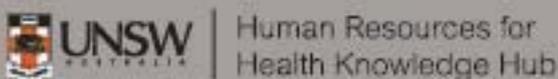


MEDICAL EDUCATION: A REVIEW OF INTERNATIONAL TRENDS AND CURRENT APPROACHES IN PACIFIC ISLAND COUNTRIES

Background paper for the HRH Hub series
on 'Evidence and Policy Options' for
healthcare education and training in
Pacific Island countries

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CONTENTS

- 2 Acronyms
- 3 Summary
- 4 Introduction
- 5 International trends
- 13 Current Pacific context
- 17 Policy implications for the Pacific
- 18 Conclusions
- 19 References
- 21 Appendix 1. Further reading
- 23 Appendix 2. Definitions

LIST OF TABLES

- 4 Table 1. The four stages of medical education
- 6 Table 2. From Flexner to Harden
- 14 Table 3. Country of origin of all students enrolled in the MBBS program (all years) at FNU from 2008-2012

LIST OF FIGURES

- 8 Figure 1. General models of medical education

ACRONYMS

AMC	Australian Medical Council	PAASCU	Philippine Accrediting Association of Schools, Colleges and Universities
BMedSci	Bachelor of Medical Science	PBL	problem based learning
CME	continuing medical education	PIC	Pacific Island country
CPD	continuing professional development	PRCC	Parallel Rural Community Curriculum
DOPS	direct observation of procedural skills	PSA	Prescribing Skills Assessment
ELAM	Escuela Latino-Americano de Medicina (Latin American Medical School)	QAA	Quality Assurance Agency
FSMed	Fiji School of Medicine	PRCC	Parallel Rural Community Curriculum
FNU	Fiji National University	ROMPE	Rural Origin Medical Program Entrants
GAMSAT	Graduate Medical Schools Admission Test	SJT	Situational Judgement Test
GEM	Graduate Entry Medicine	SLE	supervised learning event
GEP	Graduate Entry Program	SMHS	School of Medicine and Health Sciences
GMC	General Medical Council	QAA	Quality Assurance Agency
GMP	Graduate Medical Programs	UKCAT	United Kingdom Clinical Aptitude Test
MAPAS	Maori and Pacific Islanders Admissions Scheme	UMAP	Universities Medical Assessment Partnership
MBBS	Bachelor of Medicine, Bachelor of Surgery	UMAT	Undergraduate Medical and Health Sciences Admissions Test
MCQ	multiple choice question	UPSM	Umanand Prasad School of Medicine
MMI	multiple mini interview	UPNG	University of Papua New Guinea
MSC-AA	Medical Schools Council Assessment Alliance	USLME	United States Medical Licensing Examination
MSF	multi-source feedback	WFME	World Federation of Medical Education
NCD	non-communicable disease		
NCEA	National Certificates of Educational Achievement		
NTRCS	Northern Territory Rural Clinical School		
OSCE	objective structured clinical examination		
OSLER	objective structured long examination record or case		
OUM	Oceania School of Medicine		

A note about the use of acronyms in this publication

Acronyms are used in both the singular and the plural, e.g. NGO (singular) and NGOs (plural).

Acronyms are also used throughout the references and citations to shorten some organisations with long names.

SUMMARY

This review describes international trends and approaches to the planning and delivery of undergraduate and postgraduate medical education, including the assessment of trainees' performance. It draws upon examples from countries whose cultural and geographical background may be of relevance and interest to the future development and strengthening of medical education in the Pacific Island countries (PICs).

Common international trends identified from the review include:

- a) the development of 'graduate entry' medical education where entry to medical school requires a prior undergraduate degree;
- b) a move toward contextually relevant work-based education and assessment;
- c) extended placements focused on specific topics such as rural health;
- d) a requirement for multiple assessment domains and assessors to produce reliable evaluations;
- e) establishing of common assessment items and licensing examinations across countries and institutions; and
- f) the professionalisation and formalising of medical education as a discipline, including the need for training of clinical teachers and supervisors.

The two medical schools that have traditionally provided training for doctors in the Pacific region – the Fiji School of Medicine (FSMed) at Fiji National University (FNU) and the School of Medicine and Health Sciences (SMHS) at the University of Papua New Guinea (UPNG) – reflect many of the international trends identified by the review. However, these two schools are yet to embrace 'graduate entry' programs, while common approaches to selection, assessment, accreditation and subsequent eligibility for licensure reflect historic arrangements and remain relatively informal.

The international trends are more strongly reflected in the current status of medical education in Australia and New Zealand. These two countries continue to accept small numbers of medical undergraduates from PICs, and provide major inputs and support for postgraduate training.

Over the last six years, medical education in the Pacific has become more complex through the emergence of additional training options outside the two traditional institutions.

The current programs in the Pacific schools may reflect the historical influence of leaders and faculty members trained in the Australian, New Zealand or British systems, but have yet to evaluate the relevance of, or fully embrace, contemporary shifts in medical education.

Over the last six years, medical education in the Pacific has become more complex through the emergence of additional training options outside the two traditional institutions.

First, private medical schools have been established in Fiji, the Umanand Prasad School of Medicine (UPSM) and in Samoa, the Oceania University of Medicine, with systems and resources that are less well-established than those of the traditional schools and with much smaller student numbers.

Second, candidates from the Pacific have started to access scholarships to study medicine in places as diverse as Cuba, Georgia and elsewhere.

Pacific institutions and licensing authorities are yet to address the challenges associated with regulating and assimilating professionals from increasingly diverse training locations and health systems into their health workforces.

INTRODUCTION

The international review of medical education considers two main questions in relation to the Pacific context:

1. What undergraduate and postgraduate medical education and training models are predominant internationally and effective in training doctors for a variety of roles and contexts?
2. What are the key challenges in the Pacific region and what systems and structures need to be in place to ensure the delivery of appropriate

undergraduate and postgraduate medical education and training?

Stages of Medical Education

Medical education continues throughout the entire career of a doctor. Very broadly, there are four stages around which this review is structured, consistent with the stages and transitions in medical education around the world described by Wijnen-Meijer et al (2013) [1].

TABLE 1. THE FOUR STAGES OF MEDICAL EDUCATION

Stage	Other names*	Brief Description	Years (approx.)
<i>Undergraduate</i>	Medical student, Basic education	The university-based 'medical degree'	4-7
<i>Postgraduate 'Supervised'</i>	Junior Doctor Intern	Early career doctors, retain generalist roles	1-2
<i>Postgraduate Specialty</i>	Resident, Registrar	Training for a particular specialty/ career e.g. a 'surgeon' or a 'psychiatrist'	4+
<i>Continuing</i>	Continuing professional development (CPD) Continuing medical education (CME)	Maintaining, updating, diversifying, sub-specialising, relicensing and revalidating	Ongoing

The third stage (postgraduate specialisation) encompasses the skills needed to deliver high quality services, in both secondary care specialities and primary care settings. Documented participation in continuing professional development (CPD) activities is increasingly becoming a legislated requirement

for continuing licensure and registration in some jurisdictions. In the Pacific, associate fellowships of Australian and New Zealand specialist colleges also provides a method of recording and validating CPD activities.

INTERNATIONAL TRENDS

Undergraduate medical education

This section describes the key features that distinguish undergraduate medical education from the education and training of other health professionals. Many of the key features are also of relevance to the later stages of medical education.

Curriculum models - an overview

Worldwide, two main curriculum models for undergraduate medical education exist, although within these overarching models there are a range of educational options. The two models are:

1. 'Traditional' undergraduate program, lasting 5-7 years, primarily for school leavers.
2. Graduate Entry programs (GEP), lasting 4-5 years for graduates with a prior university degree or qualified health professionals. Students on these programs are referred to as undergraduates despite having a prior degree (as the qualification is at Bachelor, not Master, level).

Successful completion of either of these medical programs leads graduates to professional registration and postgraduate training. Many 'traditional' programs also include opportunities for additional full-time study leading to an intercalated degree, such as a BSc, Masters or PhD.

Recently – most notably in Australia, North America and Europe – new models of tertiary (higher) education have been introduced for professional degrees that are based on broad-based undergraduate degrees leading to employment, a professional graduate degree or a research degree such as a PhD. The most widely known in Australasia is the 'Melbourne model', which was introduced in 2008 (see Box 1 below).

The rationale behind the radical shift was in response to international changes, such as the Bologna Agreement¹, which aims to streamline and align all higher education programs and levels in the EU.

Entry requirements and selection criteria

Selection is 'the first assessment' of medical students and is probably the most important assessment a school carries out. Selection for medical school is usually through a combination of academic achievement at secondary school or university; the 'open space' in the application; referees' report and interview.

Most medical schools require students to have studied sciences to school-leaver level. Many also require applicants to pass an entry exam such as the Undergraduate Medical and Health Sciences Admissions Test, (UMAT) or the Graduate Medical

BOX 1. THE 'MELBOURNE MODEL'

Case example – The Melbourne model²

As the university moved to the Melbourne model, the six year Bachelor of Medicine, Bachelor of Surgery (MBBS) / Bachelor of Medical Science (BMedSci) degree and four-and-a-half-year Graduate Entry Program degree (MBBS) were phased out and replaced with a new four-year postgraduate (graduate entry) degree, the Doctor of Medicine (MD) which began in 2011.

Entrants require background knowledge in anatomy, physiology and biochemistry acquired through undergraduate study. There are approximately 330 places for the MD (250 for Australian and New Zealand citizens) and 80 for international (full fee) students.

¹ European Commission, Education and Training, the Bologna Process. Available from http://ec.europa.eu/education/higher-education/bologna_en.htm [cited March 2013]

² Faculty of Medicine, Dentistry and Health Sciences, Melbourne Medical School [internet]. 2011 [2012 10 Oct; cited 2012 Oct]. Available from: <http://medicine.unimelb.edu.au/study-here/md>

Schools Admission Test (GAMSAT). A 2009 overview of selection tools used in global settings confirms the complexity [2].

Multiple mini interviews (MMIs) are becoming increasingly common in medical selection and interviewing [3, 4]. Here, applicants move round ‘stations’ or tables and answer questions, perform tasks or discuss issues relating to various topics, including ethical issues, career choices, motivation for studying medicine, previous work experience, motor skills tasks and activities designed to explore attitudes. The responses are scored against criteria, often by two interviewers.

Special arrangements exist in many countries to facilitate the preferential selection of students from indigenous and rural backgrounds, usually to try and address deficits in the numbers of practitioners in these population groups or areas. Most medical programs also include a quota (typically 7-10%) for international students, some of whom will be supported through scholarships while others will be full fee-paying students.

Curriculum design and structure

The two predominant curriculum models in medical education are that of four-year graduate entry programs and five to seven year ‘traditional’ programs for school leavers or those without a degree or professional qualification. Within these basic structures a range of curriculum designs exist.

Historically, medical degrees have comprised a two-three year ‘pre-clinical’ course which focused on

the biological and natural sciences and was taught in a university setting, followed by a three-four year ‘clinical’ apprenticeship style course, largely located in hospitals and covering the major medical specialties.

In the last twenty years there have been increasing pressures on medical educators for curriculum reform, driven by concerns over ‘factual overload’ and the temporal and geographical separation of theory and practise.

Situational models of learning (where learning happens in the context of practice) have become more influential [5]; these include problem-based or case-based learning as well as increasingly structured workplace based clinical placements. This shift has occurred alongside movement towards more integrated curriculum models [6], in which biomedical sciences are learned alongside clinical medicine.

The consequences of these shifts led to curricula being reviewed and reformed so that students gained early clinical experience and ‘scientific’ learning extended into the clinical years. Medical educators described the shift from the traditional, preclinical-clinical model described by Flexner in 1911 to curricula that were based round the SPICES model [7] (see Table 2 below).

Measures were put in place to try to reduce the emphasis on learning facts. Outcome-based education [9] was suggested as a way of defining and structuring medical curricula, and, although debate in medical education over objectives, outcomes and competencies still exists, there is now general consensus that curricula should be defined in terms

TABLE 2. FROM FLEXNER TO HARDEN

<i>Flexner (1911)</i>	<i>Harden (1984): the SPICES model</i>
Teacher-centred	Student-centred
Knowledge giving	Problem-based
Discipline led	Integrated
Hospital oriented	Community oriented
Standard program	Electives (+ core)
Opportunistic (apprenticeship)	Systematic

Source: [8]

of what students and graduates should be able to achieve at various stages of the program [10, 11].

An example of this is the UK's General Medical Council (GMC) which lists outcomes for graduating medical students in its document *Tomorrow's Doctors 2009* [12]. These are revised every 3-4 years.

These educational shifts led to an increase in small group teaching and learning methods, particularly for topics such as communication skills, medical ethics and case discussions. One of the major introductions was problem based learning (PBL) [13].

'PBL represents an approach to learning where students discuss specially prepared cases constructed from problems or presenting conditions. Students work in small groups to generate hypotheses, derive learning goals and research and report back on the derived goals. The group process is important. Tutors are trained as facilitators and guardians of group process rather than content experts. Content expertise is provided through case writing and delivery of supporting lectures and practicals. PBL has been grounded in the literature of cognitive psychology particularly through its emphasis on learning in context, activation of prior learning and elaboration of learning [Schmidt, 1983]' [14, pp.295].

Research into whether a 'PBL curriculum' is more effective than a 'traditional curriculum' has demonstrated some advantages, although this may have largely reflected the shift from large scale lectures to a more intense facilitated small group teaching [15, 16].

It is now acknowledged that reliance on one mode of learning is not best educational practice and most schools operate a 'hybrid' model of curriculum design that utilises a range of teaching, learning and assessment methods. More recently, case-based learning is being introduced where students learn the basic sciences and clinical skills through clinical cases often involving real or simulated patients.

Although the traditional approach has often been criticised for separating the underpinning 'science' from clinical medicine and which many people feel is best learned in a clinical context, it is often easier to develop and deliver a traditional course within the structure and organisation of established medical schools.

It is now acknowledged that reliance on one mode of learning is not best educational practice and most schools operate a 'hybrid' model of curriculum design that utilises a range of teaching, learning and assessment methods.

Many medical schools are divided into clinical and non-clinical departments and on a practical level, integration can often be difficult to achieve. Many new schools have been able to take advantage of a lack of 'history' and establish curriculum management and internal funding arrangements more consistent with the needs of delivering a modern, integrated medical curriculum.

Postgraduate education and training

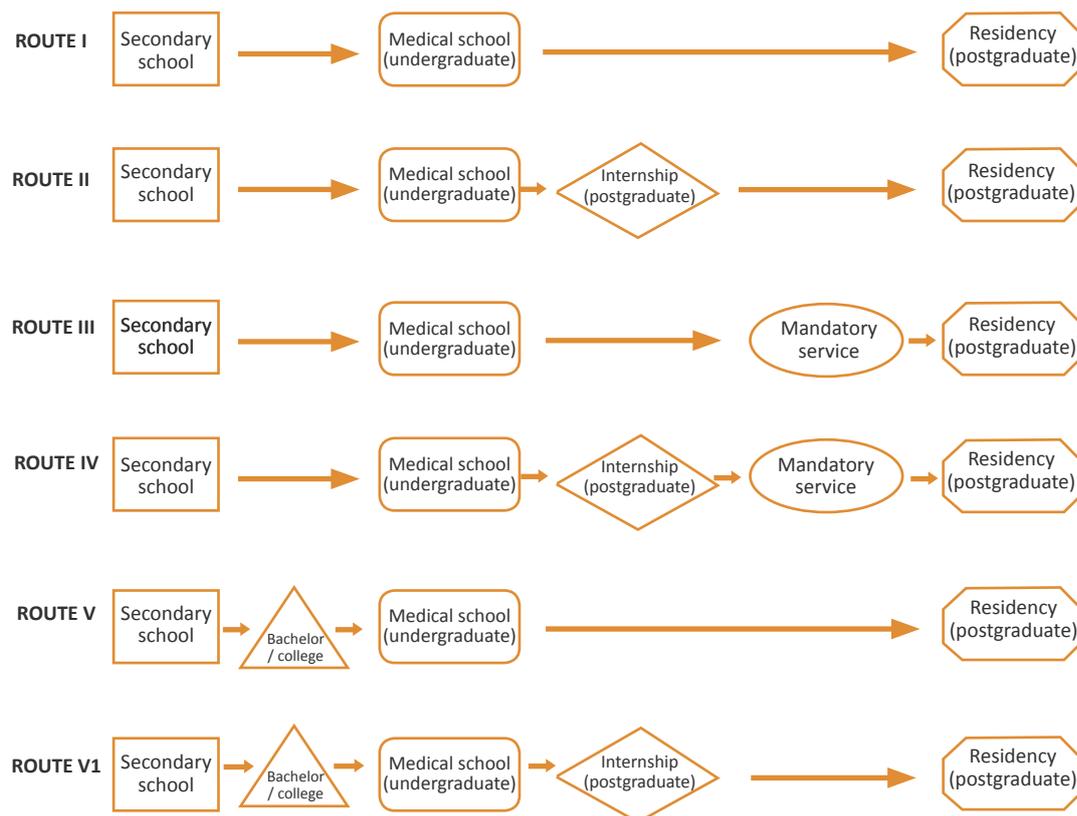
A 2013 paper has categorised models of current medical training around the world and provided an explanation of frequently used terminology of medical education.

While there are many differences between countries as to the structure and length of medical education, most require new medical graduates to undertake a period of supervised practice (typically one or two years) under a provisional or limited scope registration whilst the final stages of training take place. This period of internship is typically structured around clinical placements in a small range of core clinical specialties: medicine, surgery and primary care.

Because doctors also need skills in assessing and managing patients with acute, undifferentiated presentation, many internship programs also include an emergency medicine rotation. Other rotations are highly variable between programs and jurisdictions, and may include paediatrics, reproductive health, mental health and community placements).

To progress from the internship stage normally requires the completion of formal assessments, often with a strong emphasis on workplace-based assessment (see page 11).

FIGURE 1. GENERAL MODELS OF MEDICAL EDUCATION



Route I. Argentina, Brazil, China, DR Congo, France, Georgia, Germany, India, Italy, Mexico, Netherlands, Russia, Saudi Arabia, Spain, Ukraine, Uruguay

Route II. Australia (1), Bangladesh, Denmark, Israel, Japan, Pakistan, Sweden, United Kingdom

Route III. Columbia, Dominican Republic, Ethiopia, Iran, Nicaragua, Peru, Turkey**

Route IV. Egypt, Nigeria, South Africa, South Sudan, Sudan, Indonesia**

Route V. Canada, USA

Route VI. Australia (2), Philippines, United Kingdom

* Internship is also called: foundation program, medical officer, house officer training period, or housemanship.

** In Turkey and Indonesia, mandatory (social) service can take place after residency as well.

Source: Wijnen-Meijer et al (2013) [1]

Specialty training

Specialty training marks the point in a doctor's education where they choose to become a specific 'type' of doctor, such as surgeon, psychiatrist or 'general practitioner' (family doctor). Each specialty generally has its own set of national educational standards and assessments, administered by a professional body that is distinct from the overall medical regulator (and may also be distinct from providers of undergraduate medical education, e.g. professional Boards or Medical Colleges). Specialty training posts are often strictly controlled at national level, tied to workforce planning and the future needs of the healthcare system.

In Australia, the future structure of postgraduate training and allocation of postgraduate trainees is currently under review, following a move to increase the number of domestic medical graduates by more than 50% between 2009 and 2014.

Continuing professional development

Most countries require doctors to maintain a commitment to education throughout their career, in order to keep up-to-date with advances and changes in practise. The common model is through participation in small, accredited training/educational courses that are assigned 'points' or 'credits'. The number of credits is broadly correlated with the time taken to complete the activity.

In the US, CPD is more commonly referred to as continuing medical education (CME). Evidence that an individual has undertaken CPD is often used by licensing bodies to determine whether a doctor's license to practise should be renewed, usually on an annual basis but occasionally on an accrual basis over a longer cycle (e.g. 2-5 years).

Rural and remote medical education

A recent development in undergraduate medical education, of particular relevance to PICs, is the development of educational programs specifically targeted at rural and remote healthcare. These include the establishment of dedicated rural clinical schools throughout Australia, together with the Rural Incentives Program, which aimed to improve the recruitment and retention of general practitioners for rural communities [17].

Whilst the majority of medical programs require students to undertake a mandatory clinical placement in primary care, some medical schools also offer a dedicated part of their curriculum, optional in some cases, focused on rural and remote health.

A well evaluated example is the Parallel Rural Community Curriculum (PRCC) which was established at Flinders University (Adelaide) in 1997 as a stream for 3rd year students within the 4-year graduate entry program [17]. Students spend the whole year located in one of four rural centres. Video conference links provide communication and teaching media. The 3rd year of the MBBS program at Fiji School of Medicine includes a community block.

Assessment

This definition, from the UK QAA subject benchmark statement on medicine [18, pp.9], summarises the approach to assessment in medical education.

'Assessment strategies and methods must ensure that the knowledge, understanding, skills and attitudes set out previously are sufficiently covered. Methods must be both valid and reliable. Appropriate procedures for standard setting should be employed. Clinical competence must be rigorously assessed so as to identify those who are not yet fit for practice. Methods of achieving these aims may vary but should always include frequent direct observations of students interviewing and examining patients. Assessment of some qualities will require extended observations to be made. While professional attitudes, for example, may be difficult to assess directly, the consequences of attitudes on behaviour must be assessed - usually by observation of that behaviour over a period of time. Assessment needs to be thorough but should not be so onerous or so frequent as to interfere with the learning process.'

Assessment programs should be blueprinted (matched to learning outcomes) and developed for their 'educational impact'. Standards, pass marks and decisions about borderline performance are determined via 'standard setting' processes which use the opinions of expert educators and/or the performance of exceptional students as their reference points. Different approaches to standard setting methods are available in the literature [19, 20].

Norcini et al (2011) [21] outlined criteria for good assessment that include:

- validity or coherence
- reproducibility or consistency
- equivalence
- feasibility
- educational effect
- catalytic effect
- acceptability.

These criteria do not apply equally well to all situations and contexts. Consequently, the purpose of the test (summative versus formative) and the perspectives of stakeholders (examinees, patients, teachers-educational institutions, healthcare system, and regulators) influence the importance of the criteria.

For high stakes examinations (i.e. those that have a major bearing on the final qualification or registration status), the Australian Medical Council (AMC) suggests selecting highly reliable methods such as multiple choice questions (MCQs) and objective structured clinical examinations (OSCEs) alongside instruments which 'measure domains such as independent learning, communication with patients, working as part of a health care team, development of professional qualities and problem solving skills where reliability is less well established' [22, pp19]. Some of the most commonly used assessment methods are described below [23].

Written, knowledge based assessments

Written assessment methods are usually about testing knowledge and understanding. They include essays as well as methods that can be marked quickly and easily, often using optical mark readers, to facilitate efficiency with large cohorts. Examples include:

- **'True or false' questions.** Concise and quick but hard to construct and may encourage guessing.
- **Multiple Choice Questions (MCQs).** Including 'single, best option' MCQs and 'multiple true or false' questions. These are some of the most commonly used 'knowledge based' assessments for factual knowledge at all levels of medical education.

- **'Short answer' open ended questions (SAQs),** also called 'modified essay questions' (MEQs). Most helpful for assessing aspects of competence that cannot be tested in other ways.
- **'Key feature' questions** where a description of a realistic case is followed by a small number of questions that require only essential decisions (questions may be MCQs or open ended questions). Useful for measuring problem solving ability, application of knowledge, and clinical judgement within defined settings or circumstances.
- **'Extended matching questions' (EMQs)** which include a list of options, a lead in question and some case descriptions or vignettes. Also useful for testing problem solving ability and application of knowledge.
- **Progress testing** the theory of undergraduate progress testing is that the whole medical school student body (first year students through to final year students) sit the same test together at regular intervals [24]. The questions in each progress test are drawn randomly from an extensive bank of questions. The development of knowledge of each year group and each individual can then be mapped over a period of time [25].

Assessment of clinical competence

Clinical competence includes communication skills as well as competence in history taking, examination skills or carrying out practical procedures.

'The AMC considers it important that clinical examinations, whether on real or simulated patients, form a significant component of the overall process of assessment of the clinical disciplines. They provide an incentive to students to learn relevant knowledge and skills. Clinical examinations should also include an assessment of student ability to recognise abnormal clinical findings (and their distinction from normal) and the ability to provide an appropriate interpretation of these findings.'

The AMC also encourages medical schools to utilise the direct observation of student performance using in-training or other forms of clinical assessment' [22, pp.19].

BOX 2. NATIONAL ASSESSMENT BANKS

Case example – National assessment banks, the UK MSC-AA scheme³

Many medical schools have developed large question banks for knowledge based assessment questions that can be randomly collated into question papers by computer. Even in countries which do not have national licensing examinations like those in the US, there are increasing examples of shared question banks which many schools have collaborated on developing e.g. the UK-based Medical Schools Council Assessment Alliance (MSC-AA), formerly Universities Medical Assessment Partnership (UMAP).

The MSC-AA is a partnership to improve undergraduate assessment practice through collaboration between all 31 undergraduate medical schools in the UK. The MSC-AA will enable more individuals to be involved in item-writing and quality assurance, resulting in improved individual and institutional skills and knowledge regarding the development of high quality assessments in medicine.

Partner schools will be given access to a question bank of high-quality items with good validity and reliability in a variety of formats. The questions have been developed in collaboration and undergone extensive quality assurance and standard setting. All UK medical schools have agreed to include a proportion of finals examination questions from the shared question bank, which enable psychometrically valid comparisons.

Skill based or practical assessments

Traditionally, assessment of clinical competence was assessed through 'long case' assessments and the viva voce (oral) examination. These assessments have been critiqued for their lack of reliability and validity and for their case specificity.

Over the last thirty years, a more structured approach to assessment of clinical competence has led to the development of assessments that sample performance widely over a range of patient problems. This is deemed to be particularly important for high stakes examinations, and these assessments are now used at all levels of medical education. Examples include the OSCE, and other forms of structured clinical examinations such as the OSLER (objective structured long examination record or case) and the PACES (practical assessment of clinical examination skills) assessments.

The OSCE is one of the most commonly used practical assessments in medical education at undergraduate and postgraduate levels. In an OSCE, learners travel through a series of stations where they are asked to perform a specific task. At each station there is a task with instructions for the learner and some material (e.g. a mannequin, a simulated or real patient, a

laboratory test result) and an examiner. The learner spends a fixed amount of time at each station (usually five or ten minutes) before moving onto the next station.

Workplace based assessment [26]⁴

In line with the focus on aligning learning more closely with clinical and professional activities, there has been an increasing trend (particularly in early postgraduate training) towards workplace based assessment: i.e. assessment **of** practice, in practice, **by** practitioners, peers and patients. This also reflects moves towards more direct engagement in formal assessments of doctors by peers, other health professionals and patients and a move towards encouraging, facilitating and formalising ongoing reflection on practice.

Methods used for providing feedback and gathering evidence from the workplace in current use tend to be variations on one of four themes; observations of

³ Medical Schools Council. Medical Schools Council Assessment Alliance [internet]. 2001 [Cited 2012 Oct]. Available from: <http://www.medschools.ac.uk/MSA-AA>

⁴ Source for this section reproduced with permission.

clinical activities, discussion of clinical cases, analysis of performance data and multi-source feedback.

Observations of clinical activities

Traditionally, clinical skills have been assessed by the 'long case' presentation. The problem of case specificity using this technique, limiting the potential to sample widely, has given rise to the mini-clinical evaluation exercise or mini-CEX [27].

This tool has been developed to assess the clinical skills that trainees most often use in real patient encounters. It is based on assessment of multiple complete or partial clinical encounters observed by an educational supervisor or other clinician.

Discussion of clinical cases

Case-based discussion is one of the evidence gathering tools used in workplace-based assessment in the UK Foundation (newly qualified, internship) program and is also being used in specialty training programs such as in medicine, paediatrics and general practice.

Analysis of performance data

Norcini [2003] describes the basis for making a judgement on clinical performance data as having three potential sources: outcomes, process and volume. *Outcomes* of care, while being the most desirable measure, are limited by problems of attribution (to the individual), complexity, case mix and numbers. This is a particular problem in the assessment of trainee performance. The *process* of care is more directly attributable to the individual doctor but effective processes do not necessarily mirror the best patient outcomes.

The use of *volumes* of activity is premised on the basis that the more of a given activity that a doctor performs, the better their quality of care is likely to be. This basis for judgement is typified by the internship log books and those of the procedural specialties, e.g. surgery, obstetrics and gynaecology [28].

Multi-source feedback

The aim of using multi-source feedback (MSF) to assess doctors in the workplace is to view a person's work from a variety of perspectives. In medical

settings, physician colleagues (peers), co-workers and patients can be asked to complete surveys about the doctor.

The person being assessed receives feedback based on their own aggregate ratings, usually along with average ratings of others being assessed at the same time. There is also a clear opportunity for comparing self-assessment data with those provided by raters [29].

Portfolios

A portfolio comprises a dossier of evidence collected over time, which demonstrates a doctor's education and practice achievements [30]. The majority of portfolios used in medical education are web-based; they are now also becoming common for logging CPD activities.

There are many portfolio models [31] but in essence, if well-constructed, a portfolio should chronicle the journey of a learner towards the attainment and maintenance of professional expertise.

Teachers

The AMC requires that all teaching staff have relevant educational expertise in addition to their clinical and/or academic background. This reflects the world-wide professionalisation of teachers in higher education as well as the need to ensure that teachers of medical students understand the particular educational context of medical education, which is now a professional subject discipline supported by associations and peer reviewed journals.

CURRENT PACIFIC CONTEXT

Undergraduate medical education

Pacific institutions

Fiji School of Medicine and University of Papua New Guinea

In the Pacific, the two established medical schools in the public sector are Fiji School of Medicine (FSMed; established in 1885 and now part of the College of Medicine, Nursing and Health Sciences at Fiji National University) and the School of Medicine and Health Sciences at the University of Papua New Guinea (UPNG; established in 1964).

Although a majority of students entering both schools come from the host country, both also serve the wider Pacific region and also accept small numbers of students from further afield. Domestic health workforce pressures in Fiji, where the doctor-to population ratio of 4.3 per 10,000 is among the lowest in the Pacific [32, 33, 34], have seen a numerical increase in FSMed intakes – consisting mainly of candidates from Fiji – and a slight reduction in the proportion of students from other PICs.

FSMed and UPNG have long standing cross-accreditation agreements that enable graduates of either medical school to enter an internship program in either country or elsewhere in the Pacific. Graduates of Australian and New Zealand medical schools are also accredited to apply for provisional or full registration in the Pacific. Nevertheless, common approaches to assessment, accreditation and subsequent eligibility for licensure and registration reflect historic arrangements and remain relatively informal.

Private medical schools

More recently, two new medical schools have been established in the Pacific: the Umanand Prasad School of Medicine (UPSM) in Lautoka, Fiji (which operates as a fully private institution) and the Oceania University of Medicine (OUM) in Apia, Samoa (which operates under a collaborative funding model involving government and the private sector). Reciprocal accreditation agreements do not currently exist with FSMed or UPNG.

The OUM curriculum has been given provisional accreditation by PAASCU (the Philippine Accrediting Association of Schools, Colleges and Universities)⁵

but the status of an independent assessment of the UPSM curriculum against the World Federation of Medical Education (WFME)⁶ standards is uncertain.

Of the 176 students who have enrolled in UPSM since 2008, 169 are from Fiji and 7 from the Solomon Islands (including 5 in the 2012 intake). The first cohort of students is expected to graduate at the end of 2013; the Fiji Medical Council has not yet finalised the provisional registration status of these students for the purposes of internship and entry into the medical workforce.

OUM mainly admits students from Samoa or outside the Pacific. It offers two related undergraduate programs: a face-to-face and on-line distance education program for Samoan based students; and an online learning program for students from other countries (primarily the US and Australia). Students in other countries undertake clinical training primarily in their own country and are supervised on their clinical placements by a faculty of clinicians coordinated within each country.

Since 2006, 34 candidates have graduated from OUM: 16 from Australia, 12 from the United States, 5 from Samoa and one from New Zealand. The title of the degree conferred may be aligned with the one that is usually awarded to graduates in the candidate's own country, e.g. those from PICs, Australia or New Zealand may be awarded the MB BS degree, while those from the United States may be awarded a MD.

Samoan graduates are able to enter their country's national internship program, while other candidates generally enter a medical workforce outside the Pacific by completing jurisdiction-specific internship requirements and/or licensure examinations, e.g. the United States Medical Licensing Examination (USMLE) for US students.

Institutions outside the Pacific

Historically, small numbers of students from the Pacific have studied at medical schools in Australia New Zealand or, rarely, the United States; this has

⁵ <http://paascu.org.ph/home2012/> [cited March 2013]

⁶ <http://www.wfme.org/> [cited March 2013]

TABLE 3. COUNTRY OF ORIGIN OF ALL STUDENTS ENROLLED IN THE MBBS PROGRAM (ALL YEARS) AT FNU FROM 2008-2012

Country	2008	2009	2010	2011	2012
<i>Pacific Island countries</i>					
Fiji	253	264	272	282	282
Cook Islands	7	5	3	2	2
Kiribati	13	11	11	9	11
Marshall Islands	0	0	0	1	3
Micronesia	4	4	4	5	5
Nauru	1	1	4	3	3
Niue	1	1	1	2	1
Palau	1	0	0	0	0
Samoa	28	31	25	23	14
Solomon Islands	35	32	31	35	36
Tokelau	1	1	1	0	1
Tonga	21	18	18	32	31
Tuvalu	8	6	4	5	3
Vanuatu	11	10	19	13	10
Total all PICs	384	384	393	412	402
Total non-Fijian	131	120	121	130	120
% non-Fijian PIC	34.1	31.3	30.8	31.6	29.9
<i>Other countries</i>					
India	0	0	0	1	1
New Zealand	0	0	0	1	0
Timor Leste	3	3	1	0	0
United Kingdom	0	0	1	1	1
Total FNU enrolments	387	387	395	415	404
% from PICs	99.2	99.2	99.5	99.3	99.5
% from other countries	0.8	0.8	0.5	0.7	0.5

generally been dependent on individual scholarships or private funding (e.g. family resources). For the purposes of subsequent registration and licensure, degrees from all of these institutions carried mutual accreditation with Pacific institutions and jurisdictions.

Since 2007, there has been a proliferation of scholarship opportunities for students from the Pacific to study outside the region. The largest program is through the *Escuela Latino-Americano de Medicina* (ELAM; Latin American Medical School), where more than 200 medical students from 8 different PICs are currently enrolled. The first 18 graduates are expected to return to the Pacific (to Kiribati) in the second half of 2013.

Scholarships to ELAM are offered under bilateral agreements between PIC governments and Cuba; these agreements generally also fund the placement of varying numbers of Cuban medical practitioners in-country while the students are away studying in Cuba.

Smaller numbers of undergraduate candidates have been granted scholarships to study in other countries, such as Georgia and Morocco. These are generally negotiated outside the health sector without reference to workforce plans (where they exist) and by the public sector employer which organises the advertisement and collection of applications, while selection for study is made in the host country. A wide range of international donors support postgraduate placements and training overseas, in India, Asia and the Pacific rim countries.

Moreover, none of the curricula from the non-Pacific institutions have been objectively compared with or accredited against those offered through FSMed or UPNG, nor have they been assessed as providing relevant knowledge and skills to practice in PIC health systems and settings.

There has been a slight easing in rates of scholarship acceptance while PIC Ministries of Health consider the possible implications for their health workforce and recurrent health budgets, and on the potential for overlapping their scope of services with other cadres, in particular nurses and nurse practitioners.

Postgraduate medical education

Formal, structured postgraduate training is limited in the Pacific. FSMed and UPNG offer postgraduate diplomas and Masters of Medicine in various

specialties, and enrolment is open to candidates who obtained their primary undergraduate degree at either institution (or in Australia or New Zealand) and who have completed an accredited internship and selection process (see below); i.e. (and subject to availability of places), enrolment is available to candidates from any PIC as well as the host countries. OUM and UPSM do not currently offer formal postgraduate education.

Pacific candidates who hold an undergraduate medical degree from FSMed or UPNG are often able to complete part of their postgraduate training via supervised 6-12 month placements in Australia or New Zealand, under a specific category of associate registration in each country.

Pacific graduates from Australian or New Zealand medical schools are able to access postgraduate training via the Australasian professional colleges in the same way as domestic graduates (see previous sections on postgraduate education and training, and specialty training).

Entry requirements and selection criteria

The minimum entry requirement for the MBBS program at FSMed is a mark of 250/400 in Fiji's final secondary school examinations. FSMed also accepts students who have been selected by PICs to be given scholarships for full time studies at FSMed and UPNG and who have met the minimum criteria.

Selection of candidates to send to FSMed or UPNG is done by respective national scholarship units, and mostly by academic achievements and interviews. These scholarship holders make up about 90% of the FSMed intake each year with only 10% of places available for privately funded students. Students from Pacific Island countries including Fiji are given preference to applicants from outside the region.

Curriculum design

Both FSMed and UPNG have PBL elements in their undergraduate programs. The curriculum of UPSM is based on a 'pre-clinical:clinical' model, with a lecture-based rather than case or PBL-based curriculum in the early years and relatively limited clinical exposure due to poor integration with Western Divisional Health Service and the Divisional Hospital in Lautoka.

FSMed has a traditional entry undergraduate program lasting 6 years. There is no formal graduate entry program although recognition of prior learning is considered on a case by case basis. At FSMed the first 3 years are PBL with mostly classroom-based PBL activities with some exposure to clinical settings for Clinical Skills Sessions.

The curriculum in the first 3 years is integrated. This is followed by 2 years of predominantly (80%) clinical exposure with one community rotation. This is a mixture of didactic learning and practical skills learning and is effectively a clinical apprenticeship. At the end of the 5th year the final exit written exam is held. The 6th and trainee internship year is logbook driven with a mixture of assessment methods; a skills based/practical assessment, clinical assessment and workplace assessment.

In relation to the general models of medical education described in Figure 1 (page 8), there is no single agreed model in the Pacific, although PICs with an internship program generally track on Route IV. Those without an internship program have sent their students to countries with programs or have tracked on Route III.

Some countries are developing their own internship programs to accommodate the scale-up in graduates from overseas programs, e.g. Kiribati is currently developing their own to commence in 2014.

OUM has a PBL-based curriculum in which PBL cases are discussed online, supplemented by face-to-face or video conference lectures and tutorials depending on where students are based.

Students in the US undertake clinical training after two years when they have passed USMLE part 1. In Samoa, students are involved in supervised clinical training in both hospital and the community from the first year, although this is relatively limited in the early years.

Matching supply and demand

In the recent past, the increasing recruitment of overseas trained doctors into the region made it apparent that FSMed and UPNG were not able to meet the region's demand for doctors. Concurrently the increasing numbers of scholarship funded students reduced the opportunity for privately funded places in their programs.

These demands have been the impetus behind the acceptance by many PICs of scholarships for places in overseas medical schools, all of which have been agreed without coherent workforce planning or recurrent budget forecasting and for the emergence of private medical schools.

It can be anticipated that when the 200 Pacific Islander graduates of overseas training programs return to their countries commencing in 2014 and UPSM graduates its first cohort, also in 2014, that gaps will be filled; but the effects may be that governments will have difficulty employing them all and will need to review their scholarship programs.

Sensing this possibility, some PICs have begun to scale back their overseas scholarship acceptances, while others including Fiji, continue to allocate national scholarships for medical training in Fiji and foreign scholarships for medical training overseas.

POLICY IMPLICATIONS FOR THE PACIFIC

Based on the international evidence and regional trends, Pacific Island countries (PICs) would benefit from:

1. Aligning scholarship and educational commissioning systems with workforce planning and fiscal potential, so as not to impact adversely on health budgets.
2. Greater alignment of undergraduate medical education and postgraduate training with workforce planning, both within and between PICs.
3. Different curriculum models (such as graduate entry) to enable career progression into medicine for health professionals from other disciplines, or for new roles.
4. Defining common training standards, outcomes and competencies across the Pacific region (the 'Pacific doctor') at each stage of training to ensure Pacific doctors are 'fit for practise' and 'fit for purpose' given epidemiological transitions to non-communicable diseases (NCDs) and the reinvigoration of primary health care.
5. Ensuring curricula, teaching and learning methods and assessments enable achievement of the defined outcomes at key stages of medical education and training, and that learners gain sufficient experience of relevant specialities or topics (e.g. NCDs, tuberculosis, malaria) and health contexts (e.g. primary / remote area health care).
6. Review of program accreditation, regulatory and licensing mechanisms to reflect international best practice, ensure minimum professional standards and to facilitate mobility across the region to practice in areas of need.
7. A common, agreed scheme of postgraduate training which includes structured internships and speciality training programs.
8. Regulatory and licensing systems clearly defining scopes of practice relative to other cadres of health professionals and to facilitate the assimilation of overseas trained doctors into the workforce.
9. Designing training programs to equip practitioners to work in these defined scopes of practice.
10. Establish medical education training programs for academics, clinical teachers, and postgraduate supervisors, mentors and managers to facilitate learning and ensure a high quality education and training system.

CONCLUSIONS

The international review and analysis of the current Pacific context suggests a number of areas with potential relevance to PICs and to Pacific regional organisations:

1. Undergraduate medical education and postgraduate training needs to be aligned more closely to workforce planning, both within and between PICs. Different curriculum models (such as graduate entry) may help enable career progression into medicine for health professionals from other disciplines or the establishment of new roles to work alongside doctors and nurses (e.g. physician's assistants).
2. Scholarship and educational commissioning systems must also be linked with workforce planning and defining needs for graduates in various localities and specialities, this must also be coherent with health strategic plans and fiscal potential, so as not to impact adversely on health budgets.
3. Defining common standards, outcomes and competencies across the Pacific region (the 'Pacific doctor') at each stage of training would help ensure Pacific doctors are 'fit for practise' and 'fit for purpose' given epidemiological transitions to non-communicable diseases (NCDs) and the reinvigoration of primary health care.
4. Curricula, teaching and learning methods and assessments should be designed to enable achievement of the defined outcomes at key stages of medical education and training and should enable learners to gain sufficient, in-depth experience of relevant specialities and health contexts (e.g. primary health care).
5. Program accreditation, regulatory and licensing mechanisms should reflect international best practice to facilitate mobility across the region whilst ensuring minimum professional standards and encouraging doctors to practice in areas of need.
6. A common, agreed scheme of postgraduate training which includes structured internships and speciality training programs will help smooth out existing differences in undergraduate training and facilitate the assimilation of overseas trained doctors into the workforce.
7. The regulatory and licensing system should clearly define scopes of practice relative to other cadres of health professionals and training programs should be designed to equip practitioners to work in these defined scopes.
8. As additional graduates enter the workforce, support and training programs should be in place to enable academics, clinical teachers, postgraduate supervisors and managers to facilitate learning and ensure a high quality education and training system.

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APPENDICES

APPENDIX 1. FURTHER READING

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APPENDIX 2. DEFINITIONS

These definitions relate to **the context of this report** and are derived from the multiple definitions used by different healthcare systems in different countries.

Accreditation is a process designed to confirm the educational quality of new, developing and established education and training programs. It is usually carried out by peer/third party review against established standards, outcomes or performance indicators.

Advanced practitioners are health professionals (often nurses, but can be from a range of professions or subject disciplines) who have been trained in and granted registration in an extended or discrete scope of practice. Countries use various names for such practitioners (whose roles may vary according to locality and service need) including: **nurse consultants/practitioners, medical, physician, surgical or anaesthetic assistants/associates and clinical officers.**

Approval for programs is sought via accreditation. Decisions to approve (or not) an educational program are often taken by a different body to the one which has carried out the accreditation process.

Assessment refers to a determination of student/learner performance/competence, often via examinations.

Bonded/Bonding: An arrangement where trainees/students agree to return to a particular geographical location and/or specialty after completing their education in return for financial assistance with the cost of their education or other benefits.

Credentialing is the process of reviewing and confirming the qualifications and profile of a healthcare professional, for example when they apply for positions in different institutions or countries. It is particularly important in countries with regional registration systems.

Commissioning is used to describe the scheme and processes by which education and training programs (and in particular the numbers of students/trainees involved in those programs) are funded and allocated to education and healthcare training organisations. Commissioning activities include the allocation of scholarships and subsidies and self-funding schemes

and typically involve some type of formal quality assurance of the education and training provided.

Continuous Professional Development (CPD) is the process by which fully qualified professionals demonstrate that they are maintaining and updating their education and clinical competence. It usually involves completion of a specified number of accredited activities over a fixed recurring time period (e.g. 1-5 years).

Competency: A broad composite statement, derived from professional practice, which describes a framework of skills, knowledge, attitudes, psychosocial and psychomotor elements.

Curriculum: The totality of the education program, that is coherent in structure, processes and outcome and that links theory and practice in the professional education of a doctor, nurse or of a midwife.

Family Medicine Practitioners are medical practitioners who work primarily in the community/primary care/family medicine and provide care to individual patients and families. In some countries these are known as **GPs (General Practitioners)**. This is seen as a specialty in its own right, requires specific training and is different from the role of a general physician/generalist.

Hub and Spoke refers to a scheme in which one organisation acts as a management or coordinating centre for a number of other related organisations or activities. One example is a primary care (family medicine) training centre which has responsibility for coordinating and monitoring the training activities of a number of other practices.

Licensing generally involves conferring upon an individual a license to practice their particular healthcare profession. Many countries do not distinguish between licensing and registration (page 23) and both may be partial/temporary/conditional in certain circumstances (for instance, newly qualified professionals in some countries).

Local: Applicable to individual Pacific Island countries (PICs).

Numerus Clausus (closed number) is a system of regulating student numbers (usually medical students) wherein a fixed number of places are

available each year, usually determined by the government and based upon future workforce planning. The opposite form of student number regulation is a **free market**, wherein there is no regulation of student numbers - graduates compete for jobs and Universities compete for students (and funding, from students and/or government).

Postgraduate refers, in the context of the education of healthcare professionals, to education which occurs after initial registration with/licensing by a professional body. This is sometimes termed **post-qualifying** education for example when referring to some nursing programs which are at diploma and not degree level.

Regional: Applicable to all PICs across the Pacific region.

Registration generally refers to the actual process of enrolling with a professional regulatory body following graduation from an accredited program. Many countries do not distinguish between registration and licensing, but some do and a license to practise may be issued by a separate authority, particularly in countries where the processes are managed at a regional level. Both licensing and registration may be partial/temporary/conditional under certain circumstances (for instance, newly qualified professionals in some countries).

Revalidation refers to the renewal of a license to practice. Many countries have some sort of regular renewal or re-registration, generally every few years (although the term revalidation is one most commonly associated with the UK currently).

Standard: A definition or statement for evaluating performance and results established by evidence and approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the requisite degree of compliance in a given context.

Specialty/Specialist refers to the latter stages of postgraduate training, generally for doctors, where they attain their final career status (e.g. surgeon, psychiatrist).

Undergraduate refers, in the context of the education of healthcare professionals, to education that occurs before, and usually leads to, registration with/

licensing from a professional body/regulator. This is sometimes termed **prequalifying** or **basic** education. Students engaged in undergraduate education of this sort may already have a previous degree (and so are graduates, but will always be referred to here as undergraduate not postgraduate students).

THE KNOWLEDGE HUBS FOR HEALTH INITIATIVE

The Human Resources for Health Knowledge Hub is one of four hubs established by AusAID in 2008 as part of the Australian Government's commitment to meeting the Millennium Development Goals and improving health in the Asia and Pacific regions.

All four Hubs share the common goal of expanding the expertise and knowledge base in order to help inform and guide health policy.

Human Resource for Health Knowledge Hub

University of New South Wales

Some of the key thematic areas for this Hub include governance, leadership and management; maternal, newborn and child health workforce; public health emergencies; and migration.

www.hrhhub.unsw.edu.au

Health Information Systems Knowledge Hub

University of Queensland

Aims to facilitate the development and integration of health information systems in the broader health system strengthening agenda as well as increase local capacity to ensure that cost-effective, timely, reliable and relevant information is available, and used, to better inform health development policies.

www.uq.edu.au/hishub

Health Finance and Health Policy Knowledge Hub

The Nossal Institute for Global Health (University of Melbourne)

Aims to support regional, national and international partners to develop effective evidence-informed national policy-making, particularly in the field of health finance and health systems. Key thematic areas for this Hub include comparative analysis of health finance interventions and health system outcomes; the role of non-state providers of health care; and health policy development in the Pacific.

www.ni.unimelb.edu.au

Compass: Women's and Children's Health Knowledge Hub

Compass is a partnership between the Centre for International Child Health, University of Melbourne, Menzies School of Health Research and Burnet Institute's Centre for International Health.

Aims to enhance the quality and effectiveness of WCH interventions and focuses on supporting the Millennium Development Goals 4 and 5 – improved maternal and child health and universal access to reproductive health. Key thematic areas for this Hub include regional strategies for child survival; strengthening health systems for maternal and newborn health; adolescent reproductive health; and nutrition.

www.wchknowledgehub.com.au

Human Resources for Health Knowledge Hub

Send us your email and be the first to receive copies of future publications. We also welcome your questions and feedback.



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