Annex 2: Descriptive evidence profiles

The following evidence tables have been prepared in order to present the large amount of valuable evidence describing various retention strategies. The tables provide further details on the studies included in the GRADE evidence profiles, as well as additional evidence concerning retention. Although some of the studies fall short of providing a comprehensive evaluation of the retention initiatives (some have an element of evaluation), they provide details on the types of interventions, issues surrounding implementation, contextual issues, prospective benefits of the schemes, recommendations for ways to improve the interventions, and other useful information. For policy-makers and others, the evidence in this Annex demonstrates the significant efforts that are already being made to retain health workers, and highlights the need for further research to fully understand the effects of retention schemes.

We would like to acknowledge and thank contributions from Frehywot S et al. *Compulsory service programme as a means of deploying and retaining health workers in rural, remote and underserved areas – a global analysis.* World Health Organization, Geneva, Switzerland, 2010 (in press).

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education	Australia	Rural clinical placement	Nurses	This study aimed to evaluate the effectiveness of a clinical placement support scheme for final year Bachelor of Nursing students as a recruitment strategy for rural and remote health-care services.	Quasi-experimental before-and-after study. All nursing students completed questionnaires that included demographic information, career path intentions, attitudes, etc.	"Over half (56%) of the rural clinical placement students indicated in their pre-test responses they would seek work in a rural setting in one year's time, compared with 29% of the metropolitan placement students. This difference increased in the post-test results, with 63% of rural clinical placement students wishing to work in a rural area in one year's time and only 13% of the metropolitan placement students wanting to do so."	Courtney M et al. The impact of a rural clinical placement on student nurses employment intentions. *The Collegian,* 2002, 9(1):12–18.
Education	Australia	Postgraduate medical placements in rural areas	Physicians	The New South Wales Rural Resident Medical Officer Cadetship Program was developed to overcome doctor shortages in rural areas. The study aimed to track the career choices and practice locations of those who received cadetships to see whether they were now working in a rural area.	This observational study tracked the career choice and practice locations of 107 medical students who received cadetships between 1989 and 1998. Questionnaires and databases were used to gather further information.	"Importantly, 43% of these former cadets were working in rural locations in 2004, compared with 20.5% of all medical practitioners nationally. Only 14% of the cohort of doctors in vocational training in 2002 expressed an interest in rural practice (31% of general practice trainees and 10% of non-general practice trainees). This suggests the Cadetship Program is an effective link between medical school and rural practice, particularly rural general practice, for both rural and metropolitan background students."	Dunbabin JS, McEwin K, Cameron I. Postgraduate medical placements in rural areas: their impact on the rural medical workforce. *Rural and Remote Health,* 2006, 6(2):481.
Education	Australia	Continuing medical education	Physicians	This study aimed to provide some evidence about the efficacy of rurally relevant continuing medical education (CME) programmes in retaining medical practitioners in rural and remote communities.	This was a qualitative study based on questionnaires. Doctors were asked to complete these questionnaires following their attendance at a CME workshop.	"Data from 429 respondents suggest that 94% agree or strongly agree that access to CME contributes to confidence in practising in rural and/or remote locations. Similarly, data suggest that 93% of respondents (n = 427) agree or strongly agree that access to CME alleviates professional isolation. When asked whether they were less likely to remain in rural practice without access to CME, 80% of respondents (n = 426) agreed or strongly agreed that they were less likely to remain without access."	White CD et al. Making a difference: education and training retains and supports rural and remote doctors in Queensland. *Rural and Remote Health,* 2007, 7:700.
Education	Australia	Rural curriculum, third year of training in a rural community	Physicians	This study wanted to find out whether graduates from the Flinders University Parallel Rural Community Curriculum programme and the Northern Territory Clinical School were more likely to choose rural career paths than graduates from the urban Flinders Medical Centre. Students from the rural Flinders programme and the Northern Territory Clinical School spend their third year in a rural community, whereas students in the urban programme remain in an urban tertiary teaching hospital.	Retrospective postal survey of 150 graduates. Graduates were asked survey questions concerning their preference for rural versus urban practice.	Graduates from the Flinders University Parallel Rural Community Curriculum programme and the Northern Territory Clinical School were more likely to choose rural career paths than graduates from the urban Flinders Medical Centre. The odds ratios were 19.1 (95% CI, 3.4–106.3; $P < 0.001$) and 4.3 (95% CI, 1.2–14.8; $P = 0.026$), respectively, after adjusting for age and rural background.	Worley P et al. Vocational career paths of graduate entry medical students at Flinders University: a comparison of rural, remote and tertiary tracks. *Medical Journal of Australia*, 2008, 188:177–178.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education	Australia	Rural curriculum	Physicians	This study presents a comprehensive overview of the Parallel Rural Community Curriculum (PRCC) programme led by Flinders University. It includes an evaluation of the first cohort of students' experience of the course in relation to curriculum structures, recruitment, content and lessons learnt.	A series of structured interviews were undertaken as well as a review of student academic performance (comparing those in the normal stream with those in the PRCC stream).	When comparing mean percentages of fifth year exam results, students from the rural curriculum course gained better results than the urban based medical curriculum in all the following: Medical, surgery, obstetrics and gynaecology, paediatrics, psychiatry and clinical examination. PRCC students expressed greater access to patients and clinical learning opportunities than their mainstream counterparts.	Worley P et al. The Parallel Rural Community Curriculum: an integrated clinical curriculum based in rural general practice. *Medical Education,* 2000, 34:558–565.
Education	Canada	Rural education programme	Student physicians	Canada's Memorial University (MUN) rural targeting scheme. The university, situated in rural Newfoundland, has been working towards increasing the number of rural physicians for several decades. The MUN residency programme includes a strong rural component and gives priority to students from rural Newfoundland and Labrador.	The study design included data collection from class lists, alumni and postgraduate databases, and a review of all MUN graduates between 1973 and 1998. A multiple logistic regression model was used for data analysis.	Although only small, the MUN has made a significant contribution to the rural physician supply in Newfoundland and Labrador and the rest of Canada. In 2004, 167 (12.6%) MUN graduates worked in rural Canada and 81 (6.1%) MUN graduates worked in rural areas of the province. Those who were more likely to practise in rural areas were graduates with a rural background (odds ratio 1.95; 95% CI, 1.38–2.76), those who had done residency training at MUN (odds ratio 1.56; 95% CI, 1.06–2.29) and family physicians–general practitioners (odds ratio 6.64; 95% CI, 4.31–10.23). 74.3% of those working in rural Canada had residency training at MUN, which shows the success of MUN trying to encourage and promote rural health practice.	Mathews M, Rourke JTB, Park A. The contribution of Memorial University's medical school to rural physician supply. *Canadian Journal of Rural Medicine*, 2008, 13(1):15–21.
Education	Canada	Influence of rural background on practice location	Physicians	"In a previous prospective study, students from rural backgrounds were found to be significantly more likely to consider rural practice than their urban-raised peers. The purpose of this study was to determine whether the students with rural backgrounds who participated in the original investigation were more likely than their urban-raised peers to be currently engaged in rural family practice."	A follow-up to a previous prospective study to determine whether rural background students entered rural family practice at a greater rate than their urban background peers.	Rural background students who subsequently completed family medicine residency programmes were approximately 2.5 times more likely to enter rural practice than their urban background peers. Of the 78 family practitioners, 22 (29%) were raised in a rural community. Seven (32%) of the 22 rural background students were practising in a rural community, as were seven (13%) of the 56 urban background students. (RR=2.55)	Woloschuk W, Tarrant M. Do students from rural backgrounds engage in rural family practice more than their urban-raised peers? *Medical Education,* 2004, 38:259–261.
Education	China	Location of medical schools and their influence on the provision of rural physicians	Physicians	This study was set up to compare the role of metropolitan and rural medical schools in the provision of rural physicians in China.	The study randomly selected 12 metropolitan schools and 12 rural medical schools. Data were collected from their web sites and questionnaires sent to the schools.	Two metropolitan schools with provincial government affiliation indicated that 4.9% (21/430) and 9.8% (52/530) of their graduates secured employment in rural hospitals. The remaining metropolitan schools registered no graduates entering rural practice. All rural schools graduated some physicians who were currently working in rural areas. "The primary finding of the study was that rural medical schools ran a smaller undergraduate course of clinical medicine, and produced fewer graduates than metropolitan schools in 2000. Rural medical schools, however, are more likely to offer designated places for rural students and produce rural physicians than metropolitan schools."	Wang L. A comparison of metropolitan and rural medical schools in China: Which schools provide rural physicians? *Australian Journal of Rural Health,* 2002, 10:94–98.
Education	Democratic Republic of the Congo	Location of medical schools and their influence on the provision of rural physicians	Physicians	The purpose of this study was to compare the location of graduates from an urban and a rural located university in the Democratic Republic of the Congo.	This comparative study collected data from the two schools. It used both university records on their graduates and followed up with each graduate to obtain their current practice location.	"In total, 97.7% of graduates from the rural-located medical school were employed in the province where they trained, the majority (81.4%) in rural areas. In contrast, 40.0% of graduates from the urban-located school were employed in the province where they trained, with 23.7% working in a rural area."	Longombe AO. Medical Schools in rural areas – necessity or aberration? *Rural and Remote Health,* 2009, 9:1311.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education, regulatory	New Zealand	Compulsory externship in a rural practice	Pharmacists	This study revealed student perceptions of the compulsory externship in a rural practice as well as their opinions of rural pharmacy work, both before and after their placement. All pharmacy students at Otago University School of Pharmacy were required to do this one-week placement in 2006.	Before-and-after study using questionnaires, with both quantitative and qualitative questions. These were administered to all students one week before and one week after their placement.	Significantly more students overall indicated post-externship that they would consider rural work than those did pre-externship (P = 0.0001). Pre-externship, 48% of students (n = 51 of 106; 95% CI, 0.39–0.58) stated they would consider rural work, increasing to 73% post-externship (n = 86 of 118; 95% CI, 0.65–0.81). The proportion of students of rural origin indicating they would consider rural work increased from 70% to 80%. The proportion of students of urban origin indicating they would consider rural work increased significantly from 38% to 67%.	Capstick S, Beresford R, Gray A. Rural pharmacy in New Zealand: Effects of a compulsory externship on student perspectives and implications for workforce shortages. *Australian Journal of Rural Health,* 2008, 16:150–155.
Education	Uganda	Rural exposure as part of rural curriculum for health workers	Physicians and nurses	The Makerere University Faculty of Medicine designed and implemented a problem-based learning (PBL) curriculum in which health students experience training in rural community placements.	Questionnaire-based study. Questionnaires were sent to a group of the PBL curriculum students as well as a group who were with the traditional curriculum.	Overall, there was no marked difference in motivation to seek medical careers between graduates of different curricula. However, community-based training was identified as the main factor shaping the values and attitudes of those who were in favour of rural practice and were confident and willing to work in a rural area.	Kaye DK, Mwanika A, Sewankambo N. Influence of the training experience of Makerere University medical and nursing graduates on willingness and competence to work in rural health facilities. *Rural and Remote Health,* 2010, 10:1372.
Education	United States of America	Rural medical education programme – Physician Shortage Area Programme (PSAP)	Student physicians	Jefferson Medical College (JMC) began the PSAP to specifically recruit and admit medical school students from rural backgrounds intending to practise family medicine in rural areas. Through this programme, students receive financial aid and advanced training as an incentive to practise in a rural area.	The study was based on a retrospective cohort study of graduates from 1978 to 1993. Additionally, data on physician speciality were gathered from the Jefferson longitudinal study of medical education and a univariate analysis of data was conducted.	There was an 87% retention rate of PSAP graduates (87% had been practising rural family medicine for at least 5-10 years). "A total of 150 graduates from the classes of 1978 to 1991 of all seven Pennsylvania allopathic medical schools were practising family medicine in rural Pennsylvania in 1997. 21% (32) of these rural family physicians were PSAP graduates even though they represent only 1% of all graduates from those schools." Of those who were still working as rural primary care physicians in 1999 (59.7% of the JMC graduates), growing up in a rural area and attending college in a rural area were univariately related to retention. Expectations of high income or medical school debt were not factors in choosing rural primary care as a career. PSAP graduates are four times more likely than non-PSAP graduates to practise in rural or underserved areas. After demonstrated success in gaining long-term rural service, PSAP has been expanded to five other colleges in the USA.	Rabinowitz HK. Recruitment, retention, and follow-up of graduates of a program to increase the number of family physicians in rural and underserved areas. *New England Journal of Medicine*, 1993, 328(13):934–939. Rabinowitz HK et al. A program to increase the number of family physicians in rural and underserved areas: impact after 22 years. *Journal of the American Medical Association*, 1999, 281(3):255–260. Rabinowitz HK et al. Critical factors for designing programs to increase the supply and retention of rural primary care physicians. *Journal of the American Medical Association*, 2001, 286(9):1041–1048. Rabinowitz HK et al. Long-term retention of graduates from a program to increase the supply of rural family physicians. *Academic Medicine*, 2005, 80:728–732.
Education	United States of America	Rural Medical Education programme (RMED) of the State University of New York Upstate Medical University (rural clinical placement)	Physicians	This rural medical education programme involves a 36-week clinical experience in a rural community for medical students.	A comparative study comparing practice locations of those who had completed RMED with those who had not. The study involved an analysis of secondary data from various databases, interviews with hospital administrators and a comparison of licensing examination scores.	"A greater percentage of former RMED students practiced in rural locations [22/86 (26%)] than did non-RMED students [95/1,307 (7%)]. 91% (69/76) of former RMED students were satisfied with their location, and 84% (64/76) believed that RMED was important in helping them choose a location. Hospital administrators viewed the programme highly because it helped them recruit physicians and benefitted their medical staff."	Smucny J et al. An evaluation of the Rural Medical Education Program of the State University of New York Upstate Medical University, 1990-2003. *Academic Medicine,* 2005, 80:733–738.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education	United States of America	Rural Medical Education programme (RMED) – University of Illinois (IL)	Physicians	The RMED programme, launched in 1993, recruits rural students who express a desire to practice rural medicine. It then trains them using a specifically rural-focused curriculum. After graduation they are expected to fulfil their pledge to work in a rural community.	This study included an in-depth description of RMED – conception, finance, how to recruit students, curriculum, etc., and tracked graduates through university and census sources.	"To date, there have been some 118 RMED graduates. Of the graduates in practice, 55 (85%) practice in primary care, 48 (74%) practice in IL, of which 44 (68%) practice in rural IL. Thus, the programme has begun to achieve its targeted endpoints." There is currently a 65-70% success rate in terms of physicians returning to rural communities. Expansion of model: considering its success, in 2000, the IL Board of Education created the Center for Rural Health Professions Education, Evaluation and Research (RPEER). This centre wants to improve rural service through emphasizing recruitment and retention of all health professionals, not just physicians.	Salafsky B, Glasser M. Addressing issues of maldistribution of health care workers. *Annals Academy of Medicine*, 2005, 34(8):520–525.
Education	United States of America	Rural health fellowships	Physicians	This study reviewed the graduate outcomes of nine rural health fellowship programmes in the USA. It compared the practice location of graduates from these nine rural health fellowship programmes with those of maternal health and obstetrical fellowships.	This observational study used data from several databases and a survey questionnaire was sent to each operational programme to gather information on graduates and several outcomes (such as current practice).	"Fellows who completed the rural health programs have a higher tendency to locate their practice in rural settings than do fellows who completed obstetrical programs. More than 75% of these fellowship graduates are practicing in rural communities with a population of less than 25 000. Only 25 to 35% of those who complete maternal health and obstetrical fellowships are practicing in rural communities of the same population size."	Acosta DA. Impact of rural training on physician workforce: The role of postresidency education. *Journal of Rural Health*, 2000, 16(3):254–261.
Education	United States of America	New Mexico rural education scheme	Physicians	The University of New Mexico (UNM) has recruiting preferences for rural background applicants, 15 family medicine resident positions in rural and frontier communities, rural medicine sites and state-subsidized locum programme to provide practice-relief to rural practitioners.	Cross-sectional study conducted with all 317 residency graduates from 1974 to 2004. Data were collected from various databases, including the location report database of UNM graduates.	The percentage of family medicine graduates, including those trained in Albuquerque and the three rural programmes, who stayed in the state and practised in rural areas (55.5% and 25.9%, respectively) was significantly higher than that of all other UNM specialty graduates combined (23% and 10%, respectively).	Pacheco M et al. The impact on rural New Mexico of a family medicine residency. *Academic Medicine*, 2005, 80(8):739–744.
Education	United States of America	New Mexico (NM) rural education scheme	Physicians	The University of New Mexico (UNM) rural education scheme provides scholarships, grants, rural focused curriculum and offers unique rural medical teaching opportunities. The admission process encourages students from rural and remote communities to apply.	The study design included a document review, data collected from the school (applicant numbers, origin of students, etc.), a survey of students' views and a descriptive overview of programme, curriculum, etc.	There has been notable success in increasing the number of physicians available in NM, a largely rural state. "One third of the licensed physicians in the state are graduates of the UNM school of medicine or its residency programmes…" "84% of physicians who were graduates of both the school of medicine and one of its rural family medicine residencies entered long-term practice in rural NM." 65% of those students who accepted the offer of admission were from rural communities. Results of the survey of 317 graduates from 1974 to 2004 showed that all students were "satisfied" or "very satisfied" with the academic courses, student support and living-learning community aspects of the programme. .	Cosgrove EM et al. Addressing physician shortages in New Mexico through a combined BA/MD program. *Academic Medicine,* 2007, 82(12):1152–1157.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education	United States of America	Rural Physician Associate Program, Minnesota	Physicians	The Rural Physician Associate Program (RPAP) in Minnesota is a rural-targeted education programme. Third year medical students are assigned to primary care physicians in rural communities for nine months. During this time they experience the realities of rural practice and the full scope of rural primary care.	Longitudinal study using data on RPAP students from their application to present. All students are surveyed every three years to keep this database updated.	Of those currently in practise, 44% have practised in a rural setting all of the time, 42% in a metropolitan setting and 14% have chosen both, with more than 50% of their time in rural practise. The study concluded that rural origin has only a small association with choosing rural practise. (58% of RPAP students with a rural background currently practise in rural settings while 40% raised in urban areas currently practise in rural settings.) The proportion of RPAP graduates practising in rural settings (50%) is substantially higher than national trends.	Halaas GW et al. Recruitment and retention of rural physicians: Outcomes from the rural physician associate program of Minnesota. *Journal of Rural Health*, 2008, 24(4):345–352.
Education	United States of America	Family practice residency programmes and their influence on the graduation of rural family physicians	Physicians	This study sought to describe the current scope of rural medical education in family practice residencies and assess the relationship between certain residency characteristics and the graduation of rural family physicians.	This was a survey-based study, gathering information from a questionnaire survey emailed to directors of all non-military family practice residency programmes. Information was also gathered from the American Academy of Family Physicians and census data. Data were retrieved on 353 programmes.	"Family practice residents provided 3742 months of medical services to rural communities in 1994 on required rural rotations alone." Family practice residency programmes that graduated more rural physicians were located in more rural states and had more required rural months. For example, for those family medicine residency programmes with 0 rural months required, 24.4% of graduates worked in rural areas, whereas for 4–6 required rural months had 51% and more than 22 required rural months had 68.5% of their graduates working in rural areas.	Bowman RC, Penrod JD. Family practice residency programs and the graduation of rural family physicians. *Family Medicine,* 1998, 30(4):288–292.
Regulatory	Australia	Compulsory rural service, with incentives, education-linked	Physicians	Required rural health rotation The University of Melbourne Department of Rural Health requires all medical students to participate in a four week rural health rotation in north-east Victoria. Rural and indigenous health issues are served, and one aim is to influence students towards consideration of rural practice.		Although the communities involved are very supportive of this programme, students and health professionals question its cost, utility and sustainability.	Liaw S et al. A compulsory experiential and inter-professional rural health subject for undergraduate students. *Rural and Remote Health*, 2005, 5:460.
Regulatory	Bolivia	Compulsory rural service, "Medicatura Rural", with incentives, employment-linked	Physicians	The Plurinational State of Bolivia instituted its compulsory rural service programme, based on a similar programme in Ecuador, in 1979. More medical students graduate yearly in the Plurinational State of Bolivia than there are rural placement sites available. If a health worker cannot find a rural placement at the time of graduation, they may practice, but must pay the Government 5% of their salaries for a specified time to compensate for the cost of their education. This money is intended to finance programme administration. Participation is tied to recommendations for residency and employment in the public sector.		In 1996, 438 physicians graduated from the Plurinational State of Bolivia's medical schools, but only 303 compulsory service placements were available.	Cavender A, Alban M. Compulsory medical service in Ecuador: The physician's perspective. *Social Science and Medicine*, 1998, 47(12):1937–1946.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	Ecuador	Compulsory service, as a condition to obtaining a licence to practise	Physicians, dentists and nurses	In 1970, Ecuador introduced compulsory service for all graduates of the country's medical, dental and nursing schools as a condition for obtaining a licence to practise. Since then, over 13 000 physicians have participated in the scheme, which was developed to ensure more rural health coverage and to try to reduce the comparatively high morbidity and mortality rates within rural areas. Rural physicians are usually placed in small hospitals or primary care clinics.	The study design included a self-administered questionnaire of 127 respondents (all physicians), four visits to rural placement sites, observational analysis and feedback. The respondent sample included 19 out of 21 provinces.	59% received no orientation programme before their placement. 16% of those who received orientation found it unsatisfactory. 58% reported housing, food or transportation challenges, and 35% reported significant difficulties in these areas. Transportation ranked highest as a problem, followed by communication, housing, food, access to water and electricity. 38% of respondents said they experienced problems with cultural differences. Several specifically mentioned language barriers. Possible decrease in quality of care: "Aside from promoting feelings of isolation, lack of access to local and long distance telephone services also prevents the inexperienced and perhaps not very confident medico rural from consulting with more experienced physicians about problems of diagnosis and treatment."	Cavender A, Alban M. Compulsory medical service in Ecuador: The physician's perspective. *Social Science and Medicine*, 1998, 47(12):1937–1946.
Regulatory	India	Compulsory service in the State of Kerala	Physicians	Currently, students graduating from government medical colleges within Kerala must work in a rural area as posted by the state for a period of one year.		Students of five state-run medical colleges in Kerala, India planned a strike on 6 October 2008 to demand repeal of the "two-year" (actually three-year) compulsory service bond for public medical school graduates. Organizers of the strike stated that the one-day planned action could be preliminary to an indefinite strike "if the Government fails to meet our demand". After the strike, the Government agreed to reduce the compulsory service requirement to one year.	[Anonymous]. Kerala medical students protest government service bond. Thaindian News (Bangkok), 3 October 2008 (http://www.thaindian.com/newsportal/health/kerala-medical-students-protest-government-service-bond_100103146.html , accessed 25 March 2010). [Anonymous]. Kerala medicos end protest after government assurances. Thaindian News (Bangkok), 6 October 2008.
Regulatory	Indonesia	Compulsory service, incentives and subsidized training	Physicians	Indonesia has compulsory service for all physicians, which is a prerequisite to their obtaining a licence to practise. Those who opt for remote locations are provided with more financial incentives and a considerably higher chance of gaining a subsequent civil service appointment (90% chance as compared with only 10% for those in non-remote areas) and subsidized training opportunities.	The study design was based on a before-and -after study to determine location of graduating medical students (the revealed preference analysis). It also used survey data on choices among hypothetical assignments to determine physicians' preferences over a set of characteristics describing compensation, career prospects and location amenities (stated preference analysis).	"The proportion willing to go to ordinary or remote posts in the outer islands increased almost threefold, from about 17% to about 50%, after the incentives were introduced. The proportion willing to go to very remote posts increased more than fivefold, from 3.1% to 17.8% [among males]." Before the new set of incentives, in one batch of students, only 5.6% of males and 1.7% of females volunteered to go to very remote areas in the outer islands. Students from outer island faculties are far more likely to volunteer for remote and very remote outer island assignments than are students from Java/Bali faculties." (75% predicted probability of those from outer island, 17% probability of those from Java or Bali.)	Chomitz KM et al. What do doctors want? Developing incentives for doctors to serve in Indonesia's rural and remote areas. Washington DC, The World Bank, 1998 (Policy Research Working Paper No. 1888). (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1998/03/01/000009265_3980429111129/additional/116516322_20041117172041.pdf , accessed 17 March 2010).
Regulatory	Iraq	Compulsory service	Physicians	One year of rural service is compulsory for all medical doctors.		Iraq's rural areas are served by very few doctors other than those currently completing their mandatory service period.	Myers W, Behringer B, Olsen M. Rural health in Iraqi Kurdistan [Letter]. *The Journal of Rural Health*, 2005, 21(1):1–2.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	Kenya	Compulsory service with incentives	Physicians	After completing their internships, physicians in Kenya are registered with the Medical Practitioners and Dentists Board. To gain scholarships for postgraduate training, they must work in a public facility for three years. Priority consideration is given to physicians who work in so-called "hardship areas". Physicians may also be bonded by provincial or private organizations that pay for their education in return for working in the institution for a specified period.	This was an observational study. A review of the literature was conducted and views of physicians sought through focus group discussions regarding compulsory service.	The supply of physicians in Kenya is greater than the demand. However, there is significant maldistribution, leading to both unemployment and understaffing. Focus group discussants suggested that: bureaucracy be minimized and administration streamlined, including use of HMIS systems and monitoring and evaluation of programmes; non-financial encouragement, such as enhanced status, be used; personnel be given opportunities to continue education, including management education; and remuneration, including pay, support for family needs, and health care be improved.	Ndetei DM, Khasakhala L, Omolo JO. *Incentives for health worker retention in Kenya: An assessment of current practice.* Harare, Regional Network for Equity in Health in Southern Africa (EQUINET), 2008 (Discussion Paper Series No. 62).
Regulatory	Japan	Jichi Medical University (JMU) bonding scheme	Student physicians	JMU began a new and unique "home prefecture recruiting scheme" in 1972 with the aim to produce rural doctors and distribute them evenly nationwide. Students who attend JMU are fully-funded by their prefecture Government to study medicine; they sign a contract bonding them to work in their home prefecture's medical institutions for nine years after graduation. This obligation includes a 5/6 year rural dispatch to areas chosen by their home prefecture. If they breach the contract, doctors must pay all their medical school expenses in one lump sum.	The study design included a retrospective cohort study, as well as baseline data collected from matriculation and graduation of students (1972–1991). National population census data were used and a multivariate analysis conducted of personal factors, sex, population, physician ratio, etc.	1477 graduates from JMU were reviewed and surveyed in 2000, 2004 and 2006. On average, 69.8% of JMU graduates remained in their home prefectures for at least six years after their compulsory service. The rates varied from 45.5% to 93.3%. If settlement is defined as being in a home prefecture at least one out of the three time points, the settlement rate of post-obligation JMU graduates rises to 76.3%. Among the prefectural variables, the number of physicians per 100 000 population and the number of clinics and hospitals per 100 000 population were negatively correlated with settlement rate of the prefecture. Therefore, an interesting conclusion of the study is that the prefectures with a relative shortage of physicians had higher settlement rates. "The cumulative rate of JMU graduates who completed the contract among all the graduates is over 95% [completion rate]." JMU graduates only account for 0.7% of all physicians in Japan, so the impact of the JMU distribution of physicians is small. However, because the JMU has proven so successful, the Japanese Government has begun planning and implementing similar interventions on a broader scale. For example, the Government recently submitted a budget to create 'rural quotas' with an obligatory work period of approximately 6–7 years of rural service for most of the 80 medical schools in Japan. Female sex was negatively associated with home prefecture settlement.	Matsumoto M, Inoue K, Kajii E. Long-term effect of the home preference recruiting scheme of Jichi Medical University, Japan. *Rural and Remote Health*, 2008, 8(920):1–15.
Regulatory	Marshall Islands	Different types of health workers – health assistants	Health assistants	This study discusses the training of indigenous people from the Marshall Islands as health assistants in order to provide health services to their local communities and attempts to assess the effectiveness of the programme.	This is a descriptive observational study and explains the training of the health assistants. The evaluation considered the number of health centres opened and test scores of the health assistants.	The study found that eight new health centres came into operation as a result of the contribution of the 14 graduate health assistants. New graduates also replaced four retired health assistants, thus ensuring continuing health coverage for local communities.	Keni BH. Training competent and effective primary health care workers to fill a void in the outer islands health service delivery of the Marshall Islands of Micronesia. *Human Resources for Health*, 2006, 4(27):1–8.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	Mozambique	Different types of health workers	Assistant medical officers trained for surgery – *Técnicos de cirurgia* (TCs)	The purpose of this study was to understand and document the obstetric surgery performed by TCs and to investigate their retention at district (largely rural) level.	Cross-sectional study of surgical procedures during 2002 and a longitudinal study of TCs compared with doctors graduating in 1987, 1988, 1996.	In district hospitals, TCs conducted 92% of 3246 operations. Retention of TCs and medical doctors at district hospital level differed markedly: after seven years, 88% of the TCs remained in post compared with none of the medical doctors.	Pereira C et al. Meeting the need for emergency obstetric care in Mozambique: work performance and histories of medical doctors and assistant medical officers trained for surgery. *British Journal of Obstetrics and Gynaecology*, 2007, 114(12):1530–1533.
Regulatory	Mozambique	Compulsory service, with incentives	Health workers	Each newly graduated health worker is assigned to a provincial health department, where provincial health authorities decide where, specifically, the new staff member will be deployed for his/her compulsory service year. This system often takes many weeks or months, which is seen as a de-motivating influence on the health workers. Rural staff are more rapidly advanced in their careers due to a 50% bonus in counting their years in service. This may lead to personnel being promoted ahead of their peers and, when the person is rotated to an urban hospital, may lead to less experienced doctors supervising more experienced colleagues. Few incentives are available.		Between 1992 and 2002 there was a "noticeable trend towards greater equity" in health worker availability in urban and rural areas. Deployment of staff to rural areas has been slow and poorly matched to personnel skills. Delays in deployment are cited as being detrimental to staff motivation. The HR system is overly bureaucratic. In the future, budget constraints may mean that the national health service is unable to absorb all new graduates.	Ferrinho P, Omar C. The human resources for health situation in Mozambique. Washington DC, The World Bank, 2006 (Africa Region Human Development Working Paper Series No. 91).
Regulatory	Nepal	Compulsory service, with incentives	Physicians	Nepal withholds doctors' licences until an unspecified length of time is served in the public sector. Doctors report that they are often transferred between rural postings.		Personnel feel "trapped" in rural areas: the income is insufficient for them to support their families, and there are few employment opportunities for spouses. These factors detract from personnel remaining in the rural areas after completion of the requirement. Doctors noted that, in rural areas, high workloads and no available relief (due to being the only doctor in the area) meant that they were unable to attend conferences or continue their medical education. Lack of educational opportunities for doctors' children in rural areas discouraged doctors from remaining there.	Butterworth K, Hayes B, Neupane B. Retention of general practitioners in rural Nepal: A qualitative study. *Australian Journal of Rural Health,* 2008, 16:201–206.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	Nigeria	Compulsory service, with incentives	Medical students	The National Youth Service Corps programme, which began in the 1970s, compelled all graduates from tertiary institutions (including medical schools) to complete one year of compulsory service. Personnel get no choice as to where they are allocated; over 90% are assigned to posts in rural areas. This study reports on a survey of medical students that included the question "Would you be ready to serve in a rural area in the country if so required by the Government?" and a follow-up looking for indications of how long they would be willing to serve.		Noted factors related to attitude towards rural service include being from a rural area, professional life plan, exposure in training to rural areas, lack of facilities in rural areas, gender etc. "Clinical training did not significantly affect [medical graduates'] attitude towards the compulsory 1 year National Youth Service Corps which may involve their service in the rural areas after graduation." "It is a universal experience that highly trained professionals gravitate towards large urban centres for their practice, leaving the rural areas without these essential services." Although more than 90% of surveyed students agreed that "doctors should not abandon rural areas to less well-trained workers", only 42% would be willing to commit two or more years of service in a rural area after their clinical training.	Asuzu M. The influence of undergraduate clinical training on the attitude of medical students to rural medical practice in Nigeria. *African Journal of Medical Science,* 1989, 18:245–250.
Regulatory	Puerto Rico	Compulsory service, with incentives	Mixed health workers	15 different types of health workers would have been universally required to serve in the public system for one year as a prerequisite to licensure. The requirement was later abridged due to lack of placement sites for all graduates. Personnel are listed in one of four categories: those who had studied under Department of Health scholarships, those who received scholarships from other government agencies, "volunteers" and "non-volunteers." Available placements are assigned to qualified personnel in the order of their category. If no slots are available, his/her service is forgiven with no penalty. Graduates list their five preferred municipalities for service location.		"Undoubtedly, the legislation has served to correct the most obvious gaps and glaring deficiencies in the distribution of health manpower." In 1977, 16 of 78 municipalities had no physician. In 1981, every local jurisdiction had at least one doctor. After programme initiation, laboratories and hospitals often operated at capacity, thereby lowering per-unit care costs. In 1979, 75% of general physicians were assigned at the primary care level. The compulsory service personnel lobbied successfully for better facilities, thereby upgrading equipment and supplies in some localities. The staggered start times for candidates have resulted in poor continuity of care as one professional leaves a location before a replacement arrives.	Ramirez de Arellano A. A health "draft": Compulsory health service in Puerto Rico. *Journal of Public Health Policy*, 1981, 2(1):70–74.
Regulatory	South Africa	Compulsory community service (CCS)	Physicians	CCS was introduced in 1997 as part of an initiative to address the inequitable distribution and retention of doctors. Doctors must complete one year of community service, usually within in a rural area before they gain their first professional post.	The first part of this study was a descriptive qualitative study consisting of semi-structured interviews with key informants in CCS hospitals, as well as focus group discussions and observations. The second part of the study was a cross-sectional analytical study which used an anonymous questionnaire sent to all CCS doctors.	92% of all of those who were initially eligible for CCS took up posts. Most doctors felt they improved their competencies in the areas of making independent decisions, gaining confidence and learning new skills. The effect on the health system was seen in better staffing levels in many rural hospitals, more frequent visits to outlying clinics and shorter outpatient queues in some instances. Of the 1088 CCS doctors who reported for duty in 1999, less than one quarter (259) were placed in facilities that qualify for the rural allowance, indicating "inhospitable" rural situations.	Reid SJ. Compulsory community service for doctors in South Africa – an evaluation of the first year. *South African Medical Journal*, 2001, 91(4):329–335.

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Regulatory	South Africa	Compulsory community service (CCS)	Physicians	CCS was introduced in 1997 as part of an initiative to address the inequitable distribution and retention of doctors. Doctors must complete one year of community service, usually within in a rural area before they gain their first professional post.	This study was a qualitative study in which three focus group interviews were conducted to gain perceptions of CCS. Observational analysis was conducted as well as the direct feedback through interviews with CCS doctors.	Health service delivery: CCS led to reports of decreased work pressure. There was a perceived reduction in referrals from the clinics and a decreased waiting time in hospitals with previous staff shortages, but also reports of the CCS doctors taking much longer in patient consultations than senior doctors. Reports that CCS doctors lack procedural skills and experience, which impact negatively on the pace of consultations. Hospital managers reported a lack of continuity of care considering CCS doctors leave after one year. Perceived increase in patient utilization, but CCS doctors wasting resources. Felt that communities were receptive to CCS doctors yet their community impact could be better enhanced through improved transport, etc. CCS does provide constant manpower to underserved areas but there is poor retention of CCS doctors once they have finished the mandatory period due to lack of posts, etc. Impact on rural health team: Reports of CCS doctors helping to enhance racial integration, but also reports of negative relationships due to the feelings of being forced to work in rural areas against their wishes. The majority of hospital managers indicated that CCS doctors are not given enough social, administrative and clinical support. "The hospital managers interviewed in this study perceived CCS as having had a positive impact on the supply of needed manpower, health service delivery and patient care."	Omole OB, Marincowitz G, Ogunbanjo GA. Perceptions of hospital managers regarding the impact of doctors' community service. *South African Family Practice*, 2005, 47(6):55–59.
Regulatory	Turkey	Compulsory service	Physicians	Compulsory service for 2–4 years from 1981 to 1995.	This study presents a comparison of physician distribution in 70 districts in Turkey during and shortly after the abolition of the 2–4 year compulsory service scheme.	In 2000 (after the requirement was lifted), physicians were more likely to work in locations with better socioeconomic conditions than physicians who graduated in 1990. Despite the programme's unpopularity among doctors, it was effective at mitigating an urban/rural staffing discordance.	Erus B, Bilir A. Obligatory service requirement and physician distribution in Turkey. *European Journal of Public Health*, 2007, 17(Suppl. 2):S175.
Regulatory	Venezuela	Compulsory service	Physicians	Venezuelan postgraduates must work in "Barrio Adentro" for two-year residencies, after which the new doctors will have the option to stay on if they so choose.		The programme is opposed by the Bolivarian Republic of Venezuela's Medical Federation, which contends that the country already has enough doctors and that Venezuelan law already assures medical personnel work in underserved communities. This paper contends that, although Article 8 of the Law of the Exercise of Medicine requires doctors to spend a year in an underserved area after medical school, many new doctors find ways to avoid working in the poorest barrios.	Maybarduk P. A peoples' health system: Venezuela works to bring healthcare to the excluded. *Multinational Monitor,* 2004, 25(10) (http://liberationhealth.org/documents/venezuelaapeopleshealthsystem.pdf, accessed 25 March 2010).
Regulatory	Zimbabwe	Compulsory service, with incentives	Nurses and physicians	Bonding for nurses and doctors for three years after qualification was instituted in 1997. Doctors receive a practice certificate only after completion of the bonding period.		The paper categorizes bonding arrangements as "a controversial measure and often difficult to use." In general, poor reception by the health workers bound, in conjunction with poor enforcement by governments, may lead to health workers ignoring the requirement or to their leaving immediately upon completion of their time of service. "…The best retention strategies appear to be those that combine financial and non-financial incentives."	Dambisya M. *A review of non-financial incentives for health worker retention in east and southern Africa.* Harare, Regional Network for Equity in Health in Southern Africa (EQUINET), 2007 (Discussion Paper No. 44) (http://www.equinetafrica.org/bibl/docs/DIS44HRdambisya.pdf, accessed 24 March 2010).

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Financial incentives	Australia	Rural retention programme (RRP)	Physicians	The RRP began in 1999 to provide financial incentives to long-serving doctors in rural and remote areas experiencing difficulties in retaining general practitioners (GPs).	The study was based on a review of relevant documents and reports as well as interviews with RRP grant recipients and key stakeholders (policy-makers, etc.)	There has been a steady increase in the number of RRP recipients and the total amount paid under the RRP has increased 70% between 1999 and 2005. "The CPS has consistently achieved higher retention rates, from 86% one year after initial payment to 65% after five years. Retention rates for the FPS decline from 66% one year after initial payment to 31% after five years. The overall retention rate for the RRP at five years after initial payment is 63%." GPs reported that they would be more likely to consider leaving a rural or remote area if RRP was taken away; others would seriously consider early retirement without the RRP. However, interviews also highlighted that the total remuneration package offered to rural GPs is more important for retention than the RRP.	Gibbon P, Hales J. *Review of the rural retention program – Final report.* Canberra, Department of Health and Ageing, 2006 (http://www.health.gov.au/internet/main/publishing.nsf/Content/751B9B296D05A4C8CA25741E0079E487/$File/review.pdf, accessed 17 March 2010).
Financial incentives	Ghana	Additional duty hour allowance (ADHA)	Physicians, nurses, pharmacists, laboratory and X-ray technicians	Introduced in 1998/1999, the ADHA allows virtually all health staff to claim overtime pay. Initially designed to satisfy health workers' demands, it was then transformed into a performance incentive and a direct retention strategy by increasing salaries.	This study design involved semi-structured interviews with key informants and a limited document review.	Caused budget cuts in other ministries and tensions between cadres over how many additional hours allowed to claim – only doctors are allowed to claim up to 200 additional duty hours per month. Nurses may only claim for a maximum of 140 additional hours. ADHA likely to have contributed to more public sector employees and an increase in nurse training programmes. "Salary increases were high enough to diminish or even reverse the movement of public sector staff into other sectors within Ghana". In some cases, ADHA has been used by health staff to pay for air fares and moving costs to take jobs overseas. Doubts expressed about the effectiveness of the ADHA.	Perry S. *Preliminary retention strategy review: Ghana (Unpublished)*. Chapel Hill, NC, The Capacity Project, 2006.
Financial incentives	Ghana	Deprived area incentive allowance (DAIA)	Physicians, nurses, pharmacists, laboratory and X-ray technicians	The DAIA began in 1999 to target retention of health professionals working in the 55 targeted (mostly rural) districts. Health workers receive an additional allowance equivalent to 20-35% of their basic salary paid monthly as DAIA. Those districts that extended the DAIA to all cadres reduced the percentage levels of the allowance, doing so to appease calls for "fairness".	The study design was based on informal interviews with district directors to gain their perceptions. There was also observational analysis conducted in central and greater Accra region during field visits and the collection of qualitative data from district directors and health-care providers (total funds received, number of staff benefiting, criteria of DAIA).	Selection of deprived districts according to: a) paucity of critical staff; b) lack of amenities such as good roads, electricity, portable water; c) lack of basic social facilities such as good schools; and d) Growth and Poverty Reduction Strategy indicators. Total number of beneficiary staff in scheme: 2864. Problems with funding: by March 2005, the DAIA had only been paid for June, July, August and September 2004 (no funding available in 2005) and significant delays in release of funds. Shares the concerns of some districts that "funds should be released quarterly instead of monthly. Cumbersome procedure in the release of cheques through region to district. Prompt release of funds". Some eligible staff did not benefit in some districts. Problems with management were also highlighted – district directors were not aware of the selection criteria used by the Ministry of Health. Directors in non-deprived districts that were adjacent to deprived district did not understand why one district was selected but another was not.	Antwi J. Deprived area incentive scheme [presentation]. (ECSA workforce observatory meeting, Arusha, United Republic of Tanzania, 26-29 September 2006) Commonwealth Regional Health Community for East, Central and Southern Africa (ECSA) (http://www.hrhresourcecenter.org/node/993, accessed 25 March 2010). Boni P. Monitoring and evaluating human resources for health incentive reforms in Ghana [presentation]. Accra, Ministry of Health, 2005 (www.moh-ghana.org/health_summit05/presentations/DeprivedAreaPresentation%20byMr%20Prince%20Boni.ppt, accessed 25 March 2010).

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Financial incentives	New Zealand	Rural ranking scale (RRS)	Physicians	The RRS was introduced in 1999 to define "rural" GPs entitled to claim a rural bonus payment. Only GPs scoring 35 points or greater (maximum 100 points) were considered "rural" and entitled to apply for a rural bonus payment.	This study design was largely based on anonymous postal questionnaires, followed with data analysis and a small number of semi-structured interviews.	Although an increase in salary was appreciated, several problems remain, e.g. arguments that the judgment of "rural" should be broadened, and inequities and discrepancies between full-time and part-time GP benefits. Many GPs feel they have been unfairly categorized and some have been financially disadvantaged by the system. Positive aspects identified as interesting jobs and continuing education initiatives; negative aspects identified as excessive workload, administration, on-call duty and lack of locum cover. Despite the RRS, of the 59 South Island rural localities, 38 still had less than 3 GPs and of the 83 North Island localities, 35 had less than 3 doctors (identified as a critical number for the stress of on-call).	Janes R, London M. Rural general practitioners in New Zealand: November 1999 Census. *New Zealand Family Physician*, 2001, 28:244–249. Janes R, Dowell A. New Zealand rural general practitioners 1999 survey – Part 3: rural general practitioners speak out. *New Zealand Medical Journal,* 2004, 117(1191):1–9.
Financial incentives	Niger	Financial package for doctors accepting to work outside the capital city	Physicians, pharmacists and dentists	In April 2006, the Government of the Niger implemented a financial package for doctors accepting to work outside the capital. This study attempts to evaluate the impact of this policy.	Baseline data was collected in August 2005, through a direct census. For follow-up purposes, the same census was performed in June 2008. This time, the survey was complemented with a discrete choice experiment. Out of 292 doctors in the Niger, a sample of 100 was produced. Each of the surveyed doctors was asked to choose between one of two (virtual) packages for settling in a rural area by answering a series of 19 questions. Focus groups were also held with representatives of partners in the country, along with interviews with key stakeholders.	Between 2005 and 2008, the proportion of doctors working in the capital city remained roughly the same: 35%. Why the policy has not had the desired impact of improving the percentage could be explained in the results of a logistic regression, which found that the second parameter within each virtual package (probability of post-specialization) was the most powerful factor for explaining the probability of settling in a rural area. The number of doctors in activity outside Niamey rose from 93 in 2005 to 134 in 2008, or 44% increase. The number of pharmacists and dentists follows the same trend with respective growth rates of 46% and 42%.The model showed that to achieve a 60% probability for settling in rural area (i.e. this probability level would allow to correct the maldistribution throughout the country), doctors would ask either for a 55% probability of getting a post-specialization or a financial incentive each month (approximately one third of their salary). The comparison between the levels of motivation of doctors, pharmacists and dentists based on surveys of 2005 and 2008 shows that the situation improved in 2008 compared with 2005. The proportion of doctors, pharmacists and dentists moderately or highly motivated increased from 79% in 2005 to 88% in 2008. Although 89% of respondents reported that they benefit from the 2006 decree and allowances that followed, 62% reported that certain elements of the financial incentive scheme were not successfully carried out.	*Impact des mesures d'incitation financière accordées aux médecins, pharmaciens et chirurgiens dentistes [Impact of financial incentive measures for doctors, pharmacists and dentists].* Niamey, Ministère de la Santé Publique, 2008.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Financial incentives	South Africa	Rural allowance (RA)	Physicians	The RA was implemented in March 2004 (although retroactive to July 2003) and benefits the majority of health professionals in designated rural clinics. The areas included were identified by the integrated sustainable rural development strategy and the public service bargaining chamber. At present, it remains a purely financial incentive.	The study design was based on a longitudinal cohort study design used before and after the introduction of the new allowance. Two rounds of data collection were undertaken in the same institutions: the first in November 2003 – before the new allowance was introduced – and the second in May 2004, two months after it was implemented. Questionnaires were sent to all health professionals working in the sample institutions. The team also conducted follow-up surveys.	The majority of respondents to the second round of sampling (51%) stated that the new RA influenced them favourably towards working in a rural area in South Africa in the future. After implementation of the new allowance, the data suggest that between 28% and 35% of rural health professionals, largely professional nurses, have changed their short-term career plans because of the new rural allowance. Experienced respondents (in service for more than five years) perceived the rural allowance as more important than career development opportunities whereas the younger (those doing their community service or been in service for five years or less) reported the opposite. In the questionnaire responses, "Most respondents stated that ZAR 50 000 per annum would influence them, the majority of professional nurses said that they would change their plans only if the allowance was ZAR 100 000 per annum or more." However, many respondents answered that financial considerations are only one of a number of important factors that would influence their willingness to stay in a rural location.	Reid S. Monitoring the effect of the new rural allowance for health professionals [Research project report]. Durban, Health Systems Trust, 2004 (http://healthlink.org.za/uploads/files/rural_allowance.pdf, accessed 29 March 2010).
Financial incentives	Uganda	An example of using different financing mechanisms to develop financial incentives for health workers.	Health workers (non-specified)	A user-fee system was introduced in Kabarole District as a staff incentive measure and this cost-sharing initiative was driven by the communities, with the fees ratified at public meetings.	A sample of dispensaries and health centres were selected (urban, semi-urban and rural). 11 government facilities were finally included and quantitative data were gathered from each facility through clinical record books, etc. Observational research was also conducted before and after cost-sharing began and surveys were conducted with health workers at all facilities.	There was an increase in patient utilization in rural areas of low socioeconomic status (whereas there was a decreased utilization rate in areas classified as urban). The incentive payments were substantial – ranging from 50% to 150% of the salaries. Most of the health workers (90%) reported that they had become more motivated as a consequence of receiving regular incentive payments from the cost-sharing fund. Health workers reported that they were spending more time at work than previously and felt that the quality of service delivery they offered to their patients had improved. The results suggest that the most important factors for successful cost-sharing in a developing country are: first, a community-based, bottom-up approach to the implementation of cost recovery schemes (not a government-regulated, top-down approach); second, local control of the funds collected as user fees; third, local use of the revenues generated, e.g. for staff incentive payments and the purchase of drugs and supplies. The message that cost sharing may increase the utilization of health services under special circumstances is important. Further research is needed in order to define these circumstances more precisely and explore the differences between rural and urban situations.	Kipp W et al. User fees, health staff incentives, and service utilization in Kabarole District, Uganda. *Bulletin of the World Health Organization,* 2001, 79(11):1032–1037.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Support	Australia	Dr Doc Programme	Physicians	The Dr Doc programme, launched in South Australia in 2006, is focused on maintaining the health and well-being of rural doctors. The programme has set up various support mechanisms such as telephone consultations, crisis support, linking rural GPs to provide health treatment for rural GPs and their families as well as country practice retreats to allow rural GPs some rest and relaxation.	The study design used questionnaires for a large sample of GPs, a before-and-after cohort study to rate improvements in satisfaction, a review of documents and reports, and consultations with key stakeholders.	Reduction in the number of GPs wanting to leave rural practice in the short- to mid-term (30% to 25%); many indicated this was due to the improved networking and increased contact with other GPs following Dr Doc. Doctors have reported increased contact and interconnectedness with other GPs and an increase in morale through more opportunities to discuss professional and personal issues with other GPs. Overall, it appears there has been a "reduction in rural distress" – fewer GPs feeling personally isolated or unsupported in rural areas. Utilization of rural retreats and visiting health check-ups. 66.7% of respondents reported that the emergency support line had helped "very much so" and 75% said that the rural retreats had helped them "very much so".	Gardiner M et al. The role of psychological wellbeing in retaining rural general practitioners. *Australian Journal of Rural Health,* 2005, 13:149–155.
Support	Canada	Telehealth provision for rural and remote practices – outreach services	Physicians	This study sought to investigate whether telemedicine has positive outcomes for health workers.	This qualitative study was based on telephone interviews conducted with 12 telehealth projects in Canada, one from each province or territory, as well as a review of available literature on telemedicine.	The results of the interviews suggest physicians feel that telemedicine leads to decreased isolation, a more appropriate use of health resources, reduced number of transfers and hospitalizations, and will likely help recruitment and retention.	Watanabe M, Jennett P, Watson M. The effect of information technology on the physician workforce and health care in isolated communities: the Canadian picture. *Journal of Telemedicine and Telecare,* 1999, 5(Suppl.2):11–19.
Support	Canada	Telehealth provision for rural and remote practices – outreach services	Physicians and health practice managers	Telehealth projects and pilots became increasingly popular in rural areas in Canada throughout the 1990s and in more recent years. They were set up to try and combat the decreasing numbers of physicians being attracted to and staying in rural practices. Telehealth potentially impacts on individual, organizational, educational and professional factors for those in rural locations.	These studies were based on a Delphi study with 12 experts (essential expert opinions), semi-structured interviews with physicians and managers, qualitative iterative strategy for data analysis and field study in four regions of Quebec to explore perceptions regarding impact of telehealth through focus group discussions.	Telehealth was perceived as a powerful tool to improve health services (benefits of access to specialized services). Benefit of having access to a second opinion as well as improved communication and knowledge development. However, physicians in particular wished to stress through the interviews and discussions that telehealth could never replace on-site physicians. 43 respondents had used telehealth and experienced its benefits, 17 had never used the telehealth services. Reported increase in satisfaction due to improved communications, interconnectedness, etc.; most respondents highlighted the positive possibilities for decreased workloads, professional support and knowledge updates.	Gagnon MP et al. Exploring the effects of telehealth on medical human resources supply: a qualitative case study in remote regions. *BMC Health Services Research,* 2006, 7(6):1–9. Gagnon MP et al. Implementing telehealth to support medical practice in rural/remote regions: what are the conditions for success? *Implementation Science*, 2007, 1(18):1–8. Duplantie J et al. Telehealth and the recruitment and retention of physicians in rural and remote regions: a delphi study. *Canadian Journal of Rural Medicine*, 2007, 12(1):30–36.
Support	Spain	Telehealth – internet based community	Physicians	UniNet launched a pilot project in a rural health clinic in Spain in 2001. This project provided every doctor at the clinic with access to Internet, communications, a network of doctors, links to specialists in a larger urban hospital and the potential for on-line consultations.	The study design included an interventional study with a control group of rural family doctors, a before-and-after study with a control group to evaluate the intervention after 12 months, and the inclusion of expert opinions and other relevant studies.	Rates of consultation visits to specialists for patients and the number of hospital admissions decreased once this programme was initiated in the rural health clinic. There was a 4.6% reduction in consultation visits to specialists for patients for nephrology, a 19.36% reduction in all medical specialties and a 13.89% reduction in global consultations. Feedback suggests that the Internet and communications removed some of the isolation barriers. Physicians also indicated that regardless of the importance of the information needed, busy clinicians will use the service only if the computer connections and interfaces are convenient and easy to use.	Como del Corral MJ et al. Utility of a thematic network in primary health care: a controlled interventional study in a rural area. *Human Resources for Health,* 2005, 3(4):1–7.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Bundled intervention	Australia	Psychiatrist recruitment and retention scheme, Latrobe Hospital	Psychiatrists	Implemented by Latrobe Regional Hospital after they reached an employment crisis in 1994 with only one psychiatrist left. The bundled strategy approach encompassed a strong orientation programme to provide new rural psychiatrists assistance with housing, schooling options and help getting established in the community. A sectorized medical staff structure was implemented – including the support of medical officers and doctors for psychiatrists – and less travel requirements. Also a concerted effort was made to raise the profile and credibility of psychiatry. NOTE: Targeted primarily at international medical graduates	The study was based on data collection from employment records, individual interviews with psychiatrists, an observational study and results from an internal review.	Between 1994 and 2006 the number of full-time psychiatrists employed at Latrobe increased from one to 11. Retention rates (judged as length of service in Latrobe) of psychiatrists improved from an average of 18 months in 1994 to an average of four years in 2006 and overall there was a positive response to these retention strategies from feedback gathered. The Southern Region Training Committee Psychiatry Registrar Programme also had a positive impact. The programme provides two full-time registrars with four, three-month, compulsory rural rotations per year. They provide vital support for the psychiatric staff and were well received.	Wilks CM, Oakley Browne M, Jenner BL. Attracting psychiatrists to a rural area –10 years on. *Rural and Remote Health*, 2008, 8(1):824.
Bundled intervention	Canada	Nova Scotia (NS) rural retention package	Physicians	These strategies began appearing in 1989 after the NS Royal Commission on Health Care recommended that the Government make concrete efforts to improve the geographical distribution of physicians. The strategies include adequate training and exposure to rural medicine, residency programmes in rural areas, compulsory 12-week rotation in rural practice, a locum service providing physicians with time for vacation and continuing education, and a pilot telemedicine project in three rural communities in rural NS. Additionally, NS provides financial incentives (a USD 50 000 rural salary bonus and moving expenses).	The study design was based on a survey of rural physicians across NS and a relevant document review.	Concluded that the dissatisfaction with working hours largely due to demanding on-call requirements in rural areas. Over 40% were on call at least one third of their time. Lack of time off and working hours were the most popular reasons for dissatisfaction, followed by earnings and professional freedom. 56% said the addition of communication technologies would aid them in conducting their practices. "Close to 90% cited enhanced locum replacements as very or extremely important. Over 80% cited extra payment for rural emergency room on-call shifts as very or extremely important." Only five out of 27 physicians declared they intended to stay in rural practice for the next five years.	Nestman NA. *The retention of physicians in rural areas: The case of Nova Scotia.* Kingston, Ontario, Industrial Relations Centre, Queen's University, 1998.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Bundled intervention Financial incentives, management, professional and personal support	Lesotho	Bundled retention strategy	Physicians	Lesotho has a scarce skills policy that uses both financial and non-financial incentives. This is outlined in the Human Resources Development and Strategic Plan 2005–2025. Some measures were already in place (such as continuing professional education and better promotion prospects for those health workers accepting remote postings), but the plan laid out significant increases in both financial and non-financial terms. Monetary incentives were expanded to other health workers (e.g. the "mountain allowance" was extended to other remote highlands and on-call allowances offered to other health professionals rather than limited to doctors). Proposals to improve workplace infrastructure, communications facilities (particularly for more remote facilities), staff housing, staff transport, etc. were included, as were significant proposals to improve human resources management, including improved career management and streamlined human resources policies.	These strategies are all proposed in the Human Resources Development and Strategic Plan 2005–2025. No reference is made within the plan as to how these strategies were formulated or whether they were proposed following consultations, a factor analysis or comprehensive health workforce review.		Dambisya M. *A review of non-financial incentives for health worker retention in east and southern Africa.* Harare, Regional Network for Equity in Health in Southern Africa (EQUINET), 2007 (Discussion Paper No. 44) (http://www.equinetafrica.org/bibl/docs/DIS44HRdambisya.pdf, accessed 24 March 2010).
Bundled intervention	Madagascar	Santé Sud project to settle and support general practitioners in isolated areas in Madagascar	Physicians	Activities began in November 2003 for a three-year project to set up 42 community GPs in 38 isolated zones. The project aimed to assist in the installation of rural community GPs in areas where there was no pre-existing health structure and to support these doctors over time in order to ensure their provision of good quality community medical care. Financial aid was made available when choosing the place of installation, for the facilities (medical practice and living accommodation) and for the medical equipment. GPs were offered initial training, supervision and continuous professional development specific to medical practice in isolated rural areas, as well as technical and operational support during installation.	This was a mid-term evaluation and aimed to establish its current status and progress. Evaluation commenced in October 2006. Interviews were undertaken at international, national, regional and local levels with main stakeholders, partners and actors. Twelve sites in four regions of the province of Antananarivo were visited, including both the first and most recent installations for observational analysis.	The survey of slightly less than one third of the physicians has demonstrated that they provide, in the view of their communities, high quality medical services. They provide a service that is comparable to physicians in a government-run basic health centre. The income of the physicians who have set up practice, which is on average higher than that of physicians in public service, allows them to be independent. However, the villagers' income is not stable or dependable throughout the year. The cost of helping a physician to set up practice is €12 000. The cost of the infrastructure, material and equipment needed for the Santé Sud physicians to practise medicine is considerably lower than for a physician in a basic health centre. Reasons for choosing position: rural preference /background, liberal practice opportunity, stability, support available. About half the GPs were stable in six months. Self-reported satisfaction with equipment (70% satisfied), facilities (70% without drinking water), quality and availability of medicines (about 80% satisfied), pre-training (100% positive), professional development (100% positive), supervision (100% positive). Number of visits to clinic is dependent on multiple seasonal and epidemiological factors and periods/areas of increased poverty; also on patient satisfaction. Medical charges (average profit is 25%). Generally, both doctors and populations are satisfied with level of integration into the community. Most rural doctors in the project have an “excellent” relationship with neighbouring centres.	Ranjalahy-Rasolofomanana J et al. *Evaluation a mi-parcours du projet Santé Sud Madagascar [Mid-point evaluation of the Santé Sud project in Madagascar].* Antananarivo, Institut National de Santé Publique et Communautaire, 2008.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Bundled intervention	Mali	Medicalization of rural areas (bundled, plus contracting)	Physicians	After the administrative reform of 1999–2002 which introduced decentralization, community health centres (CSCOM) were revived or opened in rural areas. As early as in 1989, the nongovernmental organization Santé Sud lent its support to this process. To varying degrees, the bundled strategies combined: support in finding and establishing posts; negotiating contracts, and conditions; provision of installation packages (mode of transport, accommodation, medical kit, solar panel, etc.); opportunity for professional development and specialization; social and professional peer-support.	The study design included an analysis of the documentation, a survey using a questionnaire among 120 physicians practising in rural areas, interviews with national decision-makers, institutional partners and operators involved in the implementation of the programme. There was also a cost analysis of the measures adopted and close observational studies in the four regions in which the physicians practise.	The strategies introduced succeeded in attracting physicians to rural areas (more than 100 installed in 10 years), although the precarious nature of the job and the working conditions act as a brake on any long-term career prospects. Those supported by the Association des médecins de campagne, Santé Sud and the Malian government stay on average four years in rural areas, in contrast to those who were not supported in the negotiations with their employers and who did not receive an installation package. The most satisfying bundled approach combines support in finding a post and negotiating a contract, provision of an "installation package", means of transport and accommodation, regular salary comparable to that of a public post, professional development and receiving 25% of the medical payments. A fairly satisfying bundled approach combines the availability of accommodation (incomplete installation strategy), regular salary payment (but less than that of a public post) and receiving a fixed percentage of the medical payments. The least satisfying bundled approach is limited to available accommodation and an irregularly paid fixed amount salary. The improved access to health care for the population is tangible, albeit hard to document. The feasibility and sustainability of the strategies depends on the existing process being institutionalized and on the provision of support mechanisms for the strategies in place. Various financial scenarios for extending, sustaining and institutionalizing the programme are proposed.	Codjia L, Jabot F & Dubois H. *Evaluation du programme d'appui à la médicalisation des aires de santé rurales au Mali [An evaluation of the support programme for the medicalization of rural health areas in Mali].* Geneva, World Health Organization, 2010 (Accroître l'accès aux personnels de santé dans les zones rurales ou reculées – étde de cas No. 2).

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Bundled intervention	Thailand	Bundled strategy including elements of education, compulsory service and financial incentives	Physicians	Thailand has been using various strategies to try to solve inequitable distribution of doctors. These include rural recruitment, training and hometown placement, increasing the supply of health workers, scholarships, compulsory public service and various financial incentives. Compulsory three-year public service contracts for doctors began in Thailand in the 1970s and produced immediate results as more doctors were distributed to rural areas. However, despite this bonding scheme, in later years graduates would break this contract in favour of private practice.	These studies were based on semi-structured telephone interviews, using a questionnaire, an extensive literature review, extracting data from previous studies and a retrospective cohort study. A logistical regression model was used for data analysis.	Compulsory public service contracts contributed greatly to the success of a more equitable distribution of doctors to the rural district hospitals in the late 1970s and the 1980s. The number of doctors in the public sector increased more than two-fold in 10 years. However, since then there has been a considerable brain drain, with doctors paying the requires fines to break their contracts and then choosing to work in the private sector (mainly urban practices). Internal brain drain peaked in June 1997 when 22% of new medical graduates resigned from the Ministry of Public Health. 41.5% of those interviewed cited, "Don't want to work in hardship area" and 41.8% cited, "Don't know the real situation of the area" as perceived reasons for their friends resigning. Compulsory transfer from one province to another (mismanagement of human resources) was the primary cause stated for many resignations. Other factors included family reasons and desire for further training. "In Thailand, after 28 years of compulsory contract with medical students, 49.5% of rural district hospital doctors are new graduates." The fine for breach of contract has not kept up with inflation. The attempt to increase the fine to correct for inflation was strongly opposed by the medical schools. 74.6% of the non-resigned doctors believed that their friends resigned due to the compulsory transfer to other provinces element. The Collaborative Project to Increase Production of Rural Doctors (CPIRD) was launched in 1995. In 1990 24.54% and in 1993 23.37% of medical students were from a rural background. In 1996 this had increased to 25.09% and in 2001 it was as high as 31.45%, indicating that the establishment of more regional medical schools is having positive impact. A new medical graduate working in a rural district may receive from USD 825 (in regular districts) to USD 1379 per month (in the remotest districts). But this is still lower than the salary of a new graduate in private practice in an urban area (at least USD 1500 per month). The special rural allowance has also reportedly caused many inequities. "Some district hospitals only 10 km to 20 km apart on paved roads experience a 5-fold to 10-fold allowance differential."	Wibulpolprasert S, Pengpaibon P. Integrated strategies to tackle the inequitable distribution of doctors in Thailand: four decades of experience. *Human Resources for Health,* 2003, 1:12. Wongwatcharapaiboon P, Sirikanokwilai N, Pengpaiboon P. The 1997 massive resignation of contracted new medical graduates from the Thai Ministry of Health: What reasons behind? *Human Resources for Health Development Journal,* 1999, 3(2):147–156.
Bundled intervention	Zambia	Bundled strategy – health workers retention scheme	Physicians	In return for signing a contract to work in a designated rural area for three consecutive years, each medical cadre earns a hardship allowance. Depending on the cadre, they may also receive financial aid for housing rehabilitation, vehicle loan, and some facility incentives, such as provision of medical equipment and provision of solar panels.	The study design included semi-structured interviews, observations of health workers during field research in several provinces, relevant document review, use of MOH statistical data and expert opinions as well as a participant feedback survey.	68 doctors joined the scheme. "During the mid-term review 20 doctors on the scheme were interviewed. The majority of the doctors interviewed said that without the incentives they would not have come to the district where they were working. They would have tried to find more attractive postings (A or B districts), or would have left government service." In the satisfaction analysis of health workers (through the interviews and feedback survey), education facilities for children, workload, social amenities and secondary income opportunities were all rated as “not at all satisfactory” by participants. However, overall rates showed that participants were "somewhat satisfied" with retention allowances and benefits.	Koot J, Martineau T. *Zambian health workers retention scheme (ZHWRS) 2003-2004: Mid-term review.* 2005 (http://www.hrhresourcecenter.org/hosted_docs/Zambian_Health_Workers_Retention_Scheme.pdf , accessed 24 March 2010).

Studies relating to staff motivation, satisfaction and the decision to go to, stay in or leave remote and rural areas

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Factors	South Africa	Career choices of medical graduates of rural origin	Physician graduates	Study to investigate the career choices of medical graduates of rural origin in South Africa and to determine what proportion are currently practising in a rural area.	This is a retrospective descriptive study. The postal questionnaire was sent out to 138 rural-origin and 140 urban-origin graduates in December 2001.	38.4% of the rural-origin graduates are currently practising in rural areas, compared with 12.4% of urban-origin graduates practising in rural areas (Sample A, graduated 1991-1992). Of the rural origin graduates, 41.6% are in rural practice, compared with 5.08% of urban-origin graduates (Sample B, graduated 1994-1996). In response to the question on rural exposure during undergraduate training, only 34.8% of those in rural practice felt that it influenced their choice of where to practise, while 27.1% of those in urban practice felt that it influenced them.	De Vries E, Reid S. Do South African medical students of rural origin return to rural practice? *South African Medical Journal,* 2003, 93(10).
Factors	South Africa	What interventions do South African doctors think will retain them in rural areas.	Physicians	This study aimed to identify which interventions doctors in the rural Limpopo province of South Africa believe would retain them.	Descriptive qualitative study using a semi-structured questionnaire. Ten doctors from rural hospitals were randomly selected.	"Almost all doctors participating in this study stated that improving their salary was one of the three most important factors in retaining doctors in rural practice and almost half mentioned it as the most important factor." Doctors recommended increasing rural allowances, improving rural hospital accommodation, ensuring career progression, providing CME, increasing support by specialist consultants, improving the physical hospital infrastructure and rural referral systems, and strengthening management, among many other things.	Kotzee T, Couper ID. What interventions do South African qualified doctors think will retain them in rural hospitals of the Limpopo province of South Africa? *Rural and Remote Health*, 2006, 6:581.
Factors	Australia	Factors that influence the career decisions of rural and remote students	Students	Since 1994, a state-wide health careers workshop programme has been operating in Queensland to provide non-metropolitan secondary school students with information about health careers. As part of an evaluation of the programme this study aimed to determine what factors affect the decisions of these rural and remote area students.	94 of 277 past participants of the workshops responded to a postal questionnaire and were invited to participate in a semi-structured telephone interview to collect further information related to the course and career choices. Final interviews were held with 70 participants.	Self-interest was rated as the highest contributory factor for deciding upon future career or postgraduate options. Attendance at a health careers workshop was rated by 49% of the interviewees as category 4 or 5 (on a scale of 1-5, 5 being most important). Only 8.5% considered the workshops played no influence.	Buikstra E, Eley RM, Hindmarsh N. Informing rural and remote students about careers in health: Factors influencing career decisions. *Australian Journal of Rural Health,* 2007, 15:289–295.
Factors	Nepal	Factors that influence retention of doctors in rural areas	Physicians	This study sought to explore the key factors and issues that influence doctor retention in rural areas of Nepal. There is a significant rural-to-urban disparity in Nepal.	This was a qualitative study using triangulation of data from two questionnaires, semi-structured interviews and focus group discussions. Data from a small community survey from 13 rural districts were also included. 87 physicians and 11 individuals involved in policy development and rural health care participated.	The key issues identified by this study as critical to the retention of GPs in rural areas of Nepal were: career/promotion prospects, status/recognition, financial incentives, working conditions, education for children, continuing medical education, political stability and security. The strongest theme was that of career development. A multifaceted, holistic response is necessary. At the community level, a career structure and financial remuneration to adequately set up hospitals, functional teams, family support, continuing professional development and a secure working environment – each area must be addressed for the whole to function.	Butterworth K, Hayes B, Neupane B. Retention of general practitioners in rural Nepal: A qualitative study. *Australian Journal of Rural Health,* 2008, 16:201–206.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Factors	Canada	Job satisfaction and turn-over intention	Nurses	Health system reform experienced in Canada since the 1990s profoundly affected health-care workplaces and workers' attitudes. This study examines the associations between deteriorated external work environment (decisions being made outside the hospital, limited resources and budget cuts), heavy workload and nurses' job satisfaction and turn-over intention.	The data used for this study were collected in a larger project that used a mixed research methodology design combining both qualitative and quantitative methods. A questionnaire was developed and pilot tested before being used. The study uses a purposive sample of nurses in three hospitals in southern Ontario. All nurses at these institutions were included in the survey and a total of 1396 nurses responded.	External work environment and increased workload were found to be significantly and negatively associated with job satisfaction for all nurses. For turnover intention, external work environment was a weak but negatively significant factor in nurses' intention to leave, job satisfaction is significantly and negatively associated, and workload is significantly and positively associated with nurses' turnover intention. Interestingly, the importance of each of these varied among full-time, part-time and casual nurses (e.g. heavy workload was most important for full-time nurses' intention to leave, whereas neither the deteriorated external work environment nor the heavy workload is a factor associated with the intention to leave or stay for casual workers.)	Zeytinoglu IU et al. Deteriorated external work environment, heavy workload and nurses' job satisfaction and turnover intention. *Canadian public policy – Analyse de politiques,* 2007, 33:31–47.
Factors	Jordan	Job satisfaction and retention	Nurses	The purpose of this research was to describe Jordanian nurses' job satisfaction and retention. Specific questions were: 1) What are the differences in demographics, job satisfaction, and retention of nurses in public and private hospitals? 2) What factors influence job satisfaction and retention of Jordanian nurses? and 3) What is the relationship between nurse job satisfaction and retention?	A descriptive design using surveys guided this study through a convenience sample of 438 nurses (124 from public hospitals and 314 from private). Data were then analysed using descriptive and inferential statistics. A five-point Likert scale was used to rate nurse job satisfaction. This study was conducted in three public and two private hospitals, chosen non-randomly from the total number of hospitals in Jordan.	In assessing job satisfaction and retention, the sample mean for total nurse job satisfaction was 2.98 "moderately satisfied". Nurses in private hospitals were more satisfied and reported higher intentions to retain their jobs. Nurse education was shown to have a positive impact both on satisfaction and retention, as well as age and experience. Marital status (being single), shift worked (rotating or day), years of experience in nursing, current area of work and age are predictive factors of satisfaction. For example, those working evenings and nights reported lower satisfaction and intention to stay. Salaries were noted as a key source of dissatisfaction.	Mrayyan MT. Nurse job satisfaction and retention: comparing public to private hospitals in Jordan. *Journal of Nursing Management,* 2005, 13:40–50.
Factors	Malawi	Factors related to employment preferences	Nurses	The aim of this discrete choice experiment was to understand the employment preferences of Malawian public sector registered nurses and to ascertain whether salary increases significantly affect how nurses regard their employment.	A discrete choice experiment was used to assess the significance of six job attributes on nurses' preferences over pairs of job descriptions: net monthly pay, provision of government housing, opportunities to upgrade their qualifications, typical workload, availability of resources and place of work. A multivariate model was used to estimate the extent to which nurses were willing to trade between their monetary benefits, non-monetary benefits and working conditions, and to determine the relative importance of the job attributes.	Most nurses were willing to trade among attributes, and very few appeared to have preferences that were dominated by a single job attribute. All attributes had a statistically significant influence on nurses' preferences, and further analysis showed the rate at which they were willing to forego pay increases for other improvements in their employment conditions. Opportunities to upgrade professional qualifications, government housing and the increases in net monthly pay had the greatest impact on nurses' employment choices.	Mangham LJ, Hanson K. Employment preferences of public sector nurses in Malawi: results from a discrete choice experiment. *Health Economics and Financing Programs*, 2008, 13(12):1433-1441.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Factors	Malawi and Eastern Cape Province, South Africa	Factors that influence whether health workers want to stay in or leave rural areas	All health workers	The aim of this study was to identify the most suitable groups of health workers for the provision of community health services in remote rural areas.	The study utilized a brief longitudinal study collecting data on leavers for a period of six months. Key informant interviews were conducted to validate quantitative data collected and data from surveys, observations and management data review. Samples were selected from various facilities and a reasonable gender-balance was aimed for.	In Malawi, the following points were raised: ▪ adequate job satisfaction, but high workloads; ▪ lack of differences in levels of academic qualifications is a cause of frustration; ▪ dissatisfaction with housing and transport; ▪ almost universal unhappiness with the level of salary; ▪ inadequate opportunities for career development and promotion. In South Africa, the following points were raised: ▪ most staff had adequate job satisfaction; ▪ almost all unhappy with level of salary, nurses were unhappy with their rural allowance, despite the recent increase; ▪ majority of all cadres felt the housing was unsatisfactory; ▪ lack of communication networks, transport and lack of security were among the frequently mentioned problems.	Martineau T et al. *Factors affecting retention of different groups of rural health workers in Malawi and Eastern Cape Province, South Africa.* Geneva, Alliance for Health Policy and Systems Research, World Health Organization, 2006.
Factors	Namibia	Factors that influence whether health workers stay in or leave rural areas	All health workers	This study describes why health professionals are moving (push factors) and why they are staying on (retention factors) with regard to working conditions in the public and private health facilities in the Khomas region. The contextual factors, such as the health sector reform that took place after independence in 1990, and how these affected and impacted working conditions are also described.	Data were collected through nine focus group discussions and 10 individual in-depth interviews following a pilot study to test the questions. Participation was voluntary and consent was given.	Reasons for leaving raised by health professionals included: personal financial burdens (forcing them to return), insecurity regarding pension pay-outs, better salaries in the private sector (especially for doctors), limited career movement opportunities, lack of recognition for skills / career development, no positive staff reinforcement / motivation / reward in the public sector, lack of in-service education and work stress. Retention factors included: competitive salaries, medical aid and housing subsidies for public service employees, patriotism, job security and fear of the unknown. Social workers and health inspectors also believed there were more career development opportunities for them in the public sector than the private.	Iipinge SN et al. *Perceptions of health workers about conditions of service: A Namibian case study.* Harare, Regional Network for Equity in Health in Southern Africa (EQUINET), 2006 (Discussion Paper No. 35) (http://www.equinetafrica.org/bibl/docs/DIS35HRiipinge.pdf, accessed 17 March 2010).
Factors	Swaziland	Assessing the role of incentives and their relevance to current factors driving exit and retention	All health workers	This country study in Swaziland sought to map and assess incentives for retaining health workers, particularly non-financial incentives. Specifically, it sought to identify existing policies and measures for incentives for retention of health workers, their relevance to current factors driving exit and retention, and to propose inputs for guidelines for introducing and managing incentives for health worker retention to maximize their positive impact.	This study was based on a desk review of available literature and a field study using both qualitative and quantitative research methods. 19 documents were reviewed and analysed. A survey of 160 health workers was implemented and focus group discussions were carried out with health workers and supervisors as well as semi-structured interviews with senior managers.	Workers' attitudes towards their institution and how much support they received were the two main variables influencing decisions to leave. Six factors significantly influenced decisions by health professionals to either change institution or to actively look for a different institution in the next year. Factors positively associated with retention were: job satisfaction, equality/treatment by employer, job discretion and helping others. Factors negatively associated with retention were: employee's attitude towards their institution and support. A clear policy on the terms and conditions of service for health professionals needs to be formulated and all the career paths and prospects for professional growth for the various health professions need to be spelt out.	Masango S, Gathu K, Sibandze S. *Retention strategies for Swaziland's health sector workforce: Assessing the role of non-financial incentives.* Harare, Regional Network for Equity in Health in Southern Africa (EQUINET), 2006 (Discussion Paper No. 35) (http://www.equinetafrica.org/bibl/docs/DIS68masango.pdf, accessed 24 March 2010).

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Factors	Uganda	Satisfaction of health workers	All health workers	This report summarizes the results of a study of health worker satisfaction, working conditions and intent to continue working in the health sector in Uganda.	Districts were stratified to ensure that "hard to reach" areas were selected and selection was weighted by population. Questionnaires were administered to three groups: those currently in health-related positions, those who had voluntarily left their position during the previous year, and two groups of managers. Focus groups were also conducted in each facility. 641 surveys were collected from people who had been in their jobs at least a year, 38 surveys from people who had changed jobs and 61 surveys from health system managers. There were 56 focus group discussions conducted.	Older respondents reported more job satisfaction than younger ones due to a stronger attachment to the facility and the community, as well as receiving more recognition for good work. Morale was found to be higher in the private sector. There was dissatisfaction with working and living conditions, particularly in public facilities. Only 11% thought their salary packages were fair. The importance of compensation was highest among nurses. "It is notable that respondents said that health care for dependents was even more important than salary itself, but that managers, when asked in their own survey, significantly underestimated the importance of health care benefits to employees." Regression analyses were able to evaluate the most important factors contributing to overall satisfaction: job was a good match with worker's skills and experience; satisfaction with salary; satisfaction with supervisor manageable workload; job was stimulating and fun; and job security.	Ministry of Health, Republic of Uganda. *Uganda health workforce study: Satisfaction and intent to stay among current health workers*. Chapel Hill NC, The Capacity Project/United States Department of Health and Human Services/United States Agency for International Development, 2007 (http://www.intrahealth.org/~intrahea/files/media/health-systems-and-hrh/exec_sum_retention_study_final.pdf, accessed 17 March 2010).
Factors	United Republic of Tanzania	How informal earnings might help boost motivation and retention	All health workers	There is growing evidence that informal payments for health care are fairly common in many low- and middle-income countries. Informal payments are reported to have a negative consequence on equity and quality of care; it has been suggested, however, that they may contribute to health worker motivation and retention. Given the significance of motivation and retention issues in human resources for health, a better understanding of the relationships between the two phenomena is needed. This study attempts to assess whether and in what ways informal payments occur in Kibaha, United Republic of Tanzania and whether they may impact on motivation and retention of health workers.	Nine focus group discussions were conducted in three health facilities of different levels in the health system. A total of 64 health workers participated (81% were female). Health workers were selected at random and were stratified by cadre. Prior permission to record the focus group discussions was obtained from the health workers.	In general, health workers did not seem to be satisfied with their jobs. Even though almost all participants recognized that they appreciated and liked their job, they expressed dissatisfaction because of the low salary and difficult working conditions. Clinical officers and medical attendants tended to be completely dissatisfied due to low salary, heavy workload and lack of clarity on duties. Salary was frequently reported as insufficient when compared with needs and workload (despite recent increases). Job security was identified as the most important factor, more so than the opportunities provided through informal payments. Opportunities for further education and training were considered important by certain categories, such as nurses and midwives.	Stringhini S et al. Understanding informal payments in health care: motivation of health workers in Tanzania. *Human Resources for Health,* 2009, 7:53.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Factors	United States of America	Factors that influence decisions to join, leave or stay in a specific location.	Physicians and mid-level health workers	The objective of this study was to determine why physicians and mid-level providers join, leave or stay in the Navajo Area Indian Health Service (IHS).	Questionnaires were pilot-tested and then sent out to physicians and mid-level health workers. A cross-sectional analysis of data obtained from questionnaires was conducted. A total of 221 (64%) of physicians and mid-level health workers responded.	When open-ended responses were tabulated, the most common reasons for joining the IHS were the desire to work in the south-western United States, followed by the desire to work with the underserved, schedule flexibility, loan repayment and variety in work content. These differed slightly from the reasons listed as those most influencing the decision to join as elicited from the Likert scales, which were desire to work with the poor, quality of the medical staff, job challenges, job variety and recreational opportunities. The most common reasons to leave were lack of administrative support and quality, distance from family and friends, excessive working hours and the poor local school system.	Kim C. Recruitment and retention in the Navajo area Indian health service. *Western Journal of Medicine*, 2000, 173:240–243.
Factors	Viet Nam	Motivating factors and job perception	All health workers	In Viet Nam, most public health employees (84%) currently works in rural areas, where 80% of the people live. To provide good quality health services, it is important to develop strategies influencing staff motivation for better performance. Exploratory qualitative research was carried out among health workers in two provinces in northern Viet Nam to identify entry points for developing strategies to improve staff performance in rural areas. The study aimed to determine the major motivating factors and was the first in Viet Nam to look at health workers' job perception and motivation.	An exploratory qualitative study was conducted in two provinces. Following testing of the instruments, 53 semi-structured interviews and eight group discussions were carried out. Policy-makers and health staff at the district and community level were interviewed about their perceptions on what motivates and discourages (de-motivates) health workers, and their perceptions of human resource management tools. Community members were asked about their perceptions of health workers, among other things.	Only 10 types of motivating and discouraging factors were mentioned. For commune and district health workers, recognition for the work that they do from their managers, colleagues and clients was of great importance and was ranked highest. As in many other countries, salaries and allowances are low and, not surprisingly, were mentioned as the main discouraging factor. District health workers mentioned as a third discouraging factor a lack of updated information, whereas commune health staff ranked this lower and considered lack of knowledge an important discouraging factor. Poor communication was also highlighted as a key discouraging factor among district level staff.	Dieleman MA et al. Identifying factors for job motivation of rural health workers in north Viet Nam. *Human Resources for Health,* 2003, 1(10):1–10.
Factors	Zimbabwe	Factors that influence decision to leave	All health workers	Zimbabwe is faced with the serious and ongoing challenge of continuing emigration of health professionals. The study aimed to establish the magnitude of health workforce migration and to gain an understanding of the reasons why health workers are choosing to leave. The survey of health professionals showed widespread discontent with working conditions, workloads and salaries, as well as broader economic and political conditions in the country.	Five inter-linked research instruments were developed in order to better understand the causes of the medical brain drain from Zimbabwe. Various questionnaires were administered at hospitals and the MOH, to individual health workers, during focus group discussions and to emigrant health workers. Both purposive and random sampling were used.	"54.7% cited economic factors as a reason for leaving. Economic factors cited include the desire to receive better remuneration in the intended country of destination (55%) or the desire to save money quickly (54%) for later use in the home country. Political factors cited included pessimism about the future (cited by 45%), the general mood of despondency in the country (24.2%) and the high levels of crime and violence (22.9%). Professional factors influencing potential emigration decisions included the lack of resources and facilities (42.9%), heavy workloads (39.4%) and insufficient opportunities for promotion and self-improvement (32.2%). Lastly, social factors cited included the desire to find better living conditions (47.2%) and children's safety (25.1%)."	Chikanda A. *Medical leave: The exodus of health professionals from Zimbabwe.* Kingston, Ontario, Southern African Research Centre, Queen's University, 2005.

Systematic reviews, literature reviews and multi-country studies

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Education	Australia, Canada, United States of America	Rural backgrounds	Physicians	This systematic review aimed to summarize the evidence for an association between rural background and rural practice.	A systematic review, which retrieved observational studies of a case-control or cohort design. All included urban vs. rural comparisons and reported quantitative results. A total of 12 studies were included following the systematic review.	"Rural background was associated with rural practice in 10 of the 12 studies, in which it was reported, with most odds ratios (OR) approximately 2–2.5. Rural schooling was associated with rural practice in all 5 studies that reported on it, with most OR approximately 2.0. Having a rural partner was associated with rural practice in 3 of the 4 studies reporting on it, with OR approximately 3.0. Rural undergraduate training was associated with rural practice in 4 of 5 studies, with most OR approximately 2.0. Rural postgraduate training was associated with rural practice in 1 of 2 studies, with rural doctors reporting rural training about 2.5 times more often."	Laven G, Wilkinson D. Rural doctors and rural backgrounds: How strong is the evidence? A systematic review. *Australian Journal of Rural Health,* 2003, 11:277–284.
Education	Australia, Brazil, Canada, France, Indonesia, Sri Lanka, United Kingdom, United States of America, Zambia	Continuing education meetings and workshops	Physicians, nurses, psychotherapists, pharmacists	This Cochrane systematic review aimed to assess the effects of continuing education meetings on professional practice and health-care outcomes.	Following a systematic review of databases, 32 studies were included with a total of 26 comparisons. These were judged to be of moderate or high quality, although methods were poorly reported. 30 studies were randomized controlled trials and two used non-equivalent group designs.	24 out of 32 studies reported significant improvement in professional practice (in at least one major outcome measure) of those with access to continuing education meetings. Interactive workshops can improve professional practice.	Thomson O'Brien MA et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes (Review). *The Cochrane Library,* 2005, Issue 4.
Education / Support	Australia, Canada, South Africa, United States of America	Continuing education and training	Variety of health workers: physicians, nurses, indigenous health workers, physician assistants	"This study examines the role and contribution of continuing professional development in enhancing workplace attractiveness and improving retention of primary health workers in small rural and remote communities. In particular, it examines how important education and training is to increasing workforce retention relative to other factors, the best way of providing effective education and training to rural and remote primary health care workers, and evaluates the costs and benefits associated with providing such education and training."	This is a systematic review of the material available on continuing education and training opportunities. Numerous databases were searched, along with grey literature. 21 papers were deemed relevant to the inclusion criteria. The observational studies included longitudinal studies, ethnographies, surveys, interviews, etc.	"While CPD/CPE activities are identified as important to retention, they are usually not the most important factor. Moreover, the importance attributed to CPD/CPE varies with gender, age or stage in the life-cycle, years of experience in rural practice or profession, and other professional elements such as career pathways, mentoring, adequate orientation and peer support. A clear conclusion is that a comprehensive retention 'package' is important and each element of it must be addressed."	Humphreys J et al. *Improving primary health care workforce retention in small rural and remote communities: How important is ongoing education and training?* Canberra, Australian Primary Health Care Research Institute, 2007.
Regulatory	Canada, Japan, New Zealand, South Africa, United States of America	Incentives for return of service	Physicians	This systematic review aimed to analyse the programmes results, effects and impacts of those schemes that require health workers to agree to a contract to work for a number of years in an underserved area in exchange for incentives such as scholarships, loans, or direct financial incentives.	This systematic review included 43 studies, all of which were observational studies.	18 studies assessed retention in any underserved area: 12%–90% of physicians were retained in an underserved area post-obligation. Seven studies assessed retention in the same (underserved) area: six found that participants were less likely than non-participants to remain in the same area and one study did not find a significant difference. 13 studies assessed provision of care or retention in any underserved area: 11 found that participants were more likely to (continue to) practise in any underserved area and two found the opposite. However, across the programmes reviewed, about three in 10 participants did not fulfil their commitment to work in an underserved area.	Bärnighausen T, Bloom D. Financial incentives for return of service in underserved areas: a systematic review. *BMC Health Services Research,* 2009, 9:86.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	High-income countries	Enhanced scope of practice	Nurse practitioners	This systematic review aimed to determine whether nurse practitioners could provide care at first point of contact equivalent to doctors in a primary care setting.	This systematic review included both randomized controlled trials and prospective observational studies comparing nurse practitioners and doctors providing care. 11 randomized controlled trials and 23 observational studies met the final inclusion criteria.	Patients were more satisfied with care by a nurse practitioner (standardized mean difference 0.27, 95% CI 0.07 to 0.47). No differences in health status were found. No differences were found in prescriptions, return consultations or referrals. Quality of care was in some ways better for nurse practitioner consultations. Nurse practitioners can provide care that leads to increased patient satisfaction and similar health outcomes when compared with care from a doctor.	Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *British Medical Journal,* 2002, 324:819–823.
Regulatory	Low-income countries	Use of different type of health workers – mid-level health workers	Mid-level health workers	This review aimed to support such efforts by collating what is known about experiences with mid-level cadres in low-income countries in Africa, southeast Asia and the Pacific, i.e. regions that heavily rely on them. It interrogated the existing evidence on the evaluation of different types of mid-level workers and their impact on health outcomes and identified knowledge gaps. The review focused specifically on the role of mid-level workers as independent practitioners in areas that suffer from severe shortages of professionals.	This narrative literature review took an iterative approach to finding relevant literature. About 180 articles were initially assessed and 46 eventually included in the review. Inclusion criteria were a focus on low-income countries and publication in a peer-reviewed journal, published book or formal evaluation report. Most evidence was of a descriptive nature.	Mid-level workers (MLWs) are often considered attractive because it is assumed that at a time of accelerating attrition of health professionals they are more easily retained. However, little systematic evidence has been collected to track length of stay, reasons for leaving or destinations when leaving. Only one article (Pereira et al. 2007) was found that compared retention rates of mid-level doctors and professionals. There is no reason to doubt the widely held assumption, which is supported by anecdotal evidence, that MLWs are not only much more easily attracted to areas with health worker shortages, but also retained there. However, evidence is lacking and tracking of MLWs is an urgent requirement.	Lehmann U. *Mid-level health workers: The state of the evidence on programmes, activities, costs and impact on health outcomes. A literature review.* Geneva, World Health Organization, 2008 (http://www.who.int/hrh/MLHW_review_2008.pdf , accessed 24 March 2010).
Regulatory	Australia, Bangladesh, Canada, China (Province of Taiwan), Ethiopia, India, Ireland, Mexico, New Zealand, South Africa, Thailand, United Kingdom, United Republic of Tanzania, United States of America.	Use of different type of health workers – lay health workers (LHWs)	Lay health workers	This Cochrane systematic review aimed to assess the effects of LHW interventions in primary and community health care on health care behaviours, patients' health and well-being and patients' satisfaction with care.	The systematic review retrieved 43 randomized controlled trials and studies that met its inclusion/ exclusion criteria. 15 studies were judged as high quality, the rest low.	Three studies (Barnes 1999; Johnson 1993; Krieger 2000) provide strong evidence that LHW-based promotion strategies can increase the uptake of immunization in both adults and children (RR=1.30 [95% CI 1.14 to 1.48] *P*=0.0001). There was little heterogeneity (*P*=0.95).	Lewin SA et al. Lay health workers in primary and community health care (Review). *The Cochrane Library,* 2005, Issue 4.
Regulatory	47 sub-Saharan African countries	Use of different type of health workers – non-physician clinicians (NPCs)	Non-physician clinicians	This descriptive review discussed the use of NPCs in 25 of 47 countries in sub-Saharan Africa, as well as their training, roles and their urban / rural distribution.	This is a descriptive literature review, yet the methodology is absent from the published review.	NPCs were active in 25 of the 47 sub-Saharan African countries investigated. Many NPCs were recruited from rural and poor areas, and usually trained closer to their geographical origin and eventual place of service than did those who received medical education at largely urban institutions. Therefore, their presence has been especially important for deployment of health care to rural and hard-to-serve regions. Low training costs, reduced training duration and success in rural placements suggest that NPCs could have substantial roles in the scale-up of health workforces in sub-Saharan Africa.	Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *The Lancet,* 2007, 370:2158–2163.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Regulatory	Canada, New Zealand, United States of America	Incentives for return of service in rural and underserved areas	Physicians	This systematic review aimed to evaluate the effectiveness of programmes that provide financial incentives to physicians in exchange for a rural or underserviced area return-of-service commitment.	The initial search retrieved 516 studies. The quality of the evidence was low and of limited applicability (one retrospective and one prospective cohort study, the remainder cross-sectional surveys). The 10 best quality studies were selected for inclusion in the systematic review.	Return-of-service programmes to rural and underserviced areas have achieved their primary goal of short-term recruitment, but have had less success with long-term retention. In the USA, lenient buy-out opportunities have reduced effectiveness. In the absence of a multi-dimensional approach, these programmes have had less success with respect to long-term retention. New and existing Canadian programmes should be studied prospectively to examine cost-effectiveness and incorporation of other modalities, such as medical education initiatives, differential fees, community and professional support and alternate funding models.	Sempowski IP. Effectiveness of financial incentives in exchange for rural and underserviced area return-of-service commitments: systematic review of the literature. *Canadian Journal of Rural Medicine,* 2004, 9(2):82–88.
Support	Australia, Canada, China (Hong Kong SAR), Ecuador, Kenya, Israel, Netherlands, Norway, South Africa, Uganda, United Kingdom, United Republic of Tanzania, United States of America, Zimbabwe	Specialist outreach clinics	Physicians	This systematic review aimed to undertake a descriptive overview of studies of specialist outreach clinics and to assess the effectiveness of specialist outreach clinics on access, quality, health outcomes, patient satisfaction, use of services and costs.	Of the 73 outreach interventions identified in this systematic review, only nine studies met the Cochrane Effective Practice and Organisation of Care (EPOC) inclusion criteria (randomized controlled trials, controlled before-and-after studies and interrupted time series analyses). The systematic review concluded that the overall quality of studies was significantly higher in evaluations of outreach to urban non-disadvantaged populations compared with those in rural and rural-disadvantaged areas.	The studies reported improved health outcomes in relation to specialist outreach clinics, such as more depression free days, as well as good quality of care and patient satisfaction with the quality of care. One study found that outreach reduced the cost for the consumer by 19%, and reduced the distance to the clinic. Out of the 73 studies describing outreach services, 31 related to rural populations.	Gruen RL et al. Specialist outreach clinics in primary care and rural hospital settings. *Cochrane Database of Systematic Reviews*, 2003, (4):CD003798.
Retention	Global	Recruitment and/or retention of health workers	All health workers	This Cochrane systematic review aimed to assess the effectiveness of interventions aimed at increasing the proportion of health professionals working in rural and other underserved areas.	This systematic review concluded, "There are no studies in which bias and confounding are minimized to support any of the interventions that have been implemented to address the inequitable distribution of health care professionals." A number of observational studies were reviewed and summarized, but of the four quasi randomized controlled trials, one controlled trial and one interrupted time series studies, none met with the inclusion criteria.	Observational studies suggest that a number of factors related to student selection criteria, undergraduate and postgraduate training, financial incentives, regulatory measures and personal and professional support may influence health professionals' choice to practise in underserved areas. Strategies that have shown promise include selection of students with a rural background, the establishment of university departments and/or teaching clinics in rural areas, rural and scarce skills allowances and enhanced professional and personal support. However, these findings await confirmation or refutation by means of well-designed studies in which bias and confounding are minimized.	Grobler L et al. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas (Review). *The Cochrane Library,* 2009, Issue 1.
Retention	Pacific and Asian countries	Motivation and retention of health workers	All health workers	This review draws on literature and information gathered from web sites and databases. The study aimed to highlight the situation of health workers in the region, examine evidence on initiatives to retain health workers (particularly in rural and remote areas) and suggest ways to address health worker shortages.	There was no description of the methodology used for the literature review, but the study provided numerous summaries of relevant studies from the Pacific and Asian region.	Incentive packages to attract, retain and motivate health workers should be embedded in comprehensive workforce planning and development strategies in Pacific and Asian countries. Improved salaries and benefits, together with improved working conditions, supervision and management, and education and training opportunities are important. Country-specific strategies require examination of the underlying factors for health worker shortages, analysis of the determinants of health worker motivation and retention, and testing of innovative initiatives for maintaining a competent and motivated health workforce. Continued research and evaluation required.	Henderson LN, Tulloch J. Incentives for retaining and motivating health workers in Pacific and Asian countries. *Human Resources for Health,* 2008, 6:18.

Category of intervention	Country	Intervention	Cadre(s)	Description	Study design and methods	Reported results	Reference
Retention	Global	Attraction and retention in remote rural areas in middle- and low-income countries	All health workers	This narrative literature review aims to explore the links between attraction and retention factors and strategies, with a particular focus on the organizational diversity and location of decision-making.	This literature review retrieved relevant studies from PubMed and a number of relevant journals. A total of 55 articles were included in the final review.	"From the literature review, it is evident that certain strategies, such as targeted recruitment and training as well as incentives and compulsion are frequently reported. However, strategies which address immediate living environments are less commonly described in the literature, even though such strategies would be investments not only for the health sector but for the entire population. Interestingly, the literature also reports little evidence of strategies which address management and working conditions at the work place, although the importance of the immediate working environment on attraction and retention has been identified in numerous studies ... because of the complexity of attraction and retention, there is a strong argument to be made for bundles of interventions."	Lehmann U, Dieleman M, Martineau T. Staffing remote rural areas in middle- and low-income countries: A literature review of attraction and retention. *BMC Health Services Research,* 2008, 8:19.
Retention	Developing countries	Motivation and retention of health professionals	All health workers	This systematic review sought to review and analyse evidence on the impact of financial and non-financial incentives on the motivation and retention of health personnel.	20 studies met with the inclusion criteria for this systematic review; they consisted of a mixture of qualitative and quantitative studies.	Seven major themes regarding motivational factors were identified: financial, career development, continuing education, hospital infrastructure, resource availability, hospital management and personal recognition or appreciation. Recognition and/or appreciation, either from managers, colleagues or the community was a theme found in 70% of studies. In some articles, recognition by the employer and community was cited as being one of the most important motivating factors for health workers.	Willis-Shattuck M et al. Improving motivation and retention of health professionals in developing countries: a systematic review. *BMC Health Services Research,* 2008, 8:247.
Retention	Global	Recruitment and retention of doctors to rural and remote areas	Physicians	This literature review aimed to provide a comprehensive overview of the most important studies addressing the recruitment and retention of doctors to rural and remote areas.	This literature review was based on a comprehensive review of the PubMed database. The review included primary intervention studies, as well as retrospective observational studies and questionnaire-driven surveys. A total of 110 articles were retrieved. None of the evidence included in the review was rated as “convincing”, although evidence in the “selection” category was rated a “strong”.	The authors categorized the available evidence into five categories: selection, education, coercion, incentives and support. They concluded that there is strongest evidence and therefore a need for implementation of strategies related to selection policies and developing more medical schools in rural areas or developing more satellite rural campuses. They deemed there was moderate evidence in relation to rural exposure during training, scholarships with rural service agreements and rural outreach/support schemes. There was weak or absent evidence in relation to coercive policies.	Wilson NW et al. A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural and Remote Health,* 2009, 9:1060.
Retention	Global	Incentives to improve recruitment, motivation and retention	All health workers	This was a descriptive review of both financial and non-financial and their role in improving the recruitment, motivation and retention of health workers.	Descriptive literature review, although no further details are provided on the methodology of the review.	Incentives, both financial and non-financial, provide one tool that governments and other employers can use to develop and sustain a workforce with the skills and experience to deliver the required care. This demands not just political will and continued hard work, but an acknowledgement by all key stakeholders of the commitment, skills and health benefits provided by health professionals worldwide. The review concluded that an effective incentive scheme should have clear objectives, be realistic and deliverable, reflect health workers' needs and preferences, be well-designed, contextually appropriate, fair and equitable, be measurable, and include both financial and non-financial elements.	*Guidelines: Incentives for health professionals*. Geneva, International Council of Nurses / International Hospital Federation / International Pharmaceutical Federation / World Confederation for Physical Therapy / World Dental Federation / World Medical Association, 2008 (http://www.who.int/workforcealliance/documents/Incentives_Guidelines%20EN.pdf, accessed 24 March 2010).