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## Standards Medical Students Set for Themselves when Preparing for the Final MBBS Examination

MP Senanayake,<sup>1</sup>MD, MRCPC (UK), FRCP (Lond), DSG Mettananda,<sup>1</sup>MBBS

### Abstract

**Introduction:** Determining whether the standard of an examination is appropriate is a difficult task. It is important for examiners and examinees to be aware of the standard of the examination. We compared the examination standards perceived by medical students with that of the examiners. **Materials and Methods:** A descriptive comparative study was carried out on a sample of final-year medical students from the Faculty of Medicine, University of Colombo. All final-year students of a given year of intake were requested to devise true/false type, negatively marked, 5-response multiple-choice questions at a standard they thought suitable for students sitting the final MBBS examination in Paediatrics. Ambiguous and wrongly worded questions were excluded. A “mock” multiple-choice question paper of randomly selected student generated multiple-choice questions was held a fortnight prior to the final paediatric examination. The students were unaware that the multiple-choice questions in the “mock” examination had been devised by their peers. Marks obtained at the “mock” and final examinations were compared and the difficulty index was calculated for both papers. **Results:** Correlation between marks obtained at the 2 multiple-choice question papers was moderate ( $r = 0.67$ ) and significant ( $P < 0.01$ ). The mean marks for the “mock” examination, 47.1% [standard deviation (SD)  $\pm 9.2$ ], and for the final examination, 58.9% (SD  $\pm 8.7$ ), showed a statistically significant difference ( $P < 0.0001$ ). **Conclusion:** This study showed that student-set multiple-choice questions correlated significantly with those of the university but were of a tougher standard.

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**Key words:** Examination standards

### Introduction

The standard of the examination is all-important to the examinee. However, the setting of standards is often arbitrary and without guidelines.<sup>1</sup> Even equally experienced, like-minded examiners disagree on the delineation between passing and failing due to the uncertain standard of the examination. No examination can fulfil its objectives without the examiners and examinees both agreeing on the standard. An important component of medical education is setting, maintaining and reassessing standards periodically.

We carried out a study to assess the standards medical students set for themselves and for their peers when preparing for the final MBBS examination.

### Materials and Methods

Medical students at the University of Colombo follow a

professorial clinical appointment in paediatrics in their fifth year of study. All 174 students of a given year of intake were requested to devise 2 multiple-choice questions each on a topic in paediatrics during this appointment, of 8 weeks' duration. The format of assessment used in this study was multiple-choice questions because it is the most objective component of the written examination.

The students were told that the questions they devised should be of a standard they considered they should have reached by the final MBBS examination, and should also differentiate between those who had and did not have sufficient core knowledge of paediatrics. Those with exceptional, i.e., “distinction level” knowledge in paediatrics should also be differentiated by these questions. They were instructed that the questions be of the true/false type, with 5 responses each, and marked with a negative scoring

<sup>1</sup> Department of Paediatrics, Faculty of Medicine  
University of Colombo, Sri Lanka

Author for Reprints: Prof Manouri Senanayake, Department of Paediatrics, Faculty of Medicine, Kynsey Road, Colombo 8, Sri Lanka.  
Email: suniljs@eureka.lk

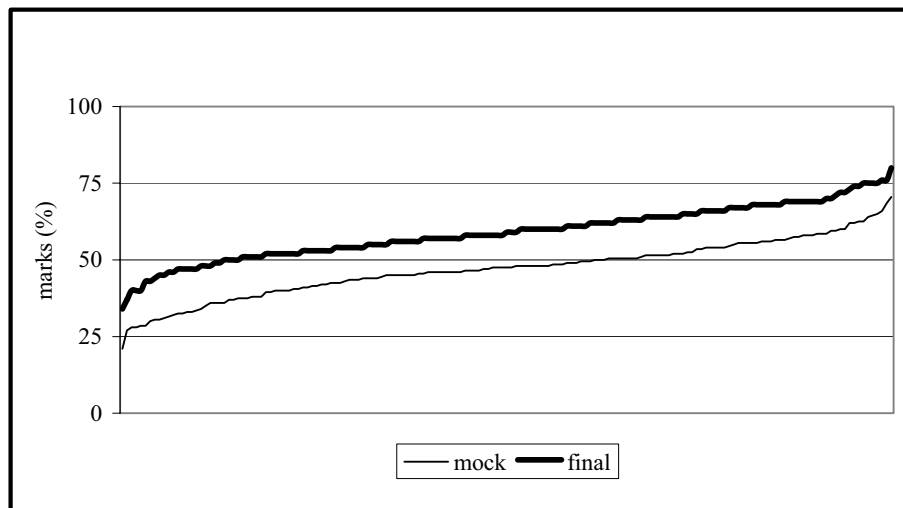


Fig. 1. Distribution of marks at “mock” and final examinations.

model. The topics chosen should be relevant to the assessment of an undergraduate sitting the final MBBS examination. Core curricular topics as well as topics not necessarily discussed during their professorial appointment were permitted, as was referencing a source of information when preparing the questions. Devising multiple-choice questions received no credit, was not a part of the continuous assessment and was done entirely on a voluntary basis. The questions were collected at the end of the appointment.

Questions received were arranged according to the different subtopics in paediatrics. Those considered ambiguous or wrongly worded for comprehension by the reader were excluded, and the remainder were compiled in a multiple-choice question bank. No question was excluded on the basis of being “too easy” or “too difficult”.

At the end of the academic year, a multiple-choice question paper was derived by randomly selecting 40 questions from this student multiple-choice question bank.<sup>2</sup> The style of this “mock” question paper was identical to that of the final MBBS paper. The students were invited to sit the “mock” multiple-choice question paper under examination conditions identical to those of the final MBBS, with regard to examination hall arrangements, invigilation, etc. Computer marking answer sheets were used. The “mock” examination was held a fortnight prior to the final paediatric examination multiple-choice question paper and attempting this examination was entirely voluntary. The students were unaware that the “mock” examination questions had been devised by their peers until after the examination.

The marks obtained by students who sat both the “mock” and final examinations were statistically compared using z scores. The difficulty indices for each question were calculated in both papers.

## Results

The “mock” student multiple-choice question bank comprised 229 multiple-choice questions.

Student generated questions covered different topics such as cardiology, neurology, nephrology, haematology, pulmonology, gastroenterology, rheumatology, infections, genetics, neonatology, endocrinology, nutrition, development, growth, paediatric surgery, skeletal disorders, child abuse, immunisation and other miscellaneous topics. The number of students who sat the “mock” and final examinations was 167 and 176, respectively.

A moderate and significant correlation ( $r = 0.67$ ) and ( $P < 0.01$ ) was found between marks obtained at the 2 multiple-choice question papers (Fig. 1).

The mean mark obtained at the “mock” examination was 47.1% [standard deviation (SD)  $\pm 9.2$ ] and the mean mark obtained at the final examination was 58.9% (SD  $\pm 8.7$ ). This difference was statistically significant ( $P < 0.0001$ ). At the “mock” examination, 102 (61%) students scored less than 50% (the minimum pass mark) and only 1 student scored over 70% (the distinction mark). In the multiple-choice question paper of the final examination, only 22 (13%) scored less than 50%. Fifteen scored over 70%.

The questions were arranged in order according to the marks obtained and the top 25% (H) and bottom 25% (L) counted for each item and difficulty index calculated using the formula

$$\frac{H + L}{N} \%, \text{ N being the total number of students.}^3$$

According to the difficulty index, the percentage of correct responses in different subject areas of paediatric

Table 1. Student Performance in Different Subject Areas

Subject area	Percentage of correct responses	
	"Mock" exam	Final exam
Neonatology	69.4	84.5
Neurology	62.0	79.8
Cardiology	75.5	74.7
Gastroenterology	63.5	74.7
Haematology	62.3	74.2
Endocrinology	77.4	67.3
Growth and development	67.5	65.6
Nutrition	47.6	64.5
Nephrology	69.4	62.0
Pulmonology	47.6	57.2
Practical procedures	Not tested	60.6

(Table 1) showed that questions in neonatology, neurology, gastroenterology, haematology, nutrition and respiratory disorders were more difficult in the "mock" examination.

### Discussion

In this study, we aimed to determine the standards medical students set for themselves and their peers when preparing for the final paediatric examination. We compared this with university standards.

Multiple-choice questions were chosen as the format of assessment for this study because they test a wide range of knowledge in a short time.<sup>4</sup> Students in this study were very familiar with negatively marked multiple-choice questions of the style set in these 2 papers. The multiple-choice question paper of the final paediatric examination in Faculty of Medicine, Colombo is devised by several senior academic staff very experienced and trained in creating multiple-choice questions. Students in this study did not undergo training in the art of setting multiple-choice questions. They relied on their own experience in answering such questions. We found a strong correlation in marks obtained at the 2 examinations set by students and staff.

The students' ability to set questions was comparable with that of the academic staff, and the spectrum of subject

topics covered was comprehensive. The significant difference in marks at the 2 examinations showed that the standards set by the students when preparing for the final MBBS examination are significantly higher than what is expected by their examiners. This may explain the increasingly high pass rate in paediatrics seen at the final MBBS examination in Colombo: 90.3% in 2002, 94.8% in 2003 and 97.2% in 2004. The students score above the standard at which the examiners set questions. We do not suggest that examiners raise the standard of the multiple choice examination, but recommend soliciting views from medical students prior to setting questions and standards.

A limitation of this study is that it assesses one particular written form of examination only; i.e., negatively marked true/false type multiple-choice questions. The study results might be different with other components of the examination.

### Acknowledgement

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