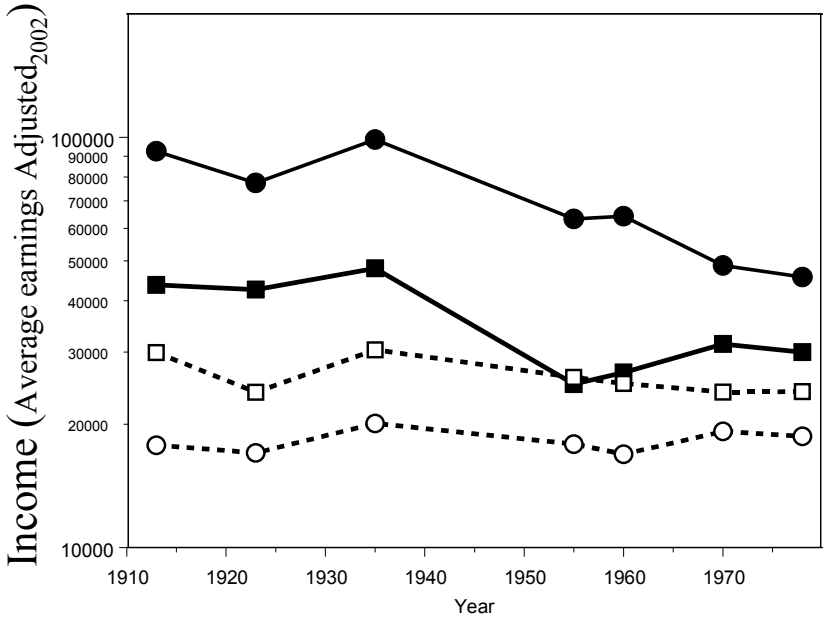
20000
10000
9000
8000
7000
6000
5000
4000
3000
1910
1920
1930
1940
1950
1960
1970
Year

S1c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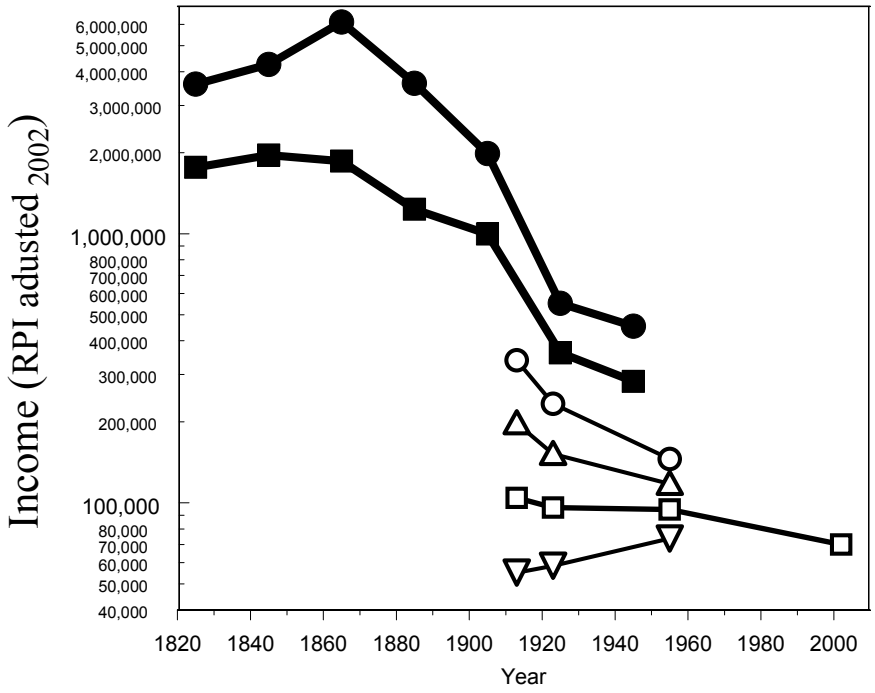
90000
80000
70000
60000
50000
40000
30000
20000
10000
1910
1920
1930
1940
1950
1960
1970
Year

S2a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5,000,000
4,000,000
3,000,000
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1,000,000
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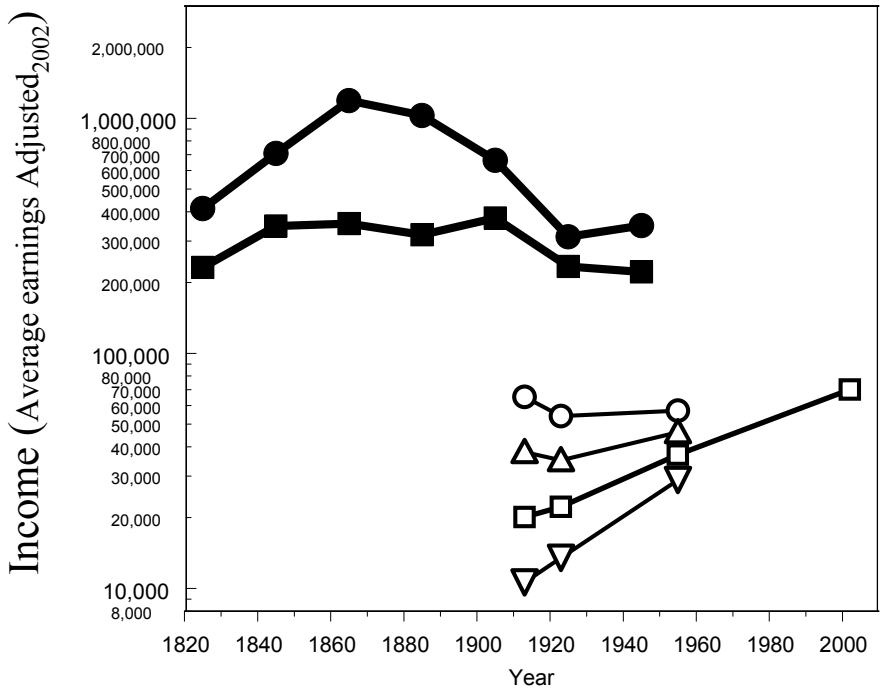
600,000
500,000
400,000
300,000
200,000
100,000
80,000
70,000
60,000
50,000
40,000
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
Year

S2b


Income (Average earnings Adjusted 2002)
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600,000
500,000
400,000
300,000
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80,000
70,000
60,000
50,000
40,000
30,000
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1840
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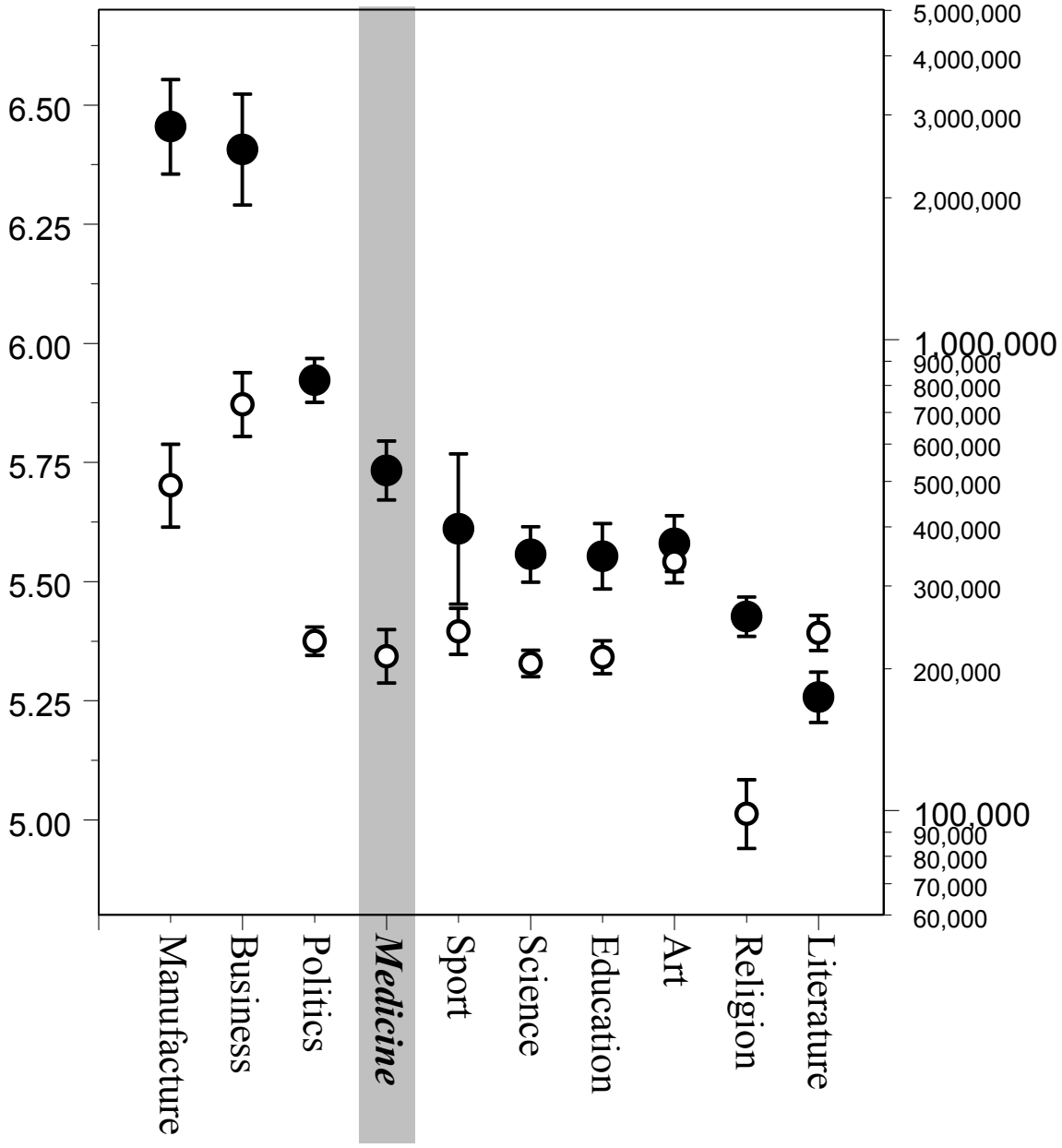
1880
1900
1920
1940
1960
1980
2000
Year

Figure S3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700,000
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300,000
200,000
100,000
90,000
80,000
70,000
60,000
Manufacture
Business
Politics
Medicine
Sport
Science
Education
Art
Religion
Literature

Table S1: Doctors in the ODNB who died between 1890 and 1899, ranked by wealth.

	Birth	Death	Wealth at death (£)	ODNB short description
Parke, Thomas Heazle	1857	1893	38	army medical officer and explorer in Africa
Hassall, Arthur Hill	1817	1894	55	physician and microscopist
Ralfs, John	1807	1890	96	surgeon and botanist
Hake, Thomas Gordon	1809	1895	123	physician and poet
Hogg, Jabez	1817	1899	243	ophthalmic surgeon
Chapman, John	1821	1894	337	publisher and physician
Price, William	1800	1893	400	physician self-styled archdruid and advocate of cremation
Jones, Charles Handfield	1819	1890	450	physician and histologist
Armstrong, Sir Alexander	1818	1899	478	naval medical officer
Clay, Charles	1801	1893	481	gynaecologist and surgeon
Cule 'Dr William Price of Llan	1801	1893	481	gynaecologist and surgeon
Nicholson, Brinsley	1824	1892	486	military surgeon and literary scholar
Shortland, Edward	1812	1893	506	physician and ethnographer in New Zealand
Jones, Thomas Wharton	1808	1891	876	physiologist and ophthalmic surgeon
Whitehouse, Edward Orange Wildman	1816	1890	1287	surgeon and electrician
Shaw, Alexander	1804	1890	1863	surgeon
Parker, William Kitchen	1823	1890	2095	comparative anatomist and zoologist
Aveling, James Hobson	1828	1892	2106	obstetric physician
Aitken, Sir William	1825	1892	2403	pathologist
Wallich, George Charles	1815	1899	3053	military surgeon and oceanographer
McCormick, Robert	1800	1890	3139	naval surgeon explorer and naturalist
Arlidge, John Thomas	1822	1899	3857	physician
Brookes, William Penny	1809	1895	3896	surgeon and campaigner for the revival of the Olympic games
Ross, James	1837	1892	4510	physician
Bentley, Robert	1821	1893	4988	botanist and pharmacognosist
Wilkinson, James John Garth	1812	1899	5302	Swedenborgian writer and homoeopath
Haughton, Samuel	1821	1897	5422	geologist and physiologist
Watson, John Forbes	1827	1892	5582	physician and expert on India
Kerr, Norman Shanks	1834	1899	5957	physician and temperance advocate
Buchanan, Sir George	1831	1895	7739	epidemiologist and civil servant
Hulke, John Whitaker	1830	1895	8018	surgeon
Little, William John	1810	1894	8173	orthopaedic surgeon
Thorne, Sir Richard Thorne	1841	1899	8379	physician and public health officer
Kingsley, George Henry	1826	1892	8618	physician and traveller
Munk, William	1816	1898	9056	physician and biographer
Tait, Robert Lawson	1845	1899	9571	gynaecological surgeon
Stratton, John Proudfoot	1830	1895	9946	surgeon and civil servant
Reynolds, Sir John Russell	1828	1896	11142	physician and neurologist
Thomas, Hugh Owen	1834	1891	11148	orthopaedic surgeon
West, Charles	1816	1898	11300	physician
Jago, James	1815	1893	11816	physician

Porter, Sir George Hornidge	1822 - 1895	12772	surgeon
Johnson, Sir George	1818 - 1896	14007	physician
Bristowe, John Syer	1827 - 1895	16119	physician
Bennett, Sir James Risdon	1809 - 1891	17441	physician
Sturges, Octavius	1833 - 1894	18024	physician
Hicks, Henry	1837 - 1899	18338	geologist and alienist
Down, John Langdon Haydon Langdon	1828 - 1896	19947	physician and expert in mental science
Monro, Henry	1817 - 1891	20752	physician specializing in the treatment
Bellew, Henry Walter	1834 - 1892	20868	army medical officer
Marshall, John	1818 - 1891	21359	surgeon and teacher of anatomy
Carter, Henry Vandyke	1831 - 1897	21561	epidemiologist
Taylor, Michael Waistell	1824 - 1892	22587	physician and antiquary
Carpenter, Alfred John	1825 - 1892	23019	physician and propagandist for the cause of sewage framing
Mackenzie, Sir Morell	1837 - 1892	23500	physician and laryngologist
Myers, Arthur Thomas	1851 - 1894	28056	physician
Wood, John	1825 - 1891	30585	surgeon
Owen, Sir Richard	1804 - 1892	33201	comparative anatomist and palaeontologist
Tidy, Charles Meymott	1843 - 1892	42914	sanitary and analytical chemist
Hewett, Sir Prescott Gardner	1812 - 1891	45133	surgeon
Bucknill, Sir John Charles	1817 - 1897	48274	psychiatrist
Sutherland, John	1808 - 1891	54542	physician and promoter of sanitary science
Sharp, William	1805 - 1896	54811	physician and homoeopathist
Wells, Sir Thomas Spencer	1818 - 1897	56377	gynaecological surgeon
Roberts, Sir William	1830 - 1899	73856	physician and physiologist
Paget, Sir James	1814 - 1899	74861	surgeon
Humphry, Sir George Murray	1820 - 1896	80199	surgeon
Walshe, Walter Hayle	1812 - 1892	81634	physician
Erichsen, Sir John Eric	1818 - 1896	89633	surgeon
Savory, Sir William Scovell	1826 - 1895	93190	surgeon
Bowman, Sir William	1816 - 1892	107607	ophthalmic surgeon and anatomist
Quain, Sir Richard	1816 - 1898	118121	physician
Gull, Sir William Withey	1816 - 1890	344022	physician
Jenner, Sir William	1815 - 1898	385083	physician

Table S2: Doctors in the ODNB who died between 1990 and 1999, ranked by wealth.

	Death	Wealth at death (£)	*ODNB short description*
Turnbull, Sir Alexander Cuthbert	1990	3669	obstetrician and gynaecologist
Gregory, Roderic Alfred	1990	6506	physiologist
Widgery, David John Turner	1992	9740	polemicist and doctor
Dawes, Geoffrey Sharman	1996	14737	physiologist
Phillips, Charles Garrett	1994	44511	neurophysiologist
Fry, John	1994	44931	general practitioner and medical author
Baum, John David	1999	82202	paediatrician
Bowlby, Edward John Mostyn	1990	88776	psychiatrist
Evans, Sir Robert Charles	1995	94135	surgeon and mountaineer
Hall, Reginald	1994	97140	endocrinologist
Neil, Eric	1990	121730	physiologist
Vaughan, Dame Janet Maria	1993	125000	haematologist and radiobiologist
Kaushal, Baldev Sahai	1992	125087	general practitioner
Winstanley, Michael Platt, Baron	1993	165929	physician politician and broadcaster
Dick, George Williamson Auchinvole	1997	180000	pathologist and virologist
Burkitt, Denis Parsons	1993	187936	surgeon and geographical epidemiologist
Illingworth, Sir Charles Freder	1991	190286	surgeon
Harris, Sir Charles Herbert Stuart	1996	192909	virologist
Wayne, Sir Edward Johnson	1990	195884	physician
Wilson, Sir John Foster	1999	200000	international health administrator
Clark, David Stafford	1999	200000	psychiatrist
Hopkins, Harold Horace	1994	221417	physicist and endoscopist
Pitt, David Thomas, Baron	1994	224380	general practitioner and politician
Hardisty, Roger Michael	1997	263046	haematologist
Tizard, Sir John Peter Mills	1993	268438	paediatrician
Smithers, Sir David Waldron	1995	274133	radiotherapist
Porritt, Arthur Espie, Baron	1994	293041	surgeon and governor general of New Zealand
Smith, Arthur Norman Exton	1990	293332	geriatrician
Blaschko, Hugh	1993	304886	biochemist and pharmacologist
McMichael, Sir John	1993	313982	cardiologist
Barcroft, Henry	1998	362253	circulatory physiologist
Cameron, Sir James Clark	1991	376037	general practitioner and medical administrator
Stallworthy, Sir John Arthur	1993	383258	obstetrician and gynaecologist
Whitteridge, David	1994	394708	physiologist
Pugh, Lewis Griffith Cresswell	1994	454107	physiologist and mountaineer
Loutit, John Freeman	1992	478106	radiobiologist and haematologist
Paton, Sir William Drummond Macdonald	1993	483483	pharmacologist
Illingworth, Ronald Stanley	1990	532004	expert in child health
Creak, Eleanor Mildred	1993	569308	child psychiatrist
Feldberg, Wilhelm Siegmund	1993	592228	pharmacologist and physiologist
McCance, Robert Alexander	1993	598367	physician and research physiologist

Adrian, Richard Hume, Baron	1995	693202	physiologist
Barnes, Dame Alice Josephine Mary Taylor	1999	748681	obstetrician and gynaecologist
Harrison, Sir Richard John	1999	800537	anatomist and marine biologist
Pochin, Sir Edward Eric	1990	887372	physician and specialist in the dangers of ionizing radiation
Himsworth, Sir Harold Percival	1993	921679	physician
Gilchrist, Andrew Rae	1995	937910	physician and cardiologist
Fraser, Sir Ian James	1999	1348875	surgeon
Sinclair, Hugh Macdonald	1990	1388172	nutritionist
Rosen, Ismond	1996	1672796	psychoanalyst and sculptor