A-level grades and medical school admission

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Over the past decade there has been a rapid increase in the A-level grades required for admission to British medical schools. This has worried those concerned in selecting and preparing potential students. The explanations put forward for this sudden increase in grade requirements are speculative and usually take one of three forms: there has been an inflation of A-level grades, and an A grade has become devalued; there has been an increased demand for medical school places, perhaps due to a worsening economic climate, and hence medical schools can afford to select only the best students; and there has been a structural change in the method of selecting medical students. This structural change may be due to a policy in some medical schools not to interview candidates but instead to set high A-level requirements, thus allowing the A-level examiners to do the actual work of selection and simultaneously pushing up entrance requirements; to an increasing tendency to offer conditional places before students have taken A levels; and to a tendency to take a higher proportion of candidates without A levels in biological subjects. I have examined available statistics to attempt to distinguish these hypotheses.

I have assumed—for convenience and in the absence of more adequate statistics—that students in general take A levels at the age of 17 and enter university at 18. Figure 1 (top) shows the basic phenomenon to be explained. Between 1969 and 1980 there was a rapid increase in the proportion of entrants to medical school with 13 or more A-level points from three A levels (the system of calculation gives five points for an A grade, four for a B, etc; few students enter medical school with only two A levels). In particular, the rise was sharp for men entering between 1969 and 1975, though the same effect was apparent for women. For

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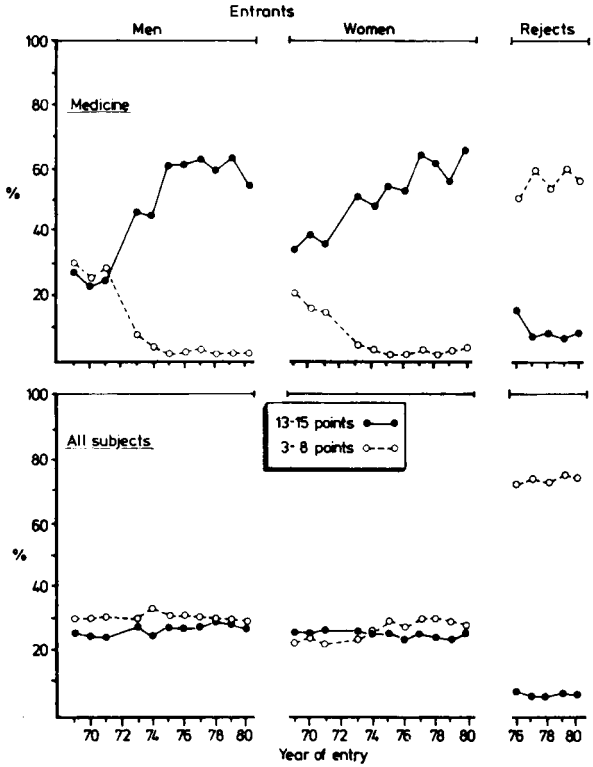

FIG 1—Top: Proportions of men and women candidates entering medical school each year with 13 or more A-level points or under nine A-level points (based on three A levels), and proportions of applicants rejected. Bottom: Similar figures for all university entrants. (Data for 1972 were not published.)

the period 1976 to 1980 requirements were steady; over the same period, the only one for which data are available, the qualifications of applicants rejected were also stable. For comparison (fig 1 (bottom)) the A-level grades of successful and unsuccessful applicants for all university places have been stable for more than a decade.

Has there been inflation in the value of an A-level grade? Figure 2 (top) shows the proportions of students taking science A levels who gain particular grades. These proportions are remarkably constant, and I suspect that the examiners arrange the system so that this will be the case. Over the period of this constancy in grade proportions, however, there was a large increase in the number of entries for A-level exams, particularly among women (fig 2 (centre)), though the increase was relatively less for science subjects. The position is complicated further by variation in the size of the eligible population of the correct age (17) for taking the exams (fig 3) due to large fluctuations in the postwar

birth rate. So when we examine A-level entrants (assuming, on average, three subjects per person) as a proportion of the eligible population (fig 2 (bottom)) it is clear that since 1970 the percentage of men taking A levels has been constant, and, particularly for science subjects, there has been almost no systematic change in either sex. Hence the proportions in fig 2 (top) are applied to populations of roughly equal ability, and inflation should be of little consequence, assuming that there has been no large-scale shift of pupils of higher ability from non-science to science subjects. Furthermore, any inflation of A-level grades has been relatively gradual and hence is unlikely to have accounted for the sudden dramatic shift shown in figure 1 (top).

Increased demand?

Could the sudden rise in obtained A-level grades have been caused by an increased demand for medical school places? Figure 4 shows the absolute numbers of individuals putting medicine first on their Universities Central Council for Admissions (UCCA) form. It is clear that between 1970 and 1973 there was indeed a rapid rise in demand for places, and that this coincided with the rapid rise in A-level grades obtained. Over the same period, however, there was also an increase in the number of students going to university and, particularly, to medical school (fig 5). Nevertheless, these latter rises are fairly smooth, unlike the sudden discontinuities in figs 1 (top) and 4. This suggests that the sudden rise in obtained A-level grades between 1970 and 1974 was a result of increased demand for places. More problematic is the question of whether the sustained high level of obtained A-level grades since 1973-4 can be attributed to increased demand. The absolute numbers putting medicine as their first UCCA choice fell continuously from 1974, and since this period coincided with an increase in the eligible population (fig 3) the proportion of the eligible group applying fell relatively more quickly. Over the same period there was also a 12% increase in the number of medical school places available (fig 5 (top)). Thus, despite a fall in demand and an increase in supply, the obtained A-level grades remained consistently high. It seems unlikely that this can be explained by a better-qualified set of candidates applying to do medicine—for example, due to an overall shift from non-vocational to vocational courses—since on the basis of the rather limited data available the obtained A-level grades of rejected candidates over the same period also remained static (fig 1 (top)). The most reasonable explanation, therefore, seems to be that there has been a structural change in the method of selecting candidates. One possible explanation would be a shift of emphasis from interview and personal assessment to an emphasis on A-level grades, and that this structural change was itself induced by the sudden rapid rise in demand for medical school places over the period 1969-73. An alternative

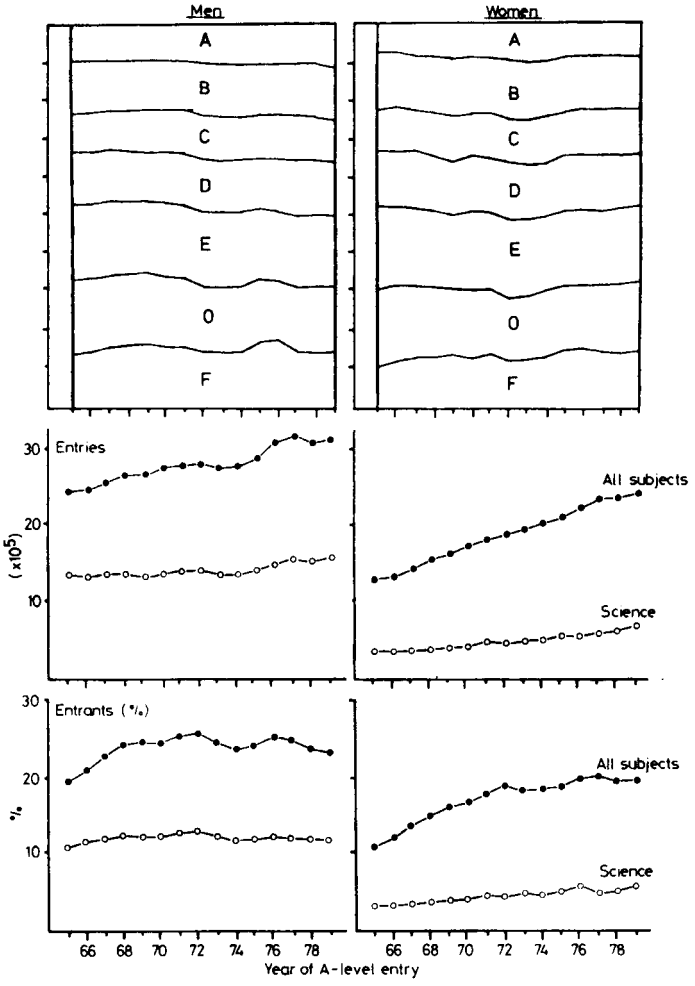

FIG 2—Top: Proportions of students taking science A-level subjects gaining particular grades, by year of taking exams. Centre: Total number of A-level entries (that is, subjects, not candidates) for all subjects and for only science subjects. Bottom: Estimated percentage of population of appropriate age taking A levels.

explanation might be that over recent years there has been a shift in the type of applicant being accepted, with, in particular, a growing proportion of applicants without an A level in biology. There are no adequate statistics on this phenomenon, but it might well be that by accepting candidates without an A level in biology the effective pool of possible medical students is enlarged, and hence in selecting a relatively fixed number of applicants a higher proportion with high A-level grades can be selected.

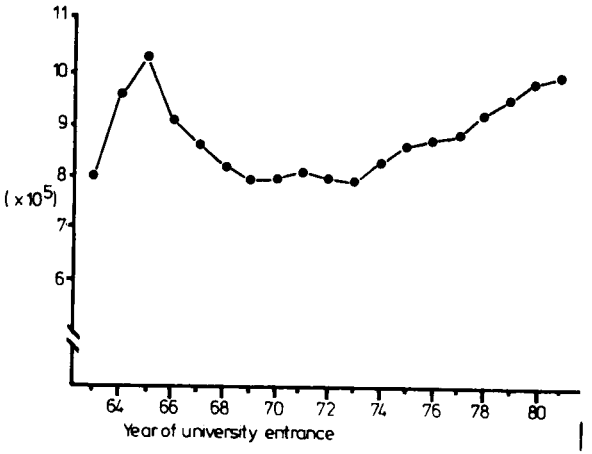

FIG 3—Effective population who would be of appropriate age for university entrance in particular years, assuming entry occurs at age 18. (Data derived by lagging birth statistics, with no correction for mortality.)

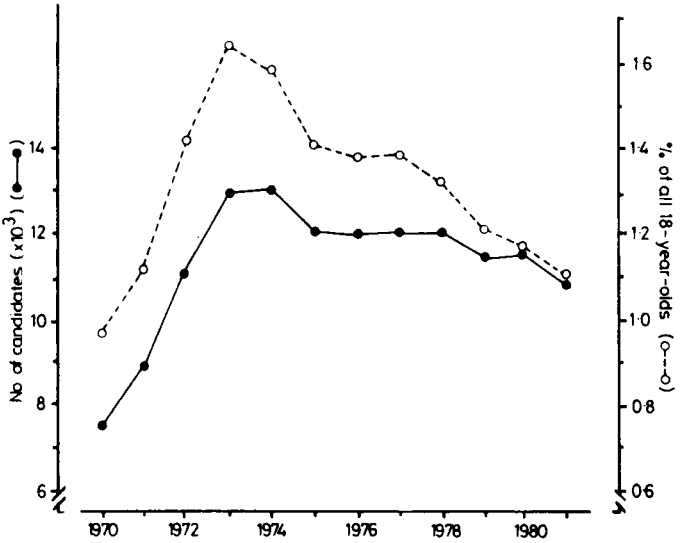

FIG 4—Absolute number of candidates each year putting medicine as first choice on their UCCA form, and percentage of individuals of an appropriate age putting medicine as their first UCCA choice.

There is little evidence about whether high obtained A-level grades indicate an increased likelihood of success at a preclinical or clinical course, or an increased competence or ability in the actual practice of medicine. Studies have found only small correlations between A-level performance and subsequent success in medical schools,[1-3] typical correlations being of the order of 0·25 (accounting for about 7% of total variance) and showing a tendency to predict performance less well as the student progresses through medical school. Thus in a survey of entrants to St Mary's Hospital Medical School over the period 1975-8 a small correlation was found between total A-level grades and performance in first-year exams ($r=0{\cdot}1986$, $n=369$, $p<0{\cdot}001$), and a smaller non-significant correlation between A-level grades and success in second-year exams ($r=0{\cdot}0978$, $n=272$, NS) (P Williams, unpublished results). In another study of London medical students[3] the main predictor of success at 2nd MB was an A level in biology, with physics and chemistry having no independent predictive value. In America, Medical College Admission Test scores have been shown to have little predictive value for eventual success at medical school.[4] In non-medical students A-level grades seem only to predict first-year results and not second- and third-year results.[5,6] In part, of course, such negative findings reflect a small variance in obtained A-level scores.

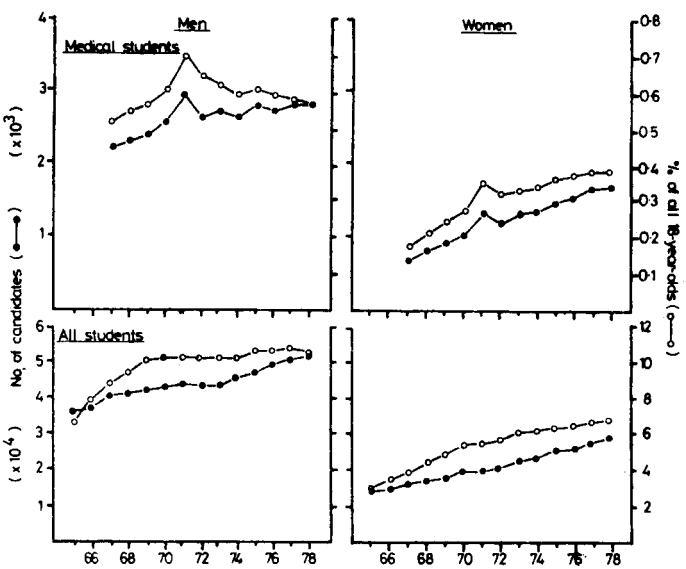

FIG 5—Top: Absolute numbers of individuals entering medical school each year, and that number expressed as a percentage of the total population of individuals of appropriate age. Bottom: Absolute numbers of students entering university to study all subjects, and that number expressed as a percentage of the appropriate age group.

I suspect that candidates with, say, two E grades at A level would have difficulty in completing the course (though this is not necessarily the case in other disciplines, where cognitive style is of greater predictive value).[7]

There is no evidence that the recent increase in A-level grades obtained by medical students can be attributed to an inflation in the grades, and an increased demand for medical school places can explain only a proportion of the effect. Hence a structural change in the method of selecting medical students must also be invoked in explanation.

Statistical note—The statistics in the present paper were derived from several sources. A-level entries and grades are from volume 2 of the annual *Education Statistics* (HMSO) and the figures on entrants to universities from volume 6. Information on UCCA preferences and obtained A-level grades of candidates are from the annual *Statistical Supplement of the Annual Report of the Universities Central Council for Admissions*. Estimates of cohort sizes are based on figures published by the registrar-generals of England and Wales, Scotland, and Northern Ireland.

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