Research Policy

The funding of medical research: going up or coming down?

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Everywhere the perception among medical researchers I met is that money for research is tight and that as a result good work that might be done is not being done. The Medical Research Council is having to turn down grant applications that are highly rated. Not enough money can be found to pay for the training of medical researchers, and many turn away from a career in research because the prospects are so poor. Academics are finding that they have little or no time for research, which is one factor driving some of them abroad. Well found laboratories are threadbare, and new equipment often cannot be afforded. Yet, seemingly paradoxically, more money is probably available for medical research than ever before—even in real terms (that is, adjusted for inflation using the gross domestic product deflator, the government's preferred method). The sources of the funds are, however, changing, bringing many implications for the future of biomedical research.

Figure 1 shows an estimate of how overall funds for medical research (which I define as any research that *might* contribute to improving the health of the people) are growing. The sources of

funds are varied and becoming more so. The rest of the article will explain how I have arrived at the figures, but all of them—except expenditure by the Medical Research Council—are informed guesses.

Funds from the MRC

The traditional source of funds for medical research is the Medical Research Council, and its funds are declining in real terms (excluding special funds made available for research into the acquired immune deficiency syndrome (AIDS)).^{1,2} Furthermore, inflation in the costs of the research councils is greater than general inflation and so the real decline in funds is steeper than the figure suggests (see appendix). Also, when funding research in universities the council is having to meet expenses that should under the dual support system be met from university funds.

FIG 1—Estimates of overall expenditure on medical research at 1981-2 prices from 1981-2 to 1986-7. (See text for how estimates are made but note that drug company expenditure is simply the expenditure that is not in house—that is, about 20% of all drug company expenditure on research and development.)

Sources of Medical Research Council income in 1985-6

Source	Amount (£000s)
Government grant in aid	122 310
Government departments:	
Overseas Development Administration	1 652
Health and Safety Executive	535
Department of Health and Social Security	265
Ministry of Agriculture, Fisheries and Food	27
Ministry of Defence	62
Others	9
Other bodies:	
European Commission	283
World Health Organisation	370
Brewers' Society/Alcohol Education Research Council	42
British Diabetic Association	124
Amgen	33
Agricultural and Food Research Council	105
Economic and Social Research Council	134
British Heart Foundation	81
Harrow Health Authority	31
United States Public Health Service	89
Institute of Cancer Research	30
Muscular Dystrophy Group	52
Others	1 103
Collaboration with industry	725
Total from sources other than grant in aid	6 855
Total income	129 165

About 95% of the MRC's funds come in its grant in aid from the government.^{3,4} It also receives money from various government departments, including the Ministry of Defence, and from various charities and international organisations, including the World Health Organisation and the United States Public Health Service and the brewers (table). Most of these funds are allocated to particular projects and are simply administered through the MRC. In 1985-6 the MRC also received just over £700 000 from collaboration with industry. This amount grew to £1.35m in 1986-7⁴ but still is very small. Both the government and the MRC expect it to grow.

FIG 2—How the Medical Research Council divided its expenditure between different forms of support in 1986-7.

FIG 3—Applications to the Medical Research Council for research studentships and number awarded from 1981-2 to 1985-6.

Figure 2 shows where the MRC's money is spent.^{2,3} About three quarters of it is tied up in units, institutes, staff, long term grants, international subscriptions, and unavoidable administrative expenses, which means that it is not easy to steer the ship that is the MRC in another direction. And now the Advisory Board for the Research Councils is advising the research councils to put more of their money into long term projects.⁵ Money has had to be saved by cutting the three year project grants and training awards: in the year ending 31 March 1986 the level of project grant awards was cut by 7.5% and numbers of research studentships were cut from 230 in October 1984 to 160 in 1985; advanced course studentships were cut from 100 to 70 and intercalated awards from 380 to 340. Funds for capital equipment had to be "seriously restricted," and about £2m of "high priority" requests could not be met.³ One of the most chilling figures in the latest annual report is reproduced in figure 3, which shows clearly the growing gap between those wanting research studentships and those who can be funded.⁴ You can watch the seedcorn being discarded.

In its latest advice to the government on how much it should spend on science through the research councils the Advisory Board for the Research Councils lists the economies that the MRC will have to make if it is not given extra funds to meet pay rises for academics and administrative civil servants: in 1988-9 there would have to be a 50% cut in project grants in order to protect the longer programme grants, but even so 20 of these would have to be cut; about 400 posts in universities would no longer be supported, and the already inadequate equipment allocation to MRC establishments would have to be cut by 20%.⁶

Many of the MRC staff in its institutes and units are on salaries, and even if the units are closed the staff are offered jobs elsewhere. The proposal arises—as it is repeatedly arising in universities—that perhaps the staff should not be so well protected. Not only does this fit in with the new entrepreneurial spirit that the British government is creating but also research is notoriously a young man's game and people do get "burnt out." Most of the researchers I spoke to thought that academic tenure would probably have to go, but those employed by the MRC were understandably unhappy with the idea that their tenure might be lost. One unit director pointed out to me that the material rewards of a career in research are already small (certainly compared with a career in the NHS topped up by private practice); research is by its nature a risky business, and to make careers depend on results would be to make life unbearably insecure; and, researchers are constantly reviewed in a way that, for instance, hospital consultants and general practitioners are not.

Another unit director thought that the MRC might do more to link up with universities so that those researchers whose productivity fell very low as they aged might find a place in universities teaching and administrating. Universities might not like the image of a retirement home for exhausted research workers, but they provide easier habitats for the old. Furthermore, the universities need research council funds, and the councils could thus drive hard bargains when siting a unit in a university.

Money from the universities

Under the dual support system the other main source of funds for research undertaken in universities is through the universities themselves from the grant they receive from the University Grants Committee. The overall UGC grant has declined appreciably in real terms, and as research is easier to abandon than teaching the decline in UGC funds used for research is probably greater than the overall decline (although the fact that a university's grant is now influenced by its research performance may check this trend). Furthermore, universities recognise that it is easier for medical researchers than for many other sorts of researchers to get funds from elsewhere, which means that the decline in university funds available for medical research is likely to be greater than the overall decline.

These statements have to be general because it is not possible to put an exact figure on the proportion of university funds that is spent on medical research. To make a guess at overall expenditure on medical research I have, however, produced figures by dividing the total amount given to the universities by the UGC for research (itself a notional figure) by the proportion of medical students to other students. (This is an artificial manoeuvre because most medical research is done by non-medical graduates.) The decline would be greater if it is indeed true that universities have directed funds away from medical researchers because of their greater ability to attract outside funds.

Money from other government departments and from the NHS

The Department of Health and Social Security spends over £20m a year on research, most of it on health services research. The department's research budget has been progressively squeezed and most of it is tied up in units. The Scottish Home and Health Department also has a research budget for health, roughly a third of which is spent on biomedical research. Its budget has also been squeezed.

The small amount that the Scottish Home and Health Department spends on biomedical research does have an equivalent in England and Wales—regional research funds. These are administered by regional health authorities and total about £8m a year. Originally the authorities had a specific budget for research, then the money was simply earmarked, and now it is no longer earmarked. This may mean that in some regions at least the money is no longer used to fund research.

These funds—in England and Wales and Scotland—have mostly not been used to fund long term research. Rather they are another source of seedcorn money for people who have bright ideas, want relatively short term funds, and are mostly just beginning in research. In Scotland at least the funds are distributed with as much rigour as the MRC uses, but still I can see that with the new enthusiasm for managing research these funds must be vulnerable. The MRC spent only £21m on project grants in 1985-6, and some would argue that more value for money would result from the MRC having roughly £30m to spend on project grants than from the MRC having three quarters of the money and the 14 regions and Scotland dividing up the rest among them. The reality may be, however, that in England and Wales much of the money will simply be lost to research.

Money from other governmental bodies

Various governmental bodies such as the Public Health Laboratory Service, the Health and Safety Commission, and the Health Education Authority also spend money on research, most of which would fall into my wide definition of medical research. The Health and Safety Commission, for instance, spends over £6m a year on what it calls "research, testing, and agency services."⁷

Money from the medical charities

All the sources of funds mentioned so far are falling, but the money that comes from the medical charities is growing fast—not least because of the stockmarket boom that preceded the crash before Christmas. For instance, after the flotation of just over 20% of the share capital of the Wellcome Foundation the Wellcome Trust has some £200m, which it invested and which in 15 months rose in value to £270m. What all this means in terms of money available for research (and the trust's other activities) is that it will rise from just over £25m in 1984-5 to about £41m in 1987-8 (although the fall in the stockmarket fall may have reduced this figure).⁸

Many of the big charities that fund medical research are members of the Association of Medical Research Charities, and their total contribution to medical research trebled in the six years to 1985 from £33m to £110m.^{9 10} This rate of growth may well be maintained for a little longer, and at the beginning of 1986 the Office of Health Economics was predicting that by 1987 the funds available from members of the association would reach some £133m.⁹ This may even prove to have been a conservative estimate, and some charities, both large and small, do not belong to the Association of Medical Research Charities. For instance, the Yorkshire Cancer Research Campaign does not belong and yet has funds of about £2m a year. Another group with large funds are the special trustees of the London teaching hospitals. They are rumoured to have about £20m a year to spend, although exact figures are impossible to find. Much of the money is believed to be spent on equipment that is used more for service than research work. This may be increasingly true of many potential research funds.

Overall expenditure on medical research by the medical charities in 1987 will thus certainly be higher than that of the MRC.

Funds from industry

Funds from the drug industry for research are also expanding rapidly. In 1976 the industry spent about £100m on research. By

1985 the figure had risen to £550m, and the figure for 1987 is expected to be about £650m. Most of the money is spent "in house" on developing and testing new compounds,¹¹ but, according to Dr John Griffin, director of the Association of the British Pharmaceutical Industry, about £50m is spent each year on basic research, some of it in universities and research institutes. In addition, all of the money spent by drug companies on premarket and postmarket testing and half of the money spent on volunteer tests is spent extramurally. This means that at present more than £100m is being spent by drug companies on research and development in universities, research institutes, and the NHS.

My attempts to find out how much the medical equipment industry spends on research proved fruitless—and so did those of a committee of the Advisory Council for Applied Research and Development (ACARD) that investigated the industry.¹² The industry is much more diverse than the pharmaceutical industry but can be roughly divided into companies producing imaging equipment, diagnostic laboratory apparatus, electronic equipment, and prostheses. Together they have an estimated turnover of £1 billion, but the little evidence available suggests that they may be severely underinvesting in research. The ACARD committee said: "We are very concerned at this picture, which suggests R & D levels wholly inadequate to maintain and develop the UK's position in a rapidly moving industry."

I have thus not included any money from the medical equipment industry in my estimate of overall spending on medical research, but it might well be that this is a potentially rich source of funds for certain sorts of research—and patients and British industry might both benefit.

Funds from abroad

Funds from abroad for research are also expanding. The European Community has had a medical research programme since 1978: the first programme ran from 1978-81 and 100 research teams participated; the second ran from 1980-3 with 230 teams participating; and the third ran from 1982-6 with 1400 teams. In 1985 Britain had more teams participating than any other member of the community. The fourth programme is to run from 1987 to 1989 and 37m European currency units are being requested from the community.

More and more British researchers are also receiving funds from the National Institutes of Health in the United States and from various American charities. Funds are also available from European charities.

Other sources of funds

There are still further sources of funds for research, and no list could ever hope to be complete. Two other sources that occur to me are the Health Promotion Trust, which has £11m of tobacco industry money to spend,¹³ and the Brewers' Society, which spends at least £350 000 a year on alcohol research. It also funds research through the Medical Council on Alcoholism and the Alcohol Education Research Council. The Scotch Whisky Association also funds research, and so do other alcohol manufacturers. I mention these details simply to offer some insight into the extraordinary diversity of the sources of funding for medical research.

Implications of the changing sources of funds

This changing pattern of the source of funds for research carries many implications, which are only just beginning to be faced. One is the irony that just at the time when the worldwide trend is towards managing national research efforts (a trend that the British government is strongly supporting), the scope to manage medical research in Britain is declining—because the sources of funds are diversifying. Furthermore, the one large government source of funds that might be managed more rigorously—the MRC—has ever

less room to manoeuvre as an increasing percentage of its funds is effectively committed.

One of the primary questions being asked by the subcommittee of the House of Lords Select Committee on Science and Technology currently inquiring into medical research is how priorities are set. The only answer can be that even if priorities were set "scientifically" within the many funding organisations the overall setting of priorities has to be largely haphazard. This will probably have to change if Britain's biomedical research effort is to be more coordinated, and the Association of Medical Research Charities has suggested in its evidence to the House of Lords committee that there needs to be a national forum for linking those funding research.

At the moment various committees link the MRC, the health departments, the charities, industry, and the Commission of the European Communities, but most are simply talking shops, and some of the organisations are notoriously wary of each other. Some coordination takes place at a lower level, not least because there are only a limited number of medical researchers, but this is probably not enough. Each organisation tends to guard its independence, and the charities in particular are very anxious not to be seen as "deficit funders" for the MRC.

In fact it would make more sense for the MRC to deficit fund the other organisations funding research, and to some extent this already happens—the MRC has limited its research into cancer because of the enormous strength of the cancer charities compared with the other charities.¹⁴ Together the charities have a strong bias towards funding research into cancer and heart disease, and various sorts of researchers—for instance, those working on mental health and aging—find it much more difficult to get research funds from the charities. Several factors, including sometimes geographical ones, restrict the way in which the charities can spend their money. Many are related to particular diseases, and the British Heart Foundation, for instance, obviously cannot spend money on schizophrenia. The relation to particular diseases also means that many of the charities have a bias towards clinical research, although the Association of Medical Research Charities believes that overall the charities spend more of their money on basic research than on clinical research. Another factor is that although the funds of the charities altogether are large, many of the individual charities are small and their funds unpredictable. They are thus unenthusiastic about funding long term research and reluctant to fund training, although the charities are increasingly funding both.

These considerations thus suggest that the MRC should concentrate on basic research, long term research, training, and research into subjects such as mental health and aging. It does in fact have a bias towards long term and basic research, and it has been much concerned with training research workers, although this expenditure was being cut until the arrival of the new secretary. Its record on research into mental health and aging is not so impressive. What does seem important, however, is that the many organisations funding research should develop stronger links and plan more together. The Association of Medical Research Charities has now reconstituted itself as a charity and has a secretariat and executive and scientific councils. It is busy forming links with other bodies that fund research and with increasing its own membership.

The large amounts of money available from the drug industry for research must have a strong influence on the setting of research agendas within university departments, particularly clinical departments and those with some sort of link with drug related research. I spoke with researchers in basic science departments who did particular drug related projects because they knew that they would be funded by drug companies, and much research in clinical departments is designed in order to get drug company funding. Much of the research sponsored by the drug companies within hospitals and universities is humdrum sort of work that often simply demands doing a clinical trial and following a protocol written in Switzerland. The work has to be done, but I worry that the ease of getting money from drug companies and the difficulty of getting it from the MRC may stifle creativity.

Something that worries the drug companies themselves is that researchers (usually doctors) dash off drug company research and use the money to do research that "interests them more" or to fund

FIG 4—Estimates of overall expenditure on medical research at 1981-2 prices from 1981-2 to 1986-7 using an inflation figure of 10%.

activities that are not research at all. Some have even gone so far as to falsify data, and complaints have been made to the General Medical Council. The result of such activities might be that the drug companies reduce their expenditure on research within British universities and hospitals. The industry also mutters regularly about taking much of its research funds elsewhere if the government is not more understanding in its overall policy towards pharmaceuticals. This might be a great loss because four of the world's five best selling medicines were discovered and developed in the laboratories of British drug companies.

Conclusion

The impression among most medical researchers is that funds for medical research are falling in real terms. This is certainly true of funds that originate from the government, but the many other sources of research funds are increasing—and overall I estimate that funds for medical research are increasing in real terms. The unresolved question of the rate of inflation in medical research is, however, of central importance. The National Science Foundation in the United States has estimated that it may be 10%, and figure 4 shows how figure 1 would look if recalculated using an inflation rate of 10% rather than the government's preferred method; the budget of the MRC is then seen to be declining appreciably and overall expenditure is increasingly only a little.

The ascendancy of the research charities as a source of funds and the relative decline of the MRC means that links between the various groups must be strengthened and plans better coordinated. It may be the future of the MRC to fill in the many gaps left by other sources of research funds.

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