

Raising aspirations for medicine and other health care science careers – a role for the Trust

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Abstract

This paper examines science education, access to medical school and how they link to socio-economic deprivation in Co. Durham, a relatively deprived area. Issues around education and deprivation are raised in national statistics but when a number of issues interact in a single locality the result may be much worse and more difficult to overcome than is generally realised. This picture is unlikely to be unique to one area.

Educational attainment is inversely related to socio-economic status. The achievement gap widens as children progress through the system. Take up of science options is particularly poor and difficulties are compounded by lack of relevant science based work experience in deprived areas. The interaction of these factors is examined in some detail in an area of socio-economic deprivation.

High attainment in sciences is usually considered a core requirement for acceptance into medicine and widening access to medicine for school leavers is therefore very difficult in these circumstances.

A partnership between hospitals and local schools, including science based work placements, is described. Co-operation between the NHS and schools by provision of work experience and teaching materials could help to address these issues as well as likely staffing difficulties in other health care science careers in the future. Expenditure can be justified on the grounds of known links between health, education and employment.

Key words: widening access medicine, raising aspirations sciences, NHS outreach schools, socio-economic disadvantage A levels

Background

Widening access to higher education is a priority for UK universities and is chiefly about levelling the playing field for students who are socio-economically disadvantaged. Widening access to medicine is particularly difficult because of the very high academic requirements and competitive selection process. Low attainment at A level in socio-economically disadvantaged areas is a major difficulty and is associated with a number of factors: low aspirations, adverse peer group pressure, difficult teacher recruitment and lack of parental support. National statistics show this clearly¹ but may not reveal the depth of the disadvantage suffered in some localities. Research has shown that raising aspirations in disadvantaged groups is key to both these challenges². Low aspirations may be only too obvious: A boy in a science class who greatly enjoyed learning about the heart through

an animal dissection said at the end: "Perhaps I could be a butcher" (personal communication, S. Dodds).

In the NHS, recruitment is an important challenge for many professions, especially those that are science-based. Current publicity about redundancies is likely to be replaced by concerns about staffing levels within a few years as school rolls fall, the population ages and expected retirements take place. Within the NHS, the issue is seen as one of widening participation (rather than access) – people not taking up the opportunities provided for higher education and careers in the NHS.

Education and socio-economic deprivation in Co Durham

County Durham includes some of the most deprived wards in England and a number of these are in the worst 10% of wards (highest score on the index of multiple deprivation – an index which incorporates the effects of poor health, unemployment, income, educational attainment, crime and environment³). In these wards it is recognised that access to good health care is unsatisfactory, illustrating the "inverse care law"⁴ very clearly, though attempts are being made to address this. Fig 1 shows these areas and also indicates the location of primary schools which are not achieving government targets in literacy, numeracy and science at Key Stage (KS) 2 prior to entering secondary education. These schools are very closely associated with the disadvantaged areas.

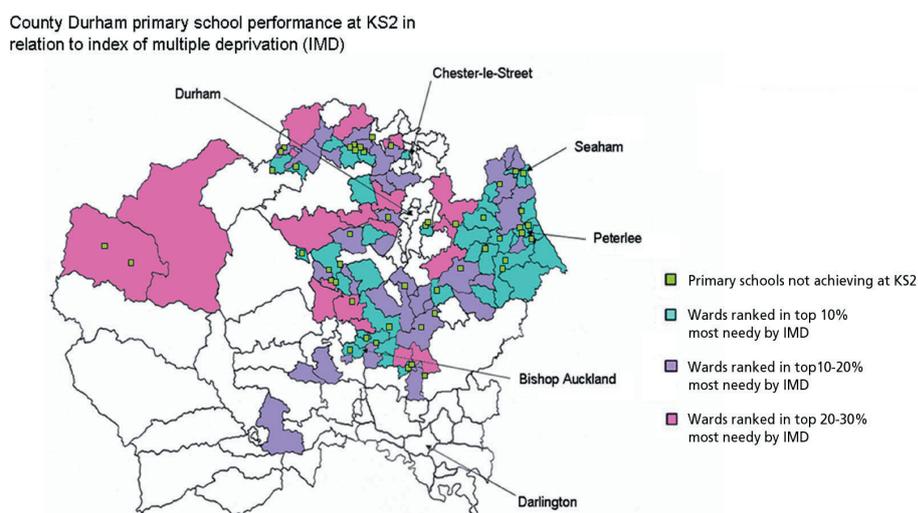


Fig 1. Map of Co Durham showing areas of high index of multiple deprivation (IMD). Small squares indicate primary schools not achieving government targets at Key Stage 2.

Fig 2 shows how students progress through school at different stages – the gap at KS 1 widens progressively and is more marked when higher achievements are considered. In the county half the schools, mainly in the most deprived areas, do not have sixth forms, depriving younger students of aspiring role models.

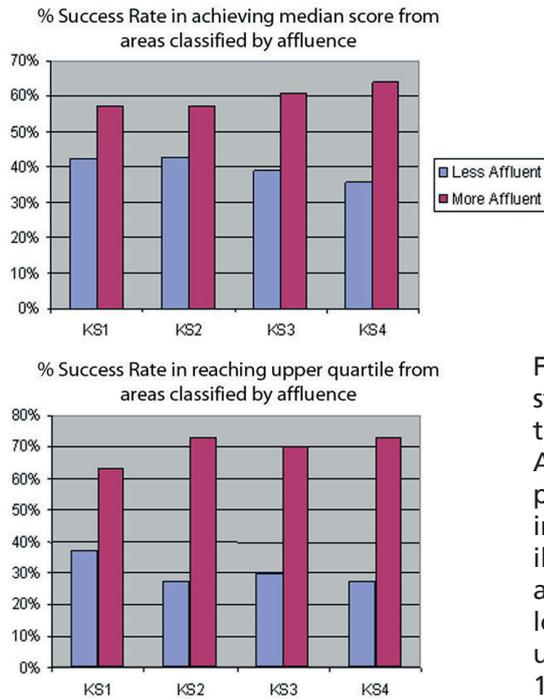


Fig. 2: Comparison of the success of students in the less affluent 50% of the population (by Income Deprivation Affecting Children Index 3) in reaching particular levels at different stages in their education. The upper panel illustrates success in achieving the approximate median mark while the lower graph success in reaching the upper quartile of marks. Key stage (KS) 1 represents start of primary education while (KS) 4 represents year 11 – GCSE.

In 2003 Ofsted reviewed the Co Durham Local Education Authority (LEA) and made the following comments:

"County Durham is the most deprived English county and among the most deprived quarter of local authorities nationally.

Only 17 of 35 secondary schools have sixth forms and many of those are too small to be efficient.

The staying on rate post 16 is the lowest in England."

The Local Education Authority has made strenuous efforts to improve the staying-on rate and it has improved since this report to the extent that it is now better than in some other areas. Two of the smaller sixth forms have now closed

This pattern is likely to be replicated in many socio-economically disadvantaged areas.

For application to medicine and many other NHS careers sciences are

essential; it is therefore a matter of grave concern that few pupils in these areas, if they stay on in education after 16, take up science subject options at A level. Accurate figures are not available because of cross-boundary movements but in 2005, 84 of a GCSE cohort of about 6000 students took A level biology and chemistry. Only 10 of these were from the less affluent half of the county. Science A/B grades come almost exclusively from more affluent areas so it is clear that very few would get A/B high grades in sciences from a less affluent area. We identified four, none of whom is doing medicine. Any attempt to improve this situation would require interventions well before GCSEs.

Widening access to medical school

The Council of Heads of Medical Schools strongly supports widening access to medicine and issued the following statements in 2003:

Understanding science is core to the understanding of medicine.

Medical schools will be pro-active in reaching out to all sections of the community.⁹

From the preceding paragraphs these statements appear to be in conflict and it can be seen how difficult widening access to medicine is likely to be where it is most needed. One might add that it is reasonable to deduce that the same applies to many other science based careers in the NHS. Meanwhile in the community there is persisting unemployment.

Research has shown that for given A level grades students from the state sector perform better at university than those from the independent sector⁵. However the work was done before the current drive to widen access and for disadvantaged groups it is reasonable to postulate that the difference could be greater. Medical schools have shied away from accepting disadvantaged students with lower A level grades (coupled with other selection tests) and as A levels are no longer regarded as sufficiently discriminating it has been suggested that the hurdle be raised to AAA or starred A levels because of the larger number of students getting top grades in recent years⁶. Some have set up a "year 0" for disadvantaged students to which those with much lower A levels might apply if judged to have potential. Others have focussed their efforts towards widening access through graduate entry and recognised access courses which cater for mature students, not school leavers.

Raising aspirations - the place of work-based learning in the school curriculum

Work experience is compulsory in KS4 - the 14 –16 year age group. Its potential for motivating and enhancing self-esteem is recognised⁷. At this stage students are making substantive decisions about post-16 options, though the process of decision-making starts much earlier.^{8,9} New science curricula^{10,11} emphasise an applied approach to teaching science and provide opportunities for the NHS to be introduced into the curriculum. Common clinical conditions such as diabetes, asthma and heart disease are included and the teacher is expected to link teaching with local careers opportunities.

At present only 2% of employers in this area offer science based work placements and 0.6% of pupils are taking up opportunities for work experience in sciences or technology (fig 3) though lack of availability may be a factor. Work experience in medicine is difficult to get and tends to be given to older students who are also the friends and family members of doctors. Medical schools do not insist on NHS work experience but it is widely perceived as essential and lack of it as a disadvantage when applying. Thus already disadvantaged students feel further disadvantaged for medicine.

Durham LEA Placements by Occupational Category 2004/05

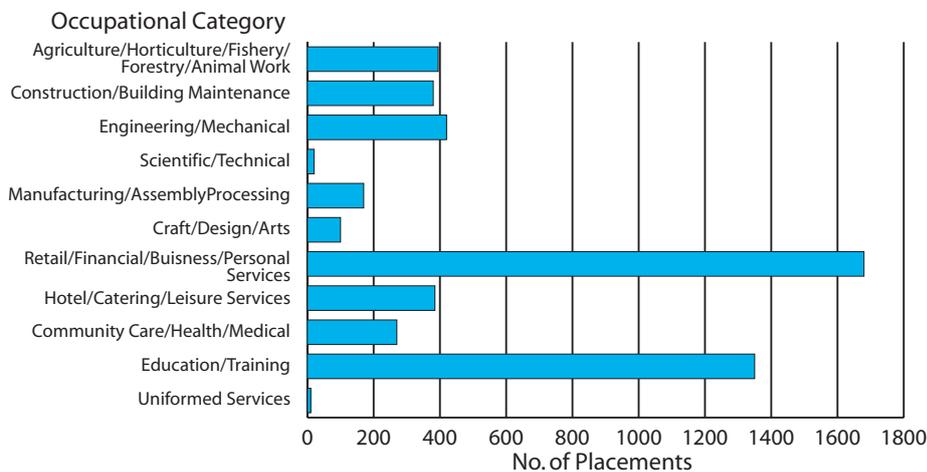


Fig 3: Work experience placements in County Durham in 2004-5 by occupational category

NHS support for the science curriculum

Energetic support of science teaching by the universities and NHS from as early a stage as possible could be motivating and help to raise aspirations. There is some evidence that this might be effective.^{7,9,12,13}

Work placements provided by the NHS in as many science areas as possible and from 14 onwards would raise the profile of other NHS careers besides medicine (giving students an alternative career if they do not in fact achieve grades for medicine). The risks of doing this perceived by many in the NHS (emotional trauma, confidentiality, "running loose!") need to be balanced against the opportunity costs and risks of not staffing these areas in the near future. Whatever approach is taken, investment in promoting links between the NHS, schools and employment opportunities can be defended on the basis of recognised links between health, education and employment¹⁴.

Provision of work placements and other outreach activities to schools appeals instinctively to staff who are often parents themselves and trained communicators at all levels. The chief concern in this trust is that students are often poorly selected for placements. We have therefore introduced a competitive selection process (based on motivation and potential as judged by the teachers) in which we take 4 students from each of eight schools around Co.Durham and Darlington and offer them structured placements in the three hospitals of the trust with work books to complete, together with career days for the whole class (The William Harvey Project – see Box 1).

Box 1: Hospitals and their link schools

UHND -	Framwellgate Moor Spennymoor Gilesgate Durham Community Business College
DMH -	Woodham Greenfield
BA -	Tudhoe Grange Teesdale

They are also given opportunities to visit local university campuses for science or biomedical science demonstrations. Linked with this problem based learning materials have been developed (analogous to the approach now taken by many medical schools) which focus around clinical scenarios such as a 15 year old boy with asthma (Box 2). This approach has been very well received by teachers and school students and now forms the basis of a module of professional development for teachers in this area. Early indicators are that teaching around a clinical scenario can be motivating¹³.

Box 2: Solve Gary's Problem

Gary is 15. Recently he has become short of breath and finds he can no longer do cross-country running (which he never liked). His father thinks he's lazy. His mother is worried. He has also fallen off his bike and hurt the left side of his chest. He now has chest pain. He has started to smoke a few cigarettes a day but his parents are unaware of this.

His sister has hay fever but otherwise they are a healthy family.

His mother takes him to the doctor who can't find anything wrong and sends him to the hospital for tests.

What might be wrong with Gary?

The students identify the main issues (he has chest pain and is short of breath) and then have to suggest possible diagnoses (they usually think of asthma, heart problem, fractured rib, punctured lung, cancer) and have to consider how they might find the answer, first by discovering how the relevant organs work and then how they might be investigated. They learn about body mass index, chest x-rays, ECGs, echocardiogram, lung function tests and oxygen transport to tissues. They can also be introduced to relevant NHS careers. Links to other parts of the curriculum can be exploited.

Early outcome measures of our partnership with schools will be the post-16 choices made by the enrolled students. The ultimate aim is to ensure recruitment of high quality local staff to the trust while at the same time the rich variety of NHS careers will be effectively publicised to schools. Health education is an additional benefit. The whole project will also support local efforts to widen access to medicine.

Challenges

Outreach to schools is not at present perceived by the NHS as "core business" but within the next few years the need for this is likely to become obvious. It requires committed leadership. At present our own work is charitably funded but a good case can be made for funding to be shared by hospitals, primary care trusts and the education sector.

Evaluation of educational interventions is very difficult as good controls (same school, teacher and other variables) are not available.

It is clear that the interventions offered are highly appreciated and our second intake is over-subscribed. We will be examining post-16 choices closely and comparing them with controls matched by age, predicted grades and socio-economic status.

Conclusion

Widening access to medicine for school leavers in disadvantaged areas is very difficult because of a number of interacting factors. Links with the NHS can enliven the curriculum and has the potential to raise aspirations for medicine and other science based NHS careers. Expenditure can be justified by accepted links between health, education and employment. It is a role which hospitals can and should perform.

Summary points

Students from areas most in need of health care have the least opportunity to gain the educational achievements required for entry into medical school.

Educational attainment is closely linked to an index of multiple deprivation and is lower in deprived areas.

Take-up of science options is also low in those areas and work-based learning in sciences is either not available or not chosen.

High attainment in sciences is a core requirement for acceptance into medicine.

Efforts to widen access to medicine must address these issues and co-operation with the NHS could be productive.

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