

Regulation

C3: Should regulation (licensure and registration) be used to ensure the quality and relevance of health professional practice versus no regulation?

Continuous professional development-Health workers

C5. Should continuous professional development and in-service training of health professionals implemented be implemented which reflects reforms in education to address evolving population health needs, increase the coverage of services, and actively engage education and training institutions in its design and execution versus no such training and development of health professionals?

Governance and planning

Good practice 1

Government at the highest level shows political commitment to reform and takes leadership of its implementation.

Good practice 2

There is formal collaboration and shared accountability between the ministry of health, the ministry of education, and other related ministries (e.g. finance, labour, public service), at national and/or sub-national level in the education and training of health professionals.

Good practice 3

A national plan to produce and retain graduates is developed in consultation with stakeholders, informed by the needs and absorptive capacity of the labour market, and aligned with the national health plan.

Good practice 4

The creation or strengthening of national or sub-national institutions, capacities or mechanisms to support the implementation of the reform and scale-up plan (e.g. legislation, policies, procedures).

Annex 4. Decision tables

Faculty development

PICO B3: Should health professional schools implement faculty development programmes, which update and develop teaching and clinical skills, in both undergraduate and postgraduate programmes versus no faculty development programmes?

Problem: Misalignment of faculty with service delivery needs.

Option: Implement faculty development programmes in health professional schools, which update and develop teaching and clinical skills, in both undergraduate and postgraduate programmes.

Comparison: No faculty development programmes, which update and develop teaching and clinical skills.

Setting: Global with focus on low- and middle-income countries.

CRITERIA		JUDGEMENT						EVIDENCE				QUERIES TO PANEL
PROBLEM	Is the problem serious?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Effective teaching may influence trainee performance. This impact may not only educational outcomes (e.g. student learning) but also on practice outcomes (e.g. a change in trainee practice) or health outcomes (e.g. an effect on patient or population health).				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	Are a large number of people affected?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Most faculty and their students are affected, as well as people who seek health care.				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Desirable effects are increased quantity, quality and relevance of health professionals. <i>Quantity</i> <i>Quality</i> <i>Relevance</i> <i>Unintended effects</i> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>				No evidence for the undesirable effects
	Are the anticipated undesirable effects small?	No	Probably no	Uncertain	Probably yes	Yes	Varies					
	What is the certainty of the anticipated effects?	Very low	Low	Moderate	High	No evidence	Varies	Quality <i>Embedding faculty development in accreditation processes.</i> If faculty development for teachers (and evidence of addressing teachers' needs through a variety of programmes) was embedded in on going institutional accreditation then it would be difficult for deans and educational managers to ignore the need for teachers to participate in faculty development and quality assurance of their training programmes (McLean et al. 2008; Hatem et al. 2011). At an individual level, requiring teachers to demonstrate achievement of evidence-based teaching competencies to maintain teaching accreditation would convince faculty of the importance of faculty development (Hatem et al. 2011). Establishing a team of faculty members whose primary responsibility is to teach. Just as research staff are currently employed in positions primarily to undertake research, teaching staff should be funded, responsible and rewarded for good teaching (Hatem et al. 2011). At the same time teaching should not be the sole preserve of these faculty members; administrators, educators, researchers and clinicians should all be expected to share in the teaching role, just as teachers should contribute to these other roles.				
	Are the anticipated desirable effects large relative to the undesirable effects?	No	Probably no	Uncertain	Probably yes	Yes	Varies					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					Depends on the programme

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL												
RESOURCE USE	Are the resources required small?	No <input type="checkbox"/> Probably no <input checked="" type="checkbox"/> Uncertain <input type="checkbox"/> Probably yes <input type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	Main resource requirements <table border="1"> <thead> <tr> <th>Resource</th> <th>Costs</th> </tr> </thead> <tbody> <tr> <td>Dedicated staff and faculty</td> <td></td> </tr> <tr> <td>Faculty time</td> <td></td> </tr> <tr> <td>Development programmes</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Resource	Costs	Dedicated staff and faculty		Faculty time		Development programmes						
	Resource	Costs														
Dedicated staff and faculty																
Faculty time																
Development programmes																
	Is the incremental cost small relative to the benefits?	No <input type="checkbox"/> Probably no <input type="checkbox"/> Uncertain <input type="checkbox"/> Probably yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	Benefits gained from the policy are likely to outweigh the costs													
EQUITY	What would be the impact on health equity?	Reduced <input type="checkbox"/> Probably reduced <input type="checkbox"/> Uncertain <input checked="" type="checkbox"/> Probably increased <input type="checkbox"/> Increased <input type="checkbox"/> Varies <input type="checkbox"/>														
ACCEPTABILITY	Is the option acceptable to most stakeholders?	No <input type="checkbox"/> Probably no <input type="checkbox"/> Uncertain <input type="checkbox"/> Probably yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	Based on stakeholders survey, on a 1–9 scale: Mean (sd) = 7.8 (1.5) See values and preferences survey for qualitative comments													
FEASIBILITY	Is the option feasible to implement?	No <input type="checkbox"/> Probably no <input type="checkbox"/> Uncertain <input type="checkbox"/> Probably yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	Based on stakeholders survey, on a 1–9 scale: Mean (sd) = 6.7 (1.9) See values and preferences survey for qualitative comments													

PICO B3 b RECOMMENDATION: Should health professional schools implement faculty development programmes, which update and develop teaching and clinical skills, in both undergraduate and postgraduate programmes?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings <input type="checkbox"/>	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings <input type="checkbox"/>	The balance between desirable and undesirable consequences <i>is uncertain</i> <input type="checkbox"/>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings <input checked="" type="checkbox"/>	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings <input type="checkbox"/>
Recommendation	<i>We recommend against the option</i> <input type="checkbox"/>	<i>We recommend the option only in the context of rigorous research</i> <i>Suggest not considering the option</i> <input type="checkbox"/>	<i>We recommend the option in the context of close monitoring and evaluation</i> <i>Suggest considering the option</i> <input checked="" type="checkbox"/>	<i>We recommend the option</i> <input type="checkbox"/>	
<input checked="" type="checkbox"/> Health professional schools should implement faculty development programmes, which update and develop teaching and clinical skills in both undergraduate and postgraduate programmes					
Justification	To address the misalignment of faculty with service delivery needs				
Implementation considerations	Considerations when designing a faculty development programme (Steinert 2009)				
	<ul style="list-style-type: none"> - Understand the institutional / organizational culture - Determine appropriate goals and priorities - Conduct needs assessments to ensure relevant programming - Develop different programmes to accommodate diverse needs - Incorporate principles of adult learning and instructional design - Offer a diversity of educational methods - Promote 'buy-in' and market effectively - Work to overcome commonly encountered challenges - Prepare staff developers - Evaluate and demonstrate effectiveness - Provide and offer peer programme consultation to enhance faculty development initiatives 				
Key uncertainties	<ul style="list-style-type: none"> - Effect of faculty development programmes on the outcome of interest - Cost effectiveness 				
Monitoring and evaluation	<ul style="list-style-type: none"> - Accreditation process includes assessment of faculty development - Retention - Improvement of service delivery 				
Research priorities	<ul style="list-style-type: none"> - High quality research is needed to determine, inter alia, whether health professional education programmes make a difference to students' learning and throughput rates, whether developing teaching skills in students influences their abilities as future teachers - There is a pressing need to understand the effect of faculty development initiatives on patient outcomes and the health of populations 				

PICO B3: Should continuous development programmes for faculty and teaching staff, which update and develop teaching skills be mandatory (e.g. curriculum development and instructional design) in both undergraduate and postgraduate programmes, versus no mandatory CPD programmes, and linked to funding, promotion and reward?

Problem: Absence of higher education policies for mandatory faculty development in health professional education.

Option: Mandatory continuous development programmes for faculty and teaching staff, which update and develop teaching skills (e.g. curriculum development and instructional design), in both undergraduate and postgraduate programmes and linked to funding, promotion and reward.

Comparison: No mandatory policy on continuous development programmes for faculty and teaching staff.

Setting: Global, with focus on low- and middle-income countries.

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL																										
PROBLEM	Is the problem serious?	<table border="0"> <tr> <td>No</td><td>Probably</td><td>Uncertain</td><td>Probably</td><td>Yes</td><td>Varies</td> </tr> <tr> <td></td><td>no</td><td></td><td>yes</td><td></td><td></td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>	No	Probably	Uncertain	Probably	Yes	Varies		no		yes			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Determining the impact of effective teaching is a challenge as many other factors may influence trainee performance. This impact may be measured as educational outcomes (e.g. student learning), practice outcomes (e.g. a change in trainee practice) or health outcomes (e.g. an effect on patient or population health; Ramani 2006). Cassel (2004) argues for a clear link between the quality of medical education and the quality of clinical practice, which should be the goal of that education.									
	No	Probably	Uncertain	Probably	Yes	Varies																								
	no		yes																											
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No	Probably	Uncertain	Probably	Yes	Varies																									
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BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	<table border="0"> <tr> <td>No</td><td>Probably</td><td>Uncertain</td><td>Probably</td><td>Yes</td><td>Varies</td> </tr> <tr> <td></td><td>no</td><td></td><td>yes</td><td></td><td></td> </tr> <tr> <td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>	No	Probably	Uncertain	Probably	Yes	Varies		no		yes			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<table border="0"> <tr> <td>Quantity</td><td>Quality</td><td>Relevance</td><td>Unintended effects</td> </tr> <tr> <td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </table>	Quantity	Quality	Relevance	Unintended effects	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Desirable effects are increased: quantity, quality and relevance of health professionals
	No	Probably	Uncertain	Probably	Yes	Varies																								
		no		yes																										
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No	Probably	Uncertain	Probably	Yes	Varies																									
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	no		yes																											
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	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL												
RESOURCE USE	Are the resources required small?	<i>No</i> <input type="checkbox"/> <i>Probably no</i> <input checked="" type="checkbox"/> <i>Uncertain</i> <input type="checkbox"/> <i>Probably yes</i> <input type="checkbox"/> <i>Yes</i> <input type="checkbox"/> <i>Varies</i> <input type="checkbox"/>	Main resource requirements <table border="1"> <thead> <tr> <th>Resource</th> <th>Costs</th> </tr> </thead> <tbody> <tr> <td>Financial</td> <td></td> </tr> <tr> <td>Human Resources</td> <td></td> </tr> <tr> <td>Infrastructure</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Resource	Costs	Financial		Human Resources		Infrastructure						Resources to implement the policy
	Resource	Costs														
Financial																
Human Resources																
Infrastructure																
	Is the incremental cost small relative to the benefits?	<i>No</i> <input type="checkbox"/> <i>Probably no</i> <input type="checkbox"/> <i>Uncertain</i> <input type="checkbox"/> <i>Probably yes</i> <input checked="" type="checkbox"/> <i>Yes</i> <input type="checkbox"/> <i>Varies</i> <input type="checkbox"/>														
EQUITY	What would be the impact on health equity?	<i>Reduced</i> <input type="checkbox"/> <i>Probably reduced</i> <input type="checkbox"/> <i>Uncertain</i> <input checked="" type="checkbox"/> <i>Probably increased</i> <input type="checkbox"/> <i>Increased</i> <input type="checkbox"/> <i>Varies</i> <input type="checkbox"/>														
ACCEPTABILITY	Is the option acceptable to most stakeholders?	<i>No</i> <input type="checkbox"/> <i>Probably no</i> <input type="checkbox"/> <i>Uncertain</i> <input type="checkbox"/> <i>Probably yes</i> <input checked="" type="checkbox"/> <i>Yes</i> <input type="checkbox"/> <i>Varies</i> <input type="checkbox"/>		Might not be acceptable to the current faculty (requires change)												
FEASIBILITY	Is the option feasible to implement?	<i>No</i> <input type="checkbox"/> <i>Probably no</i> <input type="checkbox"/> <i>Uncertain</i> <input type="checkbox"/> <i>Probably yes</i> <input checked="" type="checkbox"/> <i>Yes</i> <input type="checkbox"/> <i>Varies</i> <input type="checkbox"/>														

PICO B3 RECOMMENDATION: Should continuous development programmes for faculty and teaching staff, which update and develop teaching skills be mandatory (e.g. curriculum development and instructional design) in both undergraduate and postgraduate programmes, versus no mandatory CPD programmes, and linked to funding, promotion and reward?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings	The balance between desirable and undesirable consequences <i>is uncertain</i>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Recommendation	<i>We recommend against the option</i>	<i>We recommend the option only in the context of rigorous research</i>	<i>We recommend the option in the context of close monitoring and evaluation</i>	<i>We recommend the option</i>	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/> Governments, funders and accrediting bodies should implement higher education policies for mandatory faculty development programmes that are aligned with the goal of relevant health professional education (in developing teaching and clinical skills) and linked to funding, promotion and reward					
Justification	To address the misalignment of faculty with service delivery needs				
Implementation considerations	<ul style="list-style-type: none"> - determine appropriate goals and priorities - conduct needs assessments to ensure relevant programming - develop different programmes to accommodate diverse needs - incorporate principles of adult learning and instructional design - offer a diversity of educational methods - promote 'buy-in' and market effectively - evaluate – and demonstrate – effectiveness 				
Key uncertainties	The extent to which a policy can bring about change in faculty development				
Monitoring and evaluation	Changes in higher education policies				
Research priorities	<i>Addressing research gaps.</i> High quality research is needed to determine, inter alia, whether health professional education programmes do increase confidence in teaching, whether faculty development programmes to develop teaching skills make a difference to students' learning and throughput rates, whether developing teaching skills in students influences their abilities as future teachers, and the influence that teaching rewards have on faculty development. Further, as above, there is a pressing need to understand the effect of faculty development initiatives on patient outcomes and the health of populations.				

PICO B4: Should innovative expansion of faculty, through the recruitment of community-based clinicians and health workers as educators, be used versus no such expansion?

Problem: Inadequate numbers of health educators in health professional training institutions negatively affect the quantity, quality and relevance of their graduates.

Option: Innovative expansion of faculty, through the recruitment of community-based clinicians and health-care workers as educators.

Comparison: No innovative expansion of faculty.

Setting: Global, with focus on low- and middle-income countries.

CRITERIA		JUDGEMENT							EVIDENCE	QUERIES TO PANEL
PROBLEM	Is the problem serious?	No	Probably no	Uncertain	Probably yes	Yes	Varies	One of the biggest barriers to scaling up is the inadequate number of faculty/educators. The reasons are twofold: lower salaries compared to clinicians and restrictive academic requirements. Very often, health professionals wanting to go into education need to take a basic education course and are also required to have postgraduate qualifications in science education. Unless innovative approaches are taken, the shortage will remain absolute and restrict the scaling up of health professional training.	How universal is the requirement for Ph.Ds for faculty?	
	Are a large number of people affected?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	No	Probably no	Uncertain	Probably yes	Yes	Varies	<p>Desirable effect The desirable effect would be to increase the number of available educators and thus to be able to train more health professionals.</p> <p>Undesirable effects The possible undesirable effect would be a "lowering" of standards in terms of training. This is based on the premise that researchers and scientists make better educators, which is not based on any evidence, although may depend to some degree on the topic is basic science (e.g. biochemistry) as different from clinical topics. As long as there is a balance in a faculty, with maintenance of a cadre of scientist-researchers, this should minimise undesirable effects (Ferreira, personal communication).</p> <p>Although there are no systematic reviews, there is anecdotal evidence. Experience in Brazil suggests a dramatic effect is possible with massive recruiting through fellowships and ordinary PHC professionals to participate in a triangular teaching/learning process. This improves their quality, opens the minds of regular teachers towards community environment assistance and encourages students to become members of future 'Family Health' teams. This is seen as the only realistic option in areas where there is growth of students and/or undersupply of educators, because there is no reliable supply stream of educators, particularly for underserved areas. (Personal communication with Jose Roberto Ferreira, formerly a senior director of HR at PAHO for 30 years and currently Advisor to Fiocruz Foundation and to the Ministry of Health. He is in the process of assessing all the educational programmes in interaction with MOH; Ferreira et al. 2007; Haddad et al. 2008).</p>		
	Are the anticipated undesirable effects small?	No	Probably no	Uncertain	Probably yes	Yes	Varies			
	What is the certainty of the anticipated effects?	Very low	Low	Moderate	High	No evidence	Varies			
	Are the anticipated desirable effects large relative to the undesirable effects?	No	Probably no	Uncertain	Probably yes	Yes	Varies			

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL
RESOURCE USE	Are the resources required small?	No <input type="checkbox"/> Probably <input checked="" type="checkbox"/> Uncertain <input type="checkbox"/> Probably <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	Main resource requirements The main resources required are funding to pay for the increased numbers of educators and for their replacements in terms of some of their clinical duties, and the human resources i.e. sufficient numbers of clinicians who are interested and able to teach. There is also a need for incentives for teaching and development of teacher/preceptor training resources, which require funding.	
	Is the incremental cost small relative to the benefits?	No <input type="checkbox"/> Probably <input type="checkbox"/> Uncertain <input checked="" type="checkbox"/> Probably <input type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	The benefit this brings of increasing the numbers of health professionals that can be trained will rapidly outweigh the costs; although the increased numbers of health professionals will themselves bring about additional costs, this will be balanced by strengthening of the system with possibilities of enhancing recruitment and self-regeneration. The relative balance of these factors depends on training an appropriate mix of future health professionals.	
EQUITY	What would be the impact on health equity?	Reduced <input type="checkbox"/> Probably <input type="checkbox"/> reduced <input type="checkbox"/> Uncertain <input type="checkbox"/> Increased <input checked="" type="checkbox"/> Varies <input type="checkbox"/>	If there was appropriate selection of educators familiar with and grounded in primary care and a socially accountable approach, there could be a major impact on equity. This would occur through training health professionals with a generalist focus, skills in working in teams and distributed according to population health needs. This could be the case particularly in rural areas where there are difficulties in retaining health professionals unless they are educated and trained in rural settings.	
ACCEPTABILITY	Is the option acceptable to most stakeholders?	No <input type="checkbox"/> Probably <input type="checkbox"/> Uncertain <input checked="" type="checkbox"/> Probably <input type="checkbox"/> Yes <input type="checkbox"/> Varies <input type="checkbox"/>	There may be resistance from traditional health professional schools, with guarding of territory and suspicion from institutions where the hierarchy is based on scientific achievement and research. Desired cultural and attitudinal changes can be achieved by refocussing institutions on their core mission and responsibilities to the communities they serve.	
FEASIBILITY	Is the option feasible to implement?	No <input type="checkbox"/> Probably <input type="checkbox"/> Uncertain <input type="checkbox"/> Probably <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Varies <input type="checkbox"/>	Dual appointments of educators in schools and health facilities, and adjunct appointments of educators from health facilities, are two examples of successful innovations that are being applied in many settings to rapidly scale up faculty. There is good international evidence for this.	

PICO B4 RECOMMENDATION: Should innovative expansion of faculty, through the recruitment of community-based clinicians and health-care workers as educators be used versus no such expansion?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings <input type="checkbox"/>	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings <input checked="" type="checkbox"/>	The balance between desirable and undesirable consequences <i>is uncertain</i> <input type="checkbox"/>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings <input type="checkbox"/>	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings <input type="checkbox"/>
Recommendation	<i>We recommend against the option</i> <input type="checkbox"/>	<i>We recommend the option only in the context of rigorous research</i> <input type="checkbox"/>	<i>We recommend the option in the context of close monitoring and evaluation</i> <input checked="" type="checkbox"/>	<i>We recommend the option</i> <input type="checkbox"/>	
<input checked="" type="checkbox"/> Innovative expansion of faculty through the recruitment of community-based clinicians and health-care workers in the context of research and with close monitoring and evaluation					
Justification	-				
Implementation considerations	<ul style="list-style-type: none"> - These educators must come from and be based in the context in which health professionals are needed, in order to ensure socially accountable training - Up skilling and in-service education (faculty development) for these educators becomes a critical need as part of the implementation - There needs to be a support structure for this. Scaling up without better infrastructure or ensuring the right level of training (relevance) and supervision/mentoring may only bring temporary benefits 				
Key uncertainties	The impact on quality of graduates of changing the requirements of educators				
Monitoring and evaluation	<ul style="list-style-type: none"> - Numbers, locations and qualifications of educators - Numbers of health professionals produced and location/nature of their practice 				
Research priorities	<ul style="list-style-type: none"> - There is a need to assess the effectiveness of educators in terms of the skills that are most useful and valuable, and to explore the best ways to support them in developing these skills - There needs to be more case studies in countries who have tried to implement innovative education - There is also a need for longitudinal (prospective) studies for the future on the use of innovative education with a control group and with attention to confounding factors 				

Curriculum development

PICO B5/6: Should adapting curricula to evolving needs through the incorporation of core competencies and/or the transformative evaluation and development of the curriculum be implemented versus no adaptation of curricula to evolving needs?

Problem: Health professional curricula not linked to evolving educational and population health needs.

Option: To improve the quality of health professions education through credible, consistent and transformative competency-based curricula that is adapted to evolving needs.

Comparison: No core competency-based curricula and/or transformative evaluation and development of the curriculum.

Setting: Global, with focus on low- and middle-income countries.

CRITERIA		JUDGEMENT						EVIDENCE				QUERIES TO PANEL
PROBLEM	Is the problem serious?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Curriculum is a means by which health professionals can acquire appropriate knowledge and skills to respond to the needs of a given population. Most curricula for health professions are outdated and do not respond to the needs of the population (Frenk et al. 2010), compromising efforts towards achievement of key health targets such as the MDGs.				
	Are a large number of people affected?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Quantity	Quality	Relevance	Unintended effects	<p>A competency-based curriculum can help to define a specific training programme (Smith et al. 2009; Mullan et al. 2010).</p> <p>Measurable improvements in the knowledge, skills and attitudes of participants based on pre-and post-tests in a cancer care competency initiative were noted (Smith et al. 2009).</p> <p>Quantity could affect the effective delivery of the curricula. For example, there is need to balance the teacher student ratio. Allocation of learning and teaching hours may also have implications on quality.</p> <p>Effective curricula based on evidence entails:</p> <ul style="list-style-type: none"> - significant institutional groundwork taking into account underserved areas; - needs assessment to identify immediate and long-term educational and population needs; - clear articulation of rationales and objectives, greater use of interactive methods /problem based learning. <p>Competency-based curricula have the potential of bringing about positive educational effects such as: improvements in curricula that entail revision of teaching modalities; focus on prevailing health needs and trends; addresses individual student needs; generates a comprehensive approach to infrastructure development to include infrastructure and technology development; and improvements in the curricula can lead to better health service delivery.</p>
	Are the anticipated undesirable effects small?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	What is the certainty of the anticipated effects?	Very low	Low	Moderate	High	No evidence	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Are the anticipated desirable effects largely relative to the undesirable effects?	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL																		
RESOURCE USE	Are the resources required small?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Main resource requirements</p> <table border="0"> <tr> <td>Resources</td> <td>Costs</td> </tr> <tr> <td colspan="2">Based on the literature:</td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> Resources for needs assessment, curricula review and adaptation Funding of staff time Resources for improving infrastructure for classroom and clinical teaching (urban/rural) Resources for improving faculty skills and knowledge, based on new curricula Resources for improvements in teaching/learning aids, technology, etc. </td> </tr> </table>	Resources	Costs	Based on the literature:		<ul style="list-style-type: none"> Resources for needs assessment, curricula review and adaptation Funding of staff time Resources for improving infrastructure for classroom and clinical teaching (urban/rural) Resources for improving faculty skills and knowledge, based on new curricula Resources for improvements in teaching/learning aids, technology, etc. 		
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	Is the incremental cost small relative to the benefits?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There are uncertainties in the way the curricula can implemented as it depends on of the above resources, including the students themselves							
No	Probably no	Uncertain	Probably yes	Yes	Varies																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
EQUITY	What would be the impact on health equity?	<table border="0"> <tr> <td>Reduced</td> <td>Probably reduced</td> <td>Uncertain</td> <td>Probably increased</td> <td>Increased</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Reduced	Probably reduced	Uncertain	Probably increased	Increased	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A well-designed curriculum which is responsive to population health needs could contribute to improving the quality of services and to social accountability (Bartlett et al 2011; Mullan et al 2010; Abdelrahman and Alfadil, 2008; Muula 2005)							
Reduced	Probably reduced	Uncertain	Probably increased	Increased	Varies																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
ACCEPTABILITY	Is the option acceptable to most stakeholders?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Literature shows interest and willingness to change curricula to introduce core competencies (Edler et al. 2010; Mullan et al. 2010; Chan et al. 2010; Naylor et al. 2010; Smith et al. 2009; Abdelrahman, Alfadil 2008; Turner, Farquhar 2008; Smith, Lichtveld 2007).</p> <p>The mean score for acceptability was 6.92 SD was 2.019</p>							
No	Probably no	Uncertain	Probably yes	Yes	Varies																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
FEASIBILITY	Is the option feasible to implement?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Yes, especially when closely linked to the needs of the national health system (Zaman et al. 2008; Elias, Devadasan 2008).</p> <p>The mean score for feasibility was 5.86 SD was 2.013</p>							
No	Probably no	Uncertain	Probably yes	Yes	Varies																	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	

PICO B5/6 RECOMMENDATION: Should adapting curricula to evolving needs through the incorporation of core competencies and /or the transformative evaluation and development of the curriculum be implemented versus no adaptation of curricula to evolving needs?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings <input type="checkbox"/>	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings <input type="checkbox"/>	The balance between desirable and undesirable consequences <i>is uncertain</i> <input type="checkbox"/>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings <input checked="" type="checkbox"/>	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings <input type="checkbox"/>
Recommendation	<i>We recommend against the option</i> <input type="checkbox"/>	<i>We recommend the option only in the context of rigorous research</i> <input type="checkbox"/>	<i>We recommend the option in the context of close monitoring and evaluation</i> <input type="checkbox"/>	<i>We recommend the option</i> <input checked="" type="checkbox"/>	
	<input checked="" type="checkbox"/> If an educational institution has an ongoing curriculum, or would like to develop a competency-based curriculum, it is important to pay attention to: <ul style="list-style-type: none"> - involvement of key members of the profession and other stakeholders - taking stock of the national demographic health trends/health profile and population projections especially age 15–25 years - recruitment, education, age and entry qualifications - minimum period of study and level of academic award - staffing and structural (physical infrastructure, skills labs, and technology) requirements - leverage work of similar institutions (Drehobl et al. 2012). 				
Justification	Curricula review and adaptation provides a vehicle for a positive impact on quality and relevance of health professional education and consequently gaining support from educational institutions. It further provides an opportunity for faculty members to develop new perspectives, infrastructure development and stakeholder involvement in advocacy.				
Implementation considerations	<ul style="list-style-type: none"> - Resistance to curriculum change can occur. Significant changes may have implications on faculty who may be uncertain of new understandings and practices, and will need to take into account issues of timelines for the rollout and faculty development - Establishing or working with existing institutional structures including community placements for learning - Continuous evaluation 				
Key uncertainties	Cost implications; timing for curricula changes; effect on quantity unknown; curriculum as a means to social accountability uncertain				
Monitoring and evaluation	Curriculum development and implementation requires special skills. A curriculum is not static and has no beginning or end; there is no perfect curriculum (Scales 1985). Therefore monitoring and evaluation requires careful planning, coordination and input from experts and stakeholders. Monitoring and evaluation should be in-built into the initial planning, as it requires adequate time allocation and resources				
Research priorities	<ul style="list-style-type: none"> - Impact on quantity, quality, relevance of competency-based curricula - Links between the retention of health workers trained in rural settings and adapted competency-based curricula that take into account rural settings - Evidence of improved proficiency attributed to new curricula - Long-term evaluation of the impact of improved proficiency attributed to curricula by following former course participants, their residency programme directors and perhaps peers - Longitudinal studies linking the retention of health workers trained in community and rural settings can be linked back to changes in the curricula - Special case studies of universities such as Keele which have, from the outset aimed their curricula and training in rural GP practices 				

Simulation methods

PICO B8: Should simulation methods of varying methods of fidelity be used in the education of health professionals versus no simulation?

Problem: Low number, quality and relevance of health professionals.

Option: Simulation methods of varying levels of fidelity used in the education of health professionals.

Comparison: No simulation methods.

Setting: Global, with focus on low and middle-income countries.

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL																				
PROBLEM	Is the problem serious?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>It is important to help trainees acquire necessary skills while minimizing adverse effects on patients they are taking care of.</p> <p>This search was based on the original question of the "Effectiveness of infrastructure materials and related resources (including information and communication technologies) necessary for health professional education and training in producing quantity, quality and relevance".</p> <p>A number of studies have shown a clear relationship between the availability of resources for education, the deployment of these resources and the production of health professionals. Although the availability of educational resources, whether in resource-poor or resource-rich contexts, is a pre-condition for their deployment, it is not a pre-condition for efficient use. To this end, availability of infrastructure, materials and resources, and their efficient use in the education and production of health professionals are considered on two areas:</p> <ol style="list-style-type: none"> the infrastructure of interest researched were: classrooms; meeting rooms; libraries; clinical skills lab student housing; resources such as: audiovisual; technology; computers; e-learning; ICTs; Internet. <p>The systematic reviews for simulation were of high quality.</p>	<p>How do we define simulation:</p> <ul style="list-style-type: none"> - anatomical models - three dimensional video - expert patients - students practicing on students? <p>Could this include educational games?</p>								
	No	Probably no	Uncertain	Probably yes	Yes	Varies																		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
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No	Probably no	Uncertain	Probably yes	Yes	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<table border="0"> <tr> <td>Quantity</td> <td>Quality</td> <td>Relevance</td> <td>Unintended effects</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Quantity	Quality	Relevance	Unintended effects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Large in terms of safety. Literature from emersion medical (Tulenko). American academy of paediatrics newborn resuscitation. Use evidence showing increased number of times doing a procedures increases proficiency.</p>
	No	Probably no	Uncertain	Probably yes	Yes	Varies																		
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																		
	Quantity	Quality	Relevance	Unintended effects																				
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																					
Are the anticipated undesirable effects small?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>A number of good quality systematic reviews identified a wide range of studies including RCTs in various professions (medical, nursing, multidisciplinary) of various levels (students, practitioners)</p> <p>Quantity Not applicable</p>	<p>Allows the education of more students with fewer faculty.</p> <p>Important bridge between theory and practice.</p> <p>Opportunity costs. Risk of not performing the procedure on real patients (e.g. paid patients).</p>									
No	Probably no	Uncertain	Probably yes	Yes	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			
What is the certainty of the anticipated effects?	<table border="0"> <tr> <td>Very low</td> <td>Low</td> <td>Moderate</td> <td>High</td> <td>No evidence</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Very low	Low	Moderate	High	No evidence	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Quality</p> <ul style="list-style-type: none"> - Improved competence, performance - Improved knowledge - Improved trainee satisfaction - More practice yields better results - However, inconsistent results for sustainability - Results for patient outcomes inconsistent 	<p>Question about sustainability due to expensive, high-tech models that wear out and require replacement and maintenance. When possible, use low-cost methods for simulations (e.g. oranges for injections, animals – deliver babies of cows).</p>									
Very low	Low	Moderate	High	No evidence	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			
Are the anticipated desirable effects large relative to the undesirable effects?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Relevance No evidence identified</p>	<p>Anatomical models used for delivery are very relevant, intubation very relevant, intubation done on manicans.</p> <p>Provides proof of clinical competence (e.g. number of births attended, etc.). No undesirable effects, if well integrated into the curriculum. Could limit creative response to unexpected if not fidel to real life. Three dimensional video does not develop manual skills. Not a substitute, but a proxy.</p>									
No	Probably no	Uncertain	Probably yes	Yes	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL																				
RESOURCE USE	Are the resources required small?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Main resource requirements</i></p> <table border="1"> <thead> <tr> <th>Resource</th> <th>Costs</th> </tr> </thead> <tbody> <tr> <td>Simulation cost U.S.</td> <td>\$5000 – \$200 000</td> </tr> <tr> <td>Staff to operate simulation programmes</td> <td></td> </tr> <tr> <td>Example: cost of training a surgical resident in the operating room for four years</td> <td>nearly \$50 000</td> </tr> </tbody> </table>	Resource	Costs	Simulation cost U.S.	\$5000 – \$200 000	Staff to operate simulation programmes		Example: cost of training a surgical resident in the operating room for four years	nearly \$50 000	<p>MEPI schools say it is expensive (cardiovascular system, orthopedics). Some low cost/quality models are not durable. Development costs are high.</p> <p>If use low-cost options (e.g. oranges for injections), or open source agreements, then the cost is lower.</p> <p>Development costs differ by country.</p>
No	Probably no	Uncertain	Probably yes	Yes	Varies																			
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No	Probably no	Uncertain	Probably yes	Yes	Varies																			
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ACCEPTABILITY	Is the option acceptable to most stakeholders?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not assessed in the stakeholders survey									
No	Probably no	Uncertain	Probably yes	Yes	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			
FEASIBILITY	Is the option feasible to implement?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not assessed in the stakeholders survey									
No	Probably no	Uncertain	Probably yes	Yes	Varies																			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																			

PICO B8 RECOMMENDATION: Should simulation methods be used in the education of health professionals?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings	The balance between desirable and undesirable consequences <i>is uncertain</i>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recommendation	<i>We recommend against the option</i>	<i>We recommend the option only in the context of rigorous research</i>	<i>We recommend the option in the context of close monitoring and evaluation</i>	<i>We recommend the option in the context of close monitoring and evaluation</i>	<i>We recommend the option</i>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Simulation methods should be used in the education of health professionals					
Justification	<ul style="list-style-type: none"> - Needed to acquire skills, accelerate learning - Allow for a variety of situations - Develop manual skills (can only learn by doing – through repetition) 				
Implementation considerations	<ul style="list-style-type: none"> - Availability of experienced staff - Availability of space and equipment - Seamless integration with the curriculum and a focus on developing priority competencies, based on population health needs - Cost 				
Key uncertainties	<ul style="list-style-type: none"> - Impact of simulation techniques on patient outcomes - Cost versus effectiveness 				
Monitoring and evaluation	<ul style="list-style-type: none"> - More data on its use in low-resource settings - Students performing a procedure an increased number of times versus without simulation - Ability to perform procedures that otherwise could not be performed 				
Research priorities	<ul style="list-style-type: none"> - Suggest postponing the identification of research priorities until a more expanded review of the literature is conducted - Good quality studies assessing effects on patient outcomes - Identifying methods to increase sustainability of benefits - Gender considerations 				

Direct entry of students

PICO B9: Should direct entry be used to increase the number of graduates from relevant undergraduate, postgraduate or other educational programmes into professional studies versus no direct entry of graduates from other relevant programmes?

Problem: Lack of access or barriers to entry of graduates from other health programmes.

Option: To increase the number of health professionals through entry from relevant undergraduate, postgraduate or other educational programmes into professional studies.

Comparison: No direct entry of graduates from relevant undergraduate, postgraduate or other educational programmes.

Setting: Global, with focus on low- and middle-income countries.

CRITERIA		JUDGEMENT						EVIDENCE				QUERIES TO PANEL
PROBLEM	Is the problem serious?	No	Probably no	Uncertain	Probably yes	Yes	Varies	There is a severe shortage of health workers and an inequity of distribution. The need for increasing the number of registered health professionals is a serious challenge. Direct Entry or Accelerated Degree Programs provide a quick and safe method to increase the number of health workers.				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	Are a large number of people affected?	No	Probably no	Uncertain	Probably yes	Yes	Varies	All health workers and health students				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Quantity	Quality	Relevance	Unintended effects	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are the anticipated undesirable effects small?	No	Probably no	Uncertain	Probably yes	Yes	Varies	A number of literature reviews were identified but no systematic reviews Quantity Anecdotal reports of increasing numbers of health workers but no evaluation studies directly addressed this				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
What is the certainty of the anticipated effects?	Very low	Low	Moderate	High	No evidence	Varies	- Some moderate evidence: o for improved retention (1 study – low-quality evidence) o job satisfaction. Quality Better outcomes or at least equivalence for: - critical thinking - passing rates for national exams - professional practice - clinical competence - leadership.					
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	Are the anticipated desirable effects large relative to the undesirable effects?	No	Probably no	Uncertain	Probably yes	Yes	Varies	Relevance No specific evidence identified				
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

	CRITERIA	JUDGEMENT	EVIDENCE	QUERIES TO PANEL																								
RESOURCE USE	Are the resources required small?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Main resource requirements <table border="0"> <tr> <td>Resource</td> <td>Costs</td> </tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> </table>	Resource	Costs	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
	No	Probably no	Uncertain	Probably yes	Yes	Varies																						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																							
Resource	Costs																											
_____	_____																											
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_____	_____																											
_____	_____																											
	Is the incremental cost small relative to the benefits?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-													
No	Probably no	Uncertain	Probably yes	Yes	Varies																							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																							
EQUITY	What would be the impact on health equity?	<table border="0"> <tr> <td>Reduced</td> <td>Probably reduced</td> <td>Uncertain</td> <td>Probably increased</td> <td>Increased</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Reduced	Probably reduced	Uncertain	Probably increased	Increased	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-													
Reduced	Probably reduced	Uncertain	Probably increased	Increased	Varies																							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																							
ACCEPTABILITY	Is the option acceptable to most stakeholders?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-													
No	Probably no	Uncertain	Probably yes	Yes	Varies																							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																							
FEASIBILITY	Is the option feasible to implement?	<table border="0"> <tr> <td>No</td> <td>Probably no</td> <td>Uncertain</td> <td>Probably yes</td> <td>Yes</td> <td>Varies</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	No	Probably no	Uncertain	Probably yes	Yes	Varies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There are number of these programmes already running in Australia, UK and USA													
No	Probably no	Uncertain	Probably yes	Yes	Varies																							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																							

PICO B9 RECOMMENDATION: Should direct entry be used to increase the number of graduates from relevant undergraduate, postgraduate or other educational programmes into professional studies be used versus no direct entry of graduates from other relevant programmes?

Balance of consequences	Undesirable consequences <i>clearly outweigh</i> desirable consequences in most settings	Undesirable consequences <i>probably outweigh</i> desirable consequences in most settings	The balance between desirable and undesirable consequences is <i>uncertain</i>	Desirable consequences <i>probably outweigh</i> undesirable consequences in most settings	Desirable consequences <i>clearly outweigh</i> undesirable consequences in most settings
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recommendation	<i>We recommend against the option</i>	<i>We recommend the option only in the context of rigorous research</i>	<i>We recommend the option in the context of close monitoring and evaluation</i>	<i>We recommend the option</i>	
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<p><input checked="" type="checkbox"/> Most of the evidence was from non-randomized parallel two group comparisons with no pre- and post- tests (Level III-c), however, the findings were consistent in showing equivalence in quality outcomes with potential to increase quantity outcomes. A Grade B level of moderate support.</p> <p>We are taking the question as relating to undergraduate (pre-qualification) education and to graduates.</p>					
Justification	-				
Implementation considerations	Consideration should be given to the type of pre-degrees as a number of studies were identified that evaluated the predictors of success. These studies were excluded but should be considered in any implementation				
Key uncertainties	-				
Monitoring and evaluation	-				
Research priorities	Standard outcome measurement				

Admission procedures

PICO B10: Should targeted admissions policies seek to increase the ethnic and geographical diversity of students and be supported by mechanisms to ensure completion of education programmes versus no targeted admissions policies and supportive mechanisms?

Problem: There is a disproportionate number of students admitted from higher social classes and dominant ethnic groups and there are weak mechanisms in place to facilitate the completion of academic courses by those entrants from underserved populations or from minority ethnic groups.

Option: To increase the number and diversity of students from different ethnic groups and geographical areas and provide support mechanisms to ensure completion of education programmes.

Comparison: No diversity of students and no support mechanisms for education programmes.

Setting: Global, with focus on low- and middle-income countries.

CRITERIA		JUDGEMENT						EVIDENCE				QUERIES TO PANEL
PROBLEM	Is the problem serious?	No <input type="checkbox"/>	Probably no <input type="checkbox"/>	Uncertain <input type="checkbox"/>	Probably yes <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>	Varies <input type="checkbox"/>	<p>There is substantial evidence to show that admissions of students from rural or poorer areas is unbalanced and some but less published evidence that there are insufficient numbers of women in some countries to produce a balanced workforce. Although issues of recruiting and retaining doctors in rural and remote service numerically dominant in the published literature found there are some studies on other categories of health worker, and reports relating to low- and middle-income countries.</p> <p>Few references were found to any linkage between admission procedures or criteria and the numbers of graduates produced. This is not surprising, given that the main determinants of the volume of outputs from training are the volumes of health workers needed/demanded and the capacity of training institutions.</p>				
	Are a large number of people affected?	No <input type="checkbox"/>	Probably no <input type="checkbox"/>	Uncertain <input type="checkbox"/>	Probably yes <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>	Varies <input type="checkbox"/>	<p>All undergraduate students</p> <p>There is a general, but not universal finding, that previous academic achievement is a good predictor of success in medical schools in Austria (Reibnegger et al 2010), Canada (Kularunga-Moruzi, Norman 2002), Croatia (Jankovic et al. 2002), Germany (Hansel et al. 2010), Holland (Urlings-Strop et al. 2009; Cohen-Schotanus et al. 2006), UK (Brown, Lilford 2008) and the USA (Mitchell 1990).</p> <p>The same broad conclusion is reached in some studies from developing countries, among them Bahrain (Al Nasir, Robertson 2001), Nigeria (Egbewale et al. 2009) and Sri Lanka (Hewage et al. 2011).</p> <p>Some evidence disputing the predictive validity of previous academic attainment is offered for the New Zealand (Collins et al. 1995; Poole et al. 2012) and for Pakistan (Huda et al. 2001) and Sri Lanka (De Silva et al. 2004 and 2006) and the USA (Basco et al. 2000).</p> <p>For nurse education, a meta-analysis carried out in the US (Grossbach, Kuncel 2011) found that standardized admission tests were effective predictors of performance in the National Council Licensure Examination for Registered Nurses. Pre-nursing grade point average was also effective, but to a lesser extent. In the UK, a study of an entering cohort of pre-registration Diploma of Nursing students concluded that students with higher level entry qualifications performed consistently better than those with lower level qualifications (McCarey et al. 2007). A Canadian study (Carpio et al. 1996) found that school grades in English and chemistry were the best predictors at entry stage of success in licensure examinations. A New Zealand study which look as the outcome performance in the first year of an undergraduate nursing programme (Shulruf et al. 2011) found that the best predictor of success was final year secondary school achievement as measured by the National Certificate of Educational Achievement Grade Point Average (NCEAGPA).</p> <p>A dissenting voice from the UK (Ofori 2000) argued that paper qualifications in psychology, sociology or biology should not be relied on as predictors of academic performance in their related nursing modules, and that age was a good predictor (mature students, defined as >34 years on entry, did better), a finding which has been reported from other studies, and is advanced in the cause of a more diverse student body.</p>				
BENEFITS & HARMS OF THE OPTIONS	Are the anticipated desirable effects large?	No <input type="checkbox"/>	Probably no <input type="checkbox"/>	Uncertain <input type="checkbox"/>	Probably yes <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>	Varies <input type="checkbox"/>	Quantity <input checked="" type="checkbox"/>	Quality <input type="checkbox"/>	Relevance <input checked="" type="checkbox"/>	Unintended effects <input type="checkbox"/>	
	Are the anticipated undesirable effects small?	No <input type="checkbox"/>	Probably no <input type="checkbox"/>	Uncertain <input type="checkbox"/>	Probably yes <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>	Varies <input type="checkbox"/>	<p>Selection</p> <p>The potential impact of selecting medical students of rural origin was quantified by Rabinowitz in a longitudinal study that evaluated the impact of the Physician Shortage Area Program (PSAP) in the USA. The PSAP combined selective admission criteria with a rurally orientated educational programme. On multivariate analysis, rural origin was the single variable most strongly associated with rural practice (OR 4.2, 95% confidence interval [CI] 2.8–6.3). Another strong influence that was rarely considered is the origin of the spouse. Rabinowitz found that 64% of rural physicians had spouses of rural origin; in Australia, doctors whose spouses had a rural background were</p>				