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[Intervention Review]

Interventions to manage dual practice among health workers

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ABSTRACT

Background

Dual practice, whereby health workers hold two or more jobs, is a common phenomenon globally. In resource constrained low- and middle-income countries dual practice poses an ongoing threat to the efficiency, quality and equity of health services, especially in the public sector. Identifying effective interventions to manage dual practice is important.

Objectives

To assess the effects of regulations implemented to manage dual practice.

Search methods

Databases searched included: The Cochrane Central Register of Controlled Trials (CENTRAL) 2011, Issue 4, part of *The Cochrane Library*. www.thecochranelibrary.com, including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 26 May 2011); MEDLINE In-Process & Other Non-Indexed Citations May 24, 2011 (searched 26 May 2011); MEDLINE, Ovid (1948 to May week 2 2011) (searched 26 May 2011); EMBASE, Ovid (1980 to 2011 week 20) (searched 26 May 2011); Science Citation Index and Social Sciences Citation Index, ISI Web of Science (1975 to present) (searched 04 December 2009); LILACS (searched January 2010); and AIM (December 2009) (searched 18 December 2009).

Selection criteria

Randomized controlled trials, non-randomized controlled trials, controlled before-and-after studies and interrupted-time-series studies. Dual practice was defined as holding more than one job. Studies for inclusion were those focusing on interventions to manage dual practice among health professionals employed in the public health sector.

Data collection and analysis

Two review authors independently applied the criteria for inclusion and exclusion of studies when scanning the identified titles and abstracts. The same two review authors independently screened full reports of selected citations. At each stage, results were compared and discrepancies settled through discussion.

Main results

No studies were found which were eligible for inclusion in this review.

Authors' conclusions

There is a need to rigorously evaluate the effects of interventions implemented to manage dual practice among health workers. However, there is still much that is unknown about dual practice itself. The designing of studies to evaluate the effects of interventions to manage dual practice could benefit from prior studies to assess the various manifestations of dual practice, their prevalence and their likely impacts on health services delivery. These findings would then inform the design of studies to evaluate interventions to manage dual practice.

PLAIN LANGUAGE SUMMARY

Interventions to manage health worker dual practice (holding more than one job)

Researchers in The Cochrane Collaboration set out to conduct a review of studies on the effect of interventions to stop or to regulate the practice among health workers of having more than one job (dual practice). However, after searching for all relevant studies, they were unable to find any studies that met their requirements for inclusion in the systematic review.

Interventions to regulate dual practice

Many health professionals have two or more jobs. This is referred to as dual practice. In many low- and middle-income countries, low pay and difficult working conditions lead many health workers in the public health sector to add to their income by taking on private patients who pay for the services that they receive. In addition to this extra income, work in the private sector may also offer advantages such as higher status, more control over working hours and better professional opportunities.

By allowing public sector health workers to supplement their income, it may be easier for the public sector to keep their skilled health workers. This type of dual practice may also lead health workers to spend less time in their public sector job, and may also encourage some health workers to be inefficient and corrupt. For instance, they may take time off without permission to go and work in their private positions; they may lower the quality of their services in the public sector in order to drive patients to their private practice; or they may take resources such as transport and drugs from their public sector workplace to use in their private sector jobs.

In some countries, governments have imposed a ban on dual practice, or have attempted to regulate how many hours their health workers are allowed to conduct a private practice or how much they are allowed to earn from this practice by imposing mandatory licenses and private sector price ceilings. In other countries, health workers are given special incentives such as higher salaries and promotions if they agree to only work in the public sector, while other countries have allowed limited private practice (health workers seeing private patients) within public facilities.

What happens when efforts are made to regulate dual practice?

These efforts to regulate health worker dual practice have not been properly evaluated, therefore the review authors were not able to find any studies that met their stated requirements for types of study designs. The review shows that there is a huge gap in our knowledge about the effectiveness of policy interventions that attempt to regulate health worker dual practice.

BACKGROUND

Holding two or more jobs, also referred to as dual practice in the healthcare setting, has been documented as a common practice in both high income countries (HIC) and low- and mid-

dle-income countries (LMIC) (Eggleston 2006; Gonzalez 2004; Rickman 1999; Roenen 1997). The practice refers to the holding of more than one job by a health professional. It may encompass health professionals working within different aspects of health,

such as allopathic medicine combined with traditional medicine; or combining health related activities such as clinical practice with research (Ferrinho 2004). In most low- and middle-income countries (LMICs), dual practice refers to health professionals engaged in work in both the publicly funded and private (health or non-health) sectors (Ferrinho 2004). Non-health related dual practice has been reported too, with the engagement of health workers in agricultural or other economic activities to earn additional income, for example (Asiimwe 1997; Roenen 1997).

Description of the condition

In most LMIC, the inadequate remuneration of staff in the public health sector, coupled with the growth of the private health sector, have been a driving force behind reports of increases in dual practice (Roenen 1997). Dual practice has been a coping strategy for health workers to meet the economic demands they face, by supplementing their public sector salary with private patients paying on a fee-for-service basis (Jumpa 2007). However, non-financial incentives such as status and recognition, strategic influence, control over work and professional opportunities have also been identified as contributory factors (Garcia-Prado 2007; Humphrey 2004). The private sector plays an increasingly significant role in service delivery, ranging from providing services for 14% of the population in Thailand to 70% in Zimbabwe, and the rise of dual practice has been attributed in part to the mostly unregulated growth of the private health sector (Ferrinho 2004). Limited human resources, inadequate pay and poor working conditions in the public sector have meant that the private sector can compete favourably with the public sector for health workers (Ferrinho 2004; Jumpa 2007).

The extent of dual practice varies from country to country and does not seem to be greatly affected by the presence or absence of regulatory policies. For instance in Indonesia, where regulations against dual practice have been attempted, the prevalence of the practice is reported to be more than 80%, while in permissive Egypt and Bangladesh 89% and more than 80% of physicians, respectively, engage in dual practice (Berman 2004). Some of the effects of dual practice were categorised exhaustively in a global review by Ferrinho (2004). Among the positive consequences was its ability to generate additional income for health workers (Asiimwe 1997; Ferrinho 2004). This could also be interpreted as minimising the budgetary burden on the public sector to retain skilled staff, especially given the scarcity of resources in the public sector (Roenen 1997). Also acknowledged is the increased contribution of the private health sector to the provision of health services.

But the negative impacts of dual practice may by far exceed the positive. These negative impacts include the perpetuation of self gain by health workers through generating demand for their own services in the private sector by over prescribing treatment; conflicts of interest, whereby health workers lower the quality of services they provide in the public sector in order to drive patients

to the private sector; and 'brain drain', whereby the existence of the private sector makes it increasingly hard to attract and retain health workers in the public sector. Dual practice may also be associated with competition for time since health workers engaged in dual practice are available for less time at public facilities, thereby compromising service delivery. There is evidence that the performance and conduct of health workers engaged in dual practice and under government employment may be unsatisfactory (Ferrinho 2004). Absenteeism, tardiness, inefficiency and lack of motivation have frequently been cited as consequences of dual practice among public sector health workers. The illegal and unquantifiable outflows of resources, whereby public sector resources such as transport, drugs and sundries are diverted to the private sector, are also increasingly documented. Ferrinho 2004 reports that health managers have in some instances been forced to compromise their management ideals by allowing dual practice in order to retain their highly skilled employees, sometimes to the detriment of service provision.

Description of the intervention

Initiatives that have been implemented to prevent or manage dual practice include the following (adapted from an analysis by Garcia-Prado 2007).

1. *Complete prohibition*: this has been employed as a regulatory mechanism in Canada (Flood 2001), China (Bian 2003), India (Berman 2004) and Greece (Mossialos 2005). In other countries complete prohibition has been enforced for a period of time. For instance, in Indonesia, after three years of exclusive public service health workers can conduct private practice but only after the close of an official work day (Berman 2004). In Kenya and Zambia, only junior doctors in public service are not allowed to practice privately (Berman 2004) while licenses are required for senior doctors to practice privately and in China dual practice is not officially condoned but it is still practiced on a large scale (Bian 2003). In Spain and Portugal, attempts to ban dual practice through pilot projects have been unsuccessful and have not been implemented nationwide.

2. *Restrictions on private sector earnings*: in the UK, senior specialists contracted on a full time basis are allowed to earn up to 10% of their gross income while those on a part time contract have no restrictions but have to remit almost 10% of their public salary (European Observatory on Health Systems Policy 2004). In France, private earnings are restricted to 30% of their gross income (Rickman 1999).

3. *Providing incentives for exclusive public service*: in Spain, Portugal, Thailand, India and Italy, public health sector workers are offered exclusive contracts in addition to salary supplements and promotions in order to curb private practice (Bentes 2004; Oliveira 2005). In Spain, for instance, different work contracts are offered with higher salaries for those committing more time to the public

sector, while in Italy promotions are only given to those in exclusive public service.

4. *Raising health worker salaries*: the use of competitive public sector salaries to discourage private practice has been tested using a discrete choice model in Norway (Saether 2003), that is a survey using hypothetical scenarios. This experiment revealed that increased public sector wages could lead to an increase in work hours committed to the public sector. A survey in Bangladesh suggested that the majority of doctors providing primary health care services would give up dual practice if public sector salaries were raised, while doctors in secondary and tertiary care, who might be most needed in LMICs, were unwilling to give up dual practice (Gruen 2002).

5. *Allowing private practice in public facilities*: this is practiced in Italy, Austria, Germany and France (Rickman 1999). In Italy, public hospitals are required to reserve 6% to 12% of their beds for private patients while in Austria doctors can treat privately insured patients in a special section of the public hospitals (Stepan 2005).

6. *Self-regulation*: the possibility of this approach has been recognised, especially in high income settings where the regulation of medical staff is conducted by professional organisations. It is argued that professional culture and ethics could act to discourage undesirable practices associated with dual practice and thereby guarantee sufficient professional performance and quality of care (Garcia-Prado 2007).

7. *Regulation of the private sector*: in high income countries like Canada this has been used to limit private practice proliferation, by imposing ceilings on private sector prices, limiting access of private sector to social insurance and limiting the type of services that can be offered in the private sector. These measures have been credited with reducing the extent of private sector practice in Canada (Flood 2001).

How the intervention might work

The support of health workers themselves is necessary to effect complete prohibition, as well as for other strategies including the reporting of percentage of income obtained from public or private sector work and regulation by professional bodies. In addition, where incentives depend on the income statistics of individual health workers, one would need honesty on the part of the health workers in declaring their income, especially where much of the economy is informal.

Personal compliance, adequate financing of the health sector and capacity of public health facilities to provide a satisfactory working environment for the health workers would contribute to the success of the interventions. Other necessary components are the capacity to enforce regulations and to monitor their enforcement. Without adequate financing of the health sector, one cannot adequately provide incentives for exclusive public service or raise health workers' salaries. Unless public sector health workers feel that staying in their posts is better than working in the private sec-

tor, health workers may opt to go completely private. On the other hand, restricting private sector earning might work if fee ceilings are set thereby reducing the gains made by dual practitioners in the private sector. Theoretical work by (Biglaiser 2007) suggests that private sector fee ceilings can improve public sector service quality.

The co-existence of private health services within public facilities could succeed if sufficient resources were available in terms of infrastructure, resources and personnel to deliver private care. Where this is not the case, a situation would be created whereby within the public facility the resources are shifted to the private care section ultimately compromising the quality of public health services. An example of this may be in instances where public facility health workers are not as well remunerated as those working in the private section of the same facility.

With regard to self regulation, strong professional bodies and empowered civil society organisations would be necessary to ensure that health workers adhere to guidance by reporting abuses of the system.

Why it is important to do this review

Dual practice has consequences for the equity, efficiency and quality of health care, which makes it an important issue to consider, especially in the current global human resources crisis for health (Garcia-Prado 2007). No systematic reviews of the effects of interventions to reduce dual practice or its consequences are currently available.

OBJECTIVES

To assess the effects of interventions that are implemented to manage dual practice.

METHODS

Criteria for considering studies for this review

Types of studies

- Randomised controlled trials (RCTs).
- Non-randomised controlled trials (nRCTs).
- Controlled before and after studies in which there were at least two clusters in each comparison group, the pre and post-intervention periods for the study and control groups were the same and the choice of control site was appropriate.

- Interrupted time series analyses if the point in time when the intervention occurred was clearly defined and there were at least three data points both before and after the intervention.

There were no restrictions in terms of where studies were conducted. Articles in English and Spanish were considered.

Types of participants

Included: all health professionals, such as physicians, nurses, midwives, nursing assistants, pharmacists, physiotherapists, occupational therapists, dentists, dental assistants, laboratory technicians, dispensers, medical assistants or clinical officers and radiographers. Relevant support staff such as health managers.

Excluded: non-professional (lay) health workers, such as nurse aides and community health workers.

Types of interventions

[Garcia-Prado 2007](#) documented the various methods that governments have used worldwide to address the issue of dual practice. For this review, dual practice was defined as the holding of more than one job by a health professional. Among the approaches identified and considered in this review were the following.

1. Complete prohibition, also referred to as banning of dual practice.
2. Restrictions on private sector earnings: imposing a ceiling on income which can be earned as a result of the additional jobs.
3. Providing incentives for exclusive public service: this would include both financial (allowances, bonuses) and non-financial incentives, such as promotions.
4. Raising health worker salaries: this includes measures to make public sector salaries more competitive.
5. Allowing private practice in public facilities: this includes arrangements for allowing private sections to be established within public hospitals or for physicians to admit their private patients to public facilities.
6. Self-regulation: this includes the promotion of professional and ethical conduct among health workers, under the oversight of professional bodies and civil society.
7. Regulation of the private sector: this could include imposing ceilings on private sector prices, limiting access of the private sector to social insurance and limiting the types of services that can be offered in the private sector.

Types of outcome measures

Studies considered for inclusion had to have assessed at least one of the following outcomes, or any other relevant outcomes identified in the course of the review.

Primary outcomes

- Increased working hours by health workers in publicly funded health facilities
- Reduced patient waiting times
- Reduced absenteeism per week, month or year
- Reduced sick days per week, month or year.

Unintended outcomes considered included:

- health worker migration from the public sector
- increases in unofficial payments (sometimes called 'under the table' payments)
- reduced motivation among health care providers
- competition between private and public practice
- increased illegal dual practice.

Secondary outcomes

These included:

- reduction in the number of private sector practice licences issued
- reduction in private earnings by health workers
- reduced job satisfaction.

Search methods for identification of studies

Electronic searches

I. We searched the following electronic databases for primary studies:

- The Cochrane Central Register of Controlled Trials (CENTRAL) 2011, Issue 4, part of *The Cochrane Library*. www.thecochranelibrary.com, including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 26 May 2011);
- MEDLINE In-Process & Other Non-Indexed Citations May 24, 2011 (searched 26 May 2011);
- MEDLINE, Ovid (1948 to May week 2 2011) (searched 26 May 2011);
- EMBASE, Ovid (1980 to 2011 week 20) (searched 26 May 2011);
- Science Citation Index and Social Sciences Citation Index, ISI Web of Science (1975 to present) (searched 04 December 2009);
- LILACS (searched 28 January 2010);
- AIM (1948 to Week 40 2009) (searched 17 October 2009).

Search strategies for primary studies in electronic databases incorporated the methodological component of the Cochrane Effective Practice and Organisation of Care (EPOC) search strategy combined with selected index terms and free text terms. We translated the MEDLINE search strategy into the other databases using the

appropriate controlled vocabulary, as applicable. The full search strategies for all databases are included in [Appendix 1](#).

Searching other resources

II. Other resources that were searched were:

- WHOLIS;
- World Bank;
- Google Scholar;
- Relevant websites.

The websites included those of the Global Human Resources for Health resource centre (www.hrhresources.org), the Human Resources for Health Online journal (www.human-resources-health.com), the Health Resources and Services Administration Website of the U.S. Department of Health and Human Services (www.hrsa.org), the Management Services for Health Electronic Resource Centre (<http://erc.msh.org>), the global health trust resource centre (www.globalhealthtrust.org), and the World Health Organization Regional European Observatory (www.euro.who.int/observatory).

III. Reference lists of identified, relevant papers.

IV. Key experts, relevant authors and government officials were contacted for other relevant, unpublished articles.

Data collection and analysis

Our electronic searches produced a total of 3460 abstracts or titles, or both. Search results, including abstracts when available, were entered into Reference Manager 11. Two review authors (SNK and CN) independently screened the titles and abstracts of all articles obtained from the search. The Spanish language database was searched by Gabriel Rada (Chile Methodology Centre).

Selection of studies

We retrieved full copies of all potentially relevant articles selected by either of the review authors. The two authors then independently determined if studies met the inclusion criteria. Studies that initially appeared to meet the inclusion criteria but were later excluded are listed in the table 'Characteristics of excluded studies' with reasons for their exclusion. Disagreements between the two review authors were resolved through discussion with a third review author (GWP). Potentially relevant studies in Spanish were translated by collaborators within the group for consideration for inclusion.

Data extraction and management

Data extraction was planned by two review authors (SNK and CN) using a data extraction form adapted from those used by EPOC, but no studies met our inclusion criteria. Information was planned

to be extracted on study design; type of intervention; duration of intervention; intensity of the intervention, for example the extent to which restrictions were monitored and enforced and the magnitude of penalties or rewards; characteristics of the participants, including the types of health professionals, types of patients (for example outpatient or inpatient) and numbers of participants; context or setting, including the country or region within the country; World Bank classification as a low, middle or high income country; available baseline characteristics such as the amount of dual practice, salary levels, and availability of health professionals. We planned to contact the corresponding authors of included studies to obtain any missing data. Details of our planned data synthesis are outlined in [Table 1](#).

Assessment of risk of bias in included studies

No studies were found to be suitable for inclusion. In future updates of this review, eligible studies will be assessed for risk of bias by two independent review authors (SNK and CN) using the methodological quality criteria set out in the EPOC risk of bias checklists for randomized and non-randomised controlled trials (RCTs and nRCTs), interrupted time series (ITS) and controlled before and after (CBA) studies.

RESULTS

Description of studies

Not applicable

Risk of bias in included studies

No studies were eligible for inclusion in this review.

Effects of interventions

The electronic search identified 3460 records, of which none were eligible for inclusion after screening.

DISCUSSION

Despite the documented implementation of a range of interventions to manage dual practice, this study found no eligible studies assessing their effects. It is possible, however, that the language restriction in our search strategy may have resulted in studies in languages other than English and Spanish having been missed.

Existing descriptive studies highlight arguments both for and against the regulation of dual practice (Berman 2004; Ferrinho 2004; Juma 2007). The importance of acknowledging the existence of dual practice is also noted, because without acknowledging the practice policy makers cannot develop policies or regulations to manage it. These descriptive studies also acknowledge the need to commission studies on the extent of dual practice and its potential impacts on service quality (Berman 2004; Ferrinho 2004; Juma 2007). These authors also tend to agree that dual practice should be regulated and put forth arguments as to why. For instance, Juma 2007 notes that regulation encourages certain norms of behaviour that cannot be achieved spontaneously through the cooperation of individuals. Regulation may also help to define parameters of professional conduct. Berman 2004 posits that for resource constrained settings, better regulated dual practice might be more efficient economically than wide spread unregulated services.

Given that there are no well-designed studies (in which bias and confounding are minimised) to support any of the numerous interventions that have been implemented to manage dual practice, this review presents a summary of descriptive studies on the interventions that have been attempted but for which short and long term impacts remain poorly quantified. Because of their design, these country case studies do not provide evidence of the effects of dual practice interventions. These interventions would need to be tested in LMICs and the need for further research is highlighted below. According to Brown 2006, research recommendations in systematic reviews often fall short of providing the necessary guidance for future research as these recommendations do not provide sufficient detail on the interventions that should be evaluated. These researchers propose an EPICOT+ framework, which incorporates the current state of evidence, the target population, the intervention of interest, the desired outcome, the comparison group and time stamp (or date of recommendation) in order to identify research needs (Brown 2006). Tables 1 to 4 summarize the need for further research based on this framework. The range of possible interventions to manage dual practice are also discussed further below.

Regulatory mechanisms

Descriptive studies have reported a range of regulatory mechanisms, none of which have been evaluated rigorously. In general, the dual practice interventions described were aimed at limiting or controlling the extent of activities in the private sector by public sector providers, although one study (Stepan 2005) reported on the policy adopted by the Austrian government to contract private sector providers (who are self employed) to provide primary care services and receive payments from the social health insurance institutions.

In the studies examined, packaging or combining interventions across the six broad categories of interventions considered in

this review was seen commonly. Notably, countries which implemented dual practice regulatory mechanisms tended to combine several approaches across different categories, implying that in many settings a single 'recipe' to manage dual practice might not be feasible or useful.

Financial and licensure restrictions

Financial and licensure restrictions have been attempted in HICs and LMICs to manage dual practice (Oliveira 2005). Financial restrictions included limiting private sector earnings, providing incentives to limit private sector activities, salary increases for public sector workers and performance based payments. A combination of tax-based public financing, mandatory health insurance and private insurance might be necessary to meet the financial resource demands of this approach while supervision, monitoring systems and transparent bureaucracies would be necessary to ensure that private sector activities and earnings are indeed limited and that payments are matched by performance. Restricting private sector earnings can potentially improve public service quality by reducing the adverse behavioural reactions of public providers, for instance in situations where providers lower the quality of services in the public sector so as to encourage consumers to use the private sector. However, financial systems to enforce this do not exist in most LMICs since systems to monitor private sector payments are non-existent. Flexible contracts allowing degrees of dual practice reveal that public providers tended to favour higher degrees (more time) of private sector activity as opposed to lower degrees (less time). In short, when offered the possibility to engage in dual practice, providers maximised earnings from both sectors (Oliveira 2005). In most LMICs, where health sector budgets are small and salaries are very low, raising public sector salaries may not be feasible. Yet in Portugal the policy on increasing salaries for public sector workers appeared not to alter their private sector activities (Oliveira 2005), highlighting the need to evaluate interventions that link salary increases with additional regulations. It was noted that all financial restrictions intrinsically require well established and adequate health financing systems to fund and monitor both public and private sector activity (Oliveira 2005).

A novel hypothetical approach was proposed by Ferrinho 2004, whereby public sector providers are remunerated on a performance linked basis instead of by salaries alone. This approach is based on the argument that since incentives to shift effort from public to private sectors are related to effort (output), public sector providers should also be remunerated based on performance. The authors note, however, that public sector workers might lose motivation if remuneration under pay-for-performance remains constant, or even less, than salaried payment. A variation in this approach is reported in Austria where private providers are contracted on a pay-for-performance basis to provide services in the public sector. The authors suggest that this may result in healthy competition between public and private providers to deliver quality services.

The applicability and feasibility of both approaches merit further investigation, especially in resource constrained settings. Studies which reported on licensure restrictions focused on the need for mandatory licenses to engage in dual practice, restriction of dual practice to more experienced senior practitioners, restriction of time spent on private sector activities and allowing minimal dual practice within public facilities. Violation of all of these regulations has been reported in the form of nurses and junior health workers running private practices under the licenses of senior practitioners or practitioners who spend more time in the private sector than they report (Berman 2004). Evaluation of these approaches is needed to see how they work and how they can be implemented without well established enforcement systems.

Self regulation

Self regulation to manage dual practice, drawing upon the professional ethics and standards of public sector providers, could potentially restrict dual practice. However, these require well developed civil society or consumer organisations to respond to violations and also strong professional regulatory bodies (Delay 2004).

Allowing dual practice

Allowing dual practice without restrictions was noted in countries like Indonesia and Egypt where dual practice is routine and accepted. An interesting point to note is that in both countries the production of physicians far exceeded the capacity of the public sector to employ them. Because of the low salaries offered in the public sector, physicians are allowed to supplement their incomes with private sector earnings (Berman 2004). This approach is unlikely to be feasible in countries with health worker shortages.

Allowing dual practice in public facilities

Descriptive studies report that the quality of services, supervision and monitoring of dual practice might be improved by allowing minimal dual practice within public facilities since specialised physicians are encouraged to stay in public facilities. However, this approach presents the challenge of prioritising between public and private patients and the risk of uncontrolled proliferation of private sector activities within public facilities (Sandier 2004; Stepan 2005).

Regulating the private sector

A country case study from Canada reported that regulating private sector activities might reduce the incentive of public providers to undertake dual practice. Canada emerges as a country which has successfully managed to reduce dual practice by making private practice unappealing to public providers. This has been done by restricting the types of services offered in the private sector to those

not offered in the public sector and by placing restrictions on private sector charges. Furthermore, services insurable in the private sector were restricted to only those not covered by universal insurance. By restricting private provider access to public funding, the financial incentives driving dual practice were reduced (Flood 2001). These approaches have been facilitated by Canada's well-resourced health sector, universal insurance coverage and well established financial monitoring systems, which might not be available in LMICs thereby threatening the potential effectiveness of this approach.

AUTHORS' CONCLUSIONS

Implications for practice

There is a lack of rigorous evidence regarding the effects of interventions to manage dual practice although some countries have implemented some strategies aimed at managing it. These strategies have included the introduction of financial and non-financial incentives, mandating licenses for private practice, limiting earnings from the private sector, limiting the types of services offered in the private sector and allowing limited private practice within public facilities. Evaluations of the effectiveness of these strategies are needed in order to determine their impact.

Implications for research

Descriptive studies report several strategies that have been implemented to manage dual practice and the effect of these strategies needs to be evaluated rigorously in various settings. Brown 2006 proposes that recommendations for further research should be based on the EPICOT+ framework, which incorporates the current state of evidence, target population, intervention of interest, desired outcome, comparison group and the date of recommendation to identify research needs (Brown 2006). This framework has been used in this review to propose areas for further research (see details in Table 2, Table 3, Table 4, and Table 5). Future studies should also consider the managerial and financial systems necessary to make interventions work as well as how interventions might be packaged together, given that countries that have attempted to manage dual practice have often used multiple strategies simultaneously. The paucity of literature on the extent, variations and impact of dual practice, financially and in terms of management, indicates that more research is also needed on these aspects.

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* *Indicates the major publication for the study*

DATA AND ANALYSES

This review has no analyses.

ADDITIONAL TABLES

Table 1. Methods of the review

Assessment of risk of bias in included studies	<p>Allocation concealment of intervention assignment and methods for generation of the sequence of allocations will be summarised along with any judgements concerning the risk of bias that may arise from the methods used</p> <p>A summary of who was blinded during the conduct and analysis of the trial will be reported here. Blinding of outcome assessment will be summarised for each main outcome. Judgements concerning the risk of bias associated with blinding will be summarised</p> <p>The completeness of data will be summarised here for each of the main outcomes. Concerns over exclusion of participants and excessive (or differential) drop-out will be reported</p> <p>Concerns over the selective availability of data will be summarised here, including evidence of selective reporting of outcomes, timepoints, subgroups or analyses</p> <p>Any other potential concerns will be summarised here.</p>
Dealing with missing data	<p>Authors of included studies will be contacted for missing data and findings will be assessed for inclusion into the analyses</p>
Assessment of heterogeneity	<p>We will prepare tables and box plots comparing effect sizes of studies grouped according to potential effect modifiers. These will include:</p> <ol style="list-style-type: none">1.Type of health professional.2.Type of intervention.3.Duration of education/ intervention.4.Outcomes of intervention.5.Setting and contextual factors: public/private school, full time /distance education.6.Study design RCT, nRCT, CBA, ITS.7.Methodological quality of studies. <p>We expect to find substantial variation in the study results due to differences in types of interventions, the type of health care professional (targeted population), the design of the intervention, duration of the intervention and the context in which the intervention is implemented. We plan to conduct sub-group analyses based on type of intervention, type of health professional and study setting if we find two or more studies considering the same outcomes or using the same intervention in a similar population</p>
Data synthesis	<p>For each study meeting our inclusion criteria we will report the main results in natural units and calculate the change data if it is not reported.</p> <p>The results for all comparisons will be presented using a standard method of presentation where possible. We will prepare tables and box plots comparing effect sizes of studies grouped according to potential effect modifiers. The type of intervention is the most likely effect modifier. In cases where there is banning of dual practice, more effects are expected to be seen as opposed to cases of self regulation. Effects will also vary based on the intensity of monitoring and penalties imposed as a result of violating</p>

Table 1. Methods of the review (Continued)

	the regulations. Other effect modifiers will include: type of health professional; and duration and level of intervention, with those interventions at organisational level expected to be more effective than those at government level
Subgroup analyses	We expect to find substantial variation in the study results due to differences in types of interventions, the types of health care professional (targeted population), the design of the intervention, duration of the intervention and the context in which the intervention is implemented. We will group studies based on the type of intervention and summarise the results together with the key explanatory factors in tables. The results will be summarised in natural units, as reported by the investigators. If there are more than one study of the same intervention reporting similar outcomes, we will attempt to standardise those outcomes (e.g. as relative percentage change from baseline) and we will qualitatively explore the extent of heterogeneity and the extent to which the above factors might explain any important differences in results

Table 2. Proposed research to evaluate total banning as an approach to managing dual practice

Research focus 1	Core element	Issues to consider	Example
Intervention	Total or partial banning of dual practice	The intervention could include all health workers but could also be targeted at some and not others, for instance junior staff and not specialists	Exclusion of specialists in a total ban of dual practice may be crucial in countries with specialist shortages
Existing literature	These interventions have been examined in policy analyses and cross-sectional studies that did not meet the inclusion criteria for this review (Berman 2004).	Existing literature consists of case reports from countries implementing policies banning dual practice	Portugal and Greece have introduced policies banning dual practice (Oliveira 2005; Mossialos 2005)
Population	Health professionals	Requires health workers in each sector to be adequately remunerated	
Comparison	No banning		
Outcome	Migration of health workers from one sector to another; absenteeism; tardiness (also known as late coming); violation of ban; total income	<ul style="list-style-type: none"> • Health workers may migrate from one sector to another • International migration may occur • Under counter payments may increase • Need to consider whether the total income of health workers can be measured. 	Migration of health workers across sectors has been reported (Oliveira 2005). Lack of specialists in the least favoured sector have been reported (Oliveira 2005).

Table 2. Proposed research to evaluate total banning as an approach to managing dual practice (Continued)

Study design for research	Controlled before and after studies Interrupted time series studies	These designs may be at higher risk of bias, compared to RCTs, as they may not be able to control adequately for unknown confounders	
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Table 3. Proposed research to evaluate financial restrictions as an approach to managing dual practice

Research focus 2	Core element	Issues to consider	Example
Intervention	Financial restrictions / incentives	<ul style="list-style-type: none"> • Restriction of private earnings • Providing incentives to health professionals in the public sector in order to discourage dual practice • Salary increases for public sector workers • Performance based financing (remuneration). 	Increasing health worker salaries to manage dual practice has been attempted in Portugal (Oliveira 2005).
Existing literature	Only anecdotal evidence regarding these interventions is available (Oliveira 2005).	Country case studies suggest that increasing salaries may not reduce dual practice	Health workers tend to maximise earnings from both private and public sectors if given the opportunity (Oliveira 2005).
Population	Health professionals	Intervention may require centralised monitoring of earnings.	
Comparison	No restrictions No incentives		
Outcome	Total earnings Accumulated assets	Some countries do not have a centralised method of tracking employee earnings	Earnings from other informal activities may not be traceable
Study design for research	Randomised controlled trials Controlled before and after studies Interrupted time series	Some of these designs may be at higher risk of bias, compared to RCTs, as they may not be able to control adequately for unknown confounders	

Table 4. Proposed research to evaluate licensure restrictions as an approach to managing dual practice

Research focus 3	Core element	Issues to consider	Example
Intervention	Licensure restriction	Licenses for practicing privately may be restricted to specialists or senior professionals with a mandated period of exclusive public service for junior professionals	Licensure restrictions have been attempted in Malawi (Berman 2004).
Existing literature	Only anecdotal evidence regarding these interventions is available	The available literature is from country case studies.	Abuse of the intervention has been reported, with senior professionals hiring junior professionals to work in their private practices (Berman 2004).
Population	Health professionals		
Comparison	No restrictions in licensing of dual practice		
Outcome	<ul style="list-style-type: none"> • Time spent at primary duty station • Absenteeism • Number of licenses issued, and to who. 	<p>Measuring of outcomes is extremely labour intensive and prone to measurement bias</p> <p>Strong regulatory bodies are required to monitor implementation</p>	Requires well established systems, employment policies and monitoring of licenses issued
Study design for research	Interrupted time series Controlled before and after studies	These designs may be at higher risk of bias, compared to RCTs, as they may not be able to control adequately for unknown confounders	

Table 5. Proposed research to evaluate the regulation of the private sector as an approach to managing dual practice

Research focus 1	Core element	Issues to consider	Example
Intervention	Regulation of private sector	<ul style="list-style-type: none"> • Restrict the type of services offered in private sector to specialised services only • Restrict private sector charges / impose ceilings on private sector earnings • Restrict the services insurable in the private sector • Restrict private provider access to public financing. 	These interventions have been implemented in HICs, such as Canada. Some may also be applicable to LMICs. Systems to track private sector earnings may not exist in some settings

Table 5. Proposed research to evaluate the regulation of the private sector as an approach to managing dual practice (Continued)

Existing literature	Only anecdotal evidence regarding these interventions is available	Cross-sectional studies and policy analyses of packages of the interventions listed above have reported that these have led to poor motivation among health workers employed in the public sector to pursue part time work in the private sector	Studies from Canada (Flood 2001) suggest that regulating private sector activities and earnings may affect dual practice
Population	Health professionals		
Comparison	No intervention		
Outcome	<ul style="list-style-type: none"> • Private sector earnings/charges • Private sector licenses issued 	Earnings not easy to measure in countries where a centralised financing system does not exist Strong regulatory bodies are required to monitor implementation	
Study design for research	Controlled before and after studies Interrupted time series	These designs may be at higher risk of bias, compared to RCTs, as they may not be able to control adequately for unknown confounders	

APPENDICES

Appendix I. Search strategies

MEDLINE In-process & other non-indexed citations + MEDLINE, Ovid

1. Employment/lj [Legislation & Jurisprudence]
2. Health Manpower/lj [Legislation & Jurisprudence]
3. or/1-2
4. Private Practice/
5. Private Sector/
6. exp Hospitals, Private/
7. ((private adj3 practice?) or private hospital? or private clinic? or private sector? or private enterprise?).tw.
8. or/4-7
9. Public Health Practice/
10. Public Sector/
11. Institutional Practice/
12. exp Hospitals, Public/

13. ((public adj3 practice?) or (institutional adj3 practice?) or public hospital? or public clinic? or public sector? or public health service?).tw.
14. or/9-13
15. 8 and 14
16. ((dual or double or multiple or several or secondary or additional or supplement*) adj (practice? or medical practice? or health practice? or health care practice? or healthcare practice? or praction*)).tw.
17. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 employment?).tw.
18. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 job?).tw.
19. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 career?).tw.
20. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 occupation?).tw.
21. ((dual or double or multiple or several or more than one or two or secondary or additional or supplement*) adj (workplace? or work place? or worksite? or work site?)).tw.
22. ((dual or double) adj working).tw.
23. ((dual or double or multiple or several or more than one or two or secondary or additional or supplement*) adj income?).tw.
24. moonlighting.tw.
25. or/16-24
26. exp Health Personnel/
27. (physician? or doctor? or practitioner? or clinician? or nurse? or nurs* assistant? or midwife or midwives or pharmacist? or physio-therapist? or occupational therapist? or dentist? or technician? or radiographer? or health manager? or health care manager? or healthcare manager? or clinical offiser? or medical personnel? or medical professional? or medical worker? or medical provider? or medical staff or health personnel? or health care personnel? or healthcare personnel? or health professional? or health care professional? or healthcare professional? or health worker? or health care worker? or healthcare worker? or health provider? or health care provider? or healthcare provider? or health staff or health care staff or healthcare staff).tw.
28. or/26-27
29. Health Policy/ or Government Regulation/ or Law Enforcement/ or Social Control, Formal/ or Jurisprudence/ or Contracts/ or Social Control, Informal/ or Policy Making/ or Public Policy/ or Organizational Policy/ or Politics/
30. (regulat* or requirement? or prohibit* or legal or illegal or restrict* or monitor* or control* or jurisprudence or legislat* or law? or act? or policy or policies or politics or reform* or system? or plan* or program* or strateg*).tw.
31. or/29-30
32. randomized controlled trial.pt.
33. random\$.tw.
34. intervention\$.tw.
35. control\$.tw.
36. evaluat\$.tw.
37. or/32-36
38. exp Animals/
39. Humans/
40. 38 not (38 and 39)
41. 37 not 40
42. 3 and 41
43. 15 and 28 and 31 and 41
44. 25 and 41
45. or/42-44

CENTRAL

- #1 MeSH descriptor Private Practice, this term only
- #2 MeSH descriptor Private Sector, this term only
- #3 MeSH descriptor Hospitals, Private explode all trees
- #4 (private NEAR/3 practi*) or (private NEXT hospital*) or (private NEXT clinic*) or (private NEXT sector*) or (private NEXT enterprise*):ti,ab
- #5 (#1 OR #2 OR #3 OR #4)
- #6 MeSH descriptor Public Health Practice, this term only
- #7 MeSH descriptor Public Sector, this term only
- #8 MeSH descriptor Institutional Practice, this term only

- #9 MeSH descriptor Hospitals, Public explode all trees
- #10 (public NEAR/3 practi*) or (institutional NEAR/3 practi*) or (public NEXT hospital*) or (public NEXT clinic*) or (public NEXT sector*) or (public NEXT health NEXT service*):ti,ab
- #11 (#6 OR #7 OR #8 OR #9 OR #10)
- #12 (#5 AND #11)
- #13 MeSH descriptor Health Personnel explode all trees
- #14 (physician* or doctor* or practitioner* or clinician* or nurse* or "nursing assistant" or "nursing assistants" or midwife or midwives or pharmacist* or physiotherapist* or "occupational therapist" or "occupational therapists" or dentist* or technician* or radiographer* or "health manager" or "health managers" or "health care manager" or "health care managers" or "healthcare manager" or "healthcare managers" or "clinical officer" or "clinical officers" or "medical personnel" or "medical personnels" or "medical professional" or "medical professionals" or "medical worker" or "medical workers" or "medical provider" or "medical providers" or "medical staff" or "health personnel" or "health personnels" or "health care personnel" or health care personnels" or "healthcare personnel" or "healthcare personnels" or "health professional" or health professionals" or "health care professional" or health care professionals" or "healthcare professional" or "healthcare professionals" or "health worker" or "health workers" or "health care worker" or "health care workers" or "healthcare worker" or "healthcare worker" or "health provider" or "health providers" or "health care provider" or "health care providers" or "healthcare provider" or "healthcare providers" or "health staff" or "health care staff" or "healthcare staff"):ti,ab
- #15 (#13 OR #14)
- #16 (#12 AND #15)
- #17 (dual or double or multiple or several or secondary or additional or supplement*) NEXT practi*:ti,ab
- #18 (dual or double or multiple or several or secondary or additional or supplement*) NEXT ("medical practice" or "medical practices" or "medical practise" or "medical practises"):ti,ab
- #19 (dual or double or multiple or several or secondary or additional or supplement*) NEXT ("health practice" or "health practices" or "health practise" or "health practises"):ti,ab
- #20 (dual or double or multiple or several or secondary or additional or supplement*) NEXT ("health care practice" or "health care practices" or "health care practise" or "health care practises"):ti,ab
- #21 (dual or double or multiple or several or secondary or additional or supplement*) NEXT ("healthcare practice" or "healthcare practices" or "healthcare practise" or "healthcare practises"):ti,ab
- #22 (dual or double or multiple or several or secondary or additional or supplement*) NEXT practition*:ti,ab
- #23 (dual or double or multiple or several or secondary or additional or supplement*) NEAR/3 employment*:ti,ab
- #24 (dual or double or multiple or several or secondary or additional or supplement*) NEAR/3 (job or jobs):ti,ab
- #25 (dual or double or multiple or several or secondary or additional or supplement*) NEAR/3 career*:ti,ab
- #26 (dual or double or multiple or several or secondary or additional or supplement*) NEAR/3 occupation*:ti,ab
- #27 (dual or double or multiple or several or "more than one" or two or secondary or additional or supplement*) NEXT work*:ti,ab
- #28 (dual or double or multiple or several or "more than one" or two or secondary or additional or supplement*) NEXT income*:ti,ab
- #29 moonlighting:ti,ab
- #30 (#17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29)
- #31 (#16 OR #30)

Social Science and Social Science Citation Index ISI web of Science

#3 #1 AND #2

#2 TS=(regulat* or requirement* or prohibit* or legal or illegal or restrict* or monitor* or jurisprudence or legislat* or law or laws or act or acts or policy or policies or politics or reform* or system or systems or plan or plans or program* or strateg* or government or governments or state or states or federal or authority or authorities or contract or contracts)

#1 TS=("dual practice" or "dual practices" or "dual job" or "dual jobs" or "dual occupation" or "dual occupations" or "dual career" or "dual careers" or "dual employment" or "dual employments" or "dual working" or moonlighting)

EMBASE

1. private practice/

2. private hospital/

3. ((private adj3 practice?) or private hospital? or private clinic? or private sector? or private enterprise?:tw.

4. or/1-3

5. public health service/

6. public hospital/

7. ((public adj3 practice?) or (institutional adj3 practice?) or public hospital? or public clinic? or public sector? or public health service?).tw.
8. or/5-7
9. 4 and 8
10. ((dual or double or multiple or several or secondary or additional or supplement*) adj (practice? or medical practice? or health practice? or health care practice? or healthcare practice? or praction*)).tw.
11. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 employment?).tw.
12. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 job?).tw.
13. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 career?).tw.
14. ((dual or double or multiple or several or secondary or additional or supplement*) adj3 occupation?).tw.
15. ((dual or double or multiple or several or more than one or two or secondary or additional or supplement*) adj (workplace? or work place? or worksite? or work site?)).tw.
16. ((dual or double) adj working).tw.
17. ((dual or double or multiple or several or more than one or two or secondary or additional or supplement*) adj income*).tw.
18. moonlighting.tw.
19. or/10-18
20. exp health care personnel/
21. (physician? or doctor? or practitioner? or clinician? or nurse? or nurs* assistant? or midwife or midwives or pharmacist? or physio-therapist? or occupational therapist? or dentist? or technician? or radiographer? or health manager? or health care manager? or healthcare manager? or clinical offiser? or medical personnel? or medical professional? or medical worker? or medical provider? or medical staff or health personnel? or health care personnel? or healthcare personnel? or health professional? or health care professional? or healthcare professional? or health worker? or health care worker? or healthcare worker? or health provider? or health care provider? or healthcare provider? or health staff or health care staff or healthcare staff).tw.
22. or/20-21
23. health care policy/ or government regulation/ or legal aspect/ or law enforcement/ or social control/ or jurisprudence/ or contract/ or policy/ or politics/
24. (regulat* or requirement? or prohibit* or legal or illegal or restrict* or monitor* or control* or jurisprudence or legislat* or law? or act? or policy or policies or politics or reform* or system? or plan* or program* or strateg*).tw.
25. or/23-24
26. randomized controlled trial/
27. (randomised or randomized).tw.
28. experiment\$.tw.
29. Time Series Analysis/
30. (time adj series).tw.
31. (pre test or pretest or post test or posttest).tw.
32. impact.tw.
33. intervention\$.tw.
34. chang\$.tw.
35. evaluat\$.tw.
36. effect?.tw.
37. compar\$.tw.
38. or/26-37
39. nonhuman/
40. 38 not 39
41. 9 and 22 and 25 and 40
42. 19 and 40
43. or/41-42

LILACS

[MH]"Health Personnel" or [MH]"Health Occupations" or [MH]"Health Manpower" or [MH]"Allied Health Occupations" or [MH]"Allied Health Personnel" [Words]

AND

[MH]"Job Satisfaction" or [MH]"Attitude of Health Personnel" or [MH]"Personnel Turnover" or ((employee and turnover) or (em-
pregado and reorganizaçã) or (empleado and (reorganizacion or recambio))) or (attrition or desgaste or perdida) [Words]

AND

CT COMPARATIVE STUDY or random\$ or intervention\$ or intervencion or intervençã or control\$ or evaluat\$ or avaliação or evaluacion [Words]

WHAT'S NEW

Last assessed as up-to-date: 9 June 2011.

Date	Event	Description
4 August 2011	Amended	LILACS search strategy added

HISTORY

Protocol first published: Issue 3, 2010

Review first published: Issue 7, 2011

CONTRIBUTIONS OF AUTHORS

SN Kiwanuka - was the lead author of the review

Christine Nalwadda - conducted screening of articles, extraction of data

Alison Kinengyere - conducted part of the literature search

E Rutebemberwa - participated in the drafting of the review

F Ssengooba - provided substantial input on the review draft

Olico-Okui - provided substantial input on the review draft

GW Pariyo - provided substantial input on the review

DECLARATIONS OF INTEREST

None known

INDEX TERMS

Medical Subject Headings (MeSH)

*Employment; *Health Personnel; Personnel Staffing and Scheduling; Public Sector

MeSH check words

Humans