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Addressing the human resource crisis: A case study of Cambodia's efforts to reduce maternal mortality (1980-2012)

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Cambodia, midwifery, human resources for health (HRH), maternal mortality, MDGs, human resource systems, health systems strengthening, post-conflict

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Abstract

Objective: To identify factors that have contributed to the systematic development of the Cambodian human resources for health (HRH) system with a focus on midwifery services in response to high maternal mortality in the context of fragile resource-constrained countries.

Design: Qualitative case study. Review of published and grey literature and in-depth interviews with key informants and stakeholders using an HRH system conceptual framework.

Setting and participants: Three rounds of interviews were conducted with a total of 49 senior and mid-level managers of the Ministries of Health (MoH) and Education, educational institutes, and development partners. The interviewees were identified through a snowball sampling technique.

Main outcome measures: Perceptions of key informants and stakeholders on their role and activities, results of their actions, and external influences on key midwifery issues and on the development of the Cambodian HRH system. Analyses of respondents' perceptions were supplemented by review of policy documents and reports, both those published and/or in the grey literature.

Results: The incremental development of the Cambodian HRH system since 2005 focused on the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services contributed to significant reduction of the maternal mortality ratio (MMR). Other contributing factors included improved mechanisms for decision-making and implementation; political commitment backed up with necessary resources; leadership from the top along with growing capacity of mid-level managers; increased MoH capacity to plan and coordinate; and supportive development partners in the context of a conducive external environment.

Conclusion: Lessons derived from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of ongoing capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies.

Article summary

Article focus

To identify factors that contributed to the systemic development of the Cambodian HRH system and to derive lessons for HRH system development in fragile resource-constrained countries.

Key messages

- Lessons derived from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of continuous capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies.
- The Cambodian HRH system has developed incrementally to improve the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services is likely to have contributed significantly to reducing the maternal mortality ratio (MMR).
- Other factors which contributed to MMR reduction included the development of effective mechanisms for decision-making and implementation; political commitment to reduce MMR and mobilize required resources; leadership from the top along with growing capacity of mid-level managers; increased MoH capacity to plan and coordinate; and supportive development partners within a conducive external environment.

Strengths and Limitations

Strengths

1. The thrust of this study is based on the logical flows and framework of the "House Model" developed and presented by the authors. While the "House Model" contains similar elements to the WHO HRH action framework, it includes additional components and functions of the HRH system which were not independently recognized within the WHO framework. The legal and regulatory framework, for example, are significant to the HRH system, and we have included them as important components of the conceptual framework. This study also place particular emphasis on the linkages between the core components and functions of HRH management (production-deployment-retention) and on different jurisdictions of the government (policy and planning, finance, legal). This draws attention to their interface with the

HRH system as well as requiring different types of government capacity. On-going refinements of such models are of value in understanding how systems function and can be strengthened.

2. The study insights have been derived from a number of rounds of interviews with key informants, subsequent in-depth analyses of interviews and relevant literature. This approach contributed to identifying and articulating the particular events pertaining to the development of midwifery. The interviews with MOH personnel in particular enabled detailed insights regarding the roles and actions of stakeholders, as well as of the consequences of such actions for the system. These insights underpinned the study team's interpretation of the events which took place and the factors which contributed to them, thus allowing a comprehensive story to be told.

Limitations

Interviews focused largely focused on the Ministry of Health (MoH) and did not explore the perspectives of other relevant ministries. This may lead to some degree of bias in descriptions of the main events concerning the MMR reductions.

Introduction

Poor health outcomes are often associated with a shortage and/or mal-distribution of health professionals. [1] However, piecemeal approaches that focus on any one issue while neglecting other aspects of the human resources for health (HRH) system, are ineffective, particularly in fragile countries where the health system, infrastructure and social services are under-developed.[2] Improving maternal, newborn and child health and reducing maternal mortality requires a comprehensive approach, involving competent and committed midwives to ensure 24-hour service delivery and a strong focus on equity of access to maternity care by skilled birth attendants. [3,4]

Cambodia has focused on HRH in the 'post'-conflict* period since the 1990's. Incremental efforts to scale up the quantity and quality of HRH focused on the production of midwives from 2000 and intensified after 2005. These efforts resulted in an increased number of midwives working at health centers and significant improvements in the coverage of maternal health services (Figures 1 and 2). Recent international analyses of maternal mortality highlight the significant improvements in Cambodia (Figure 2). [5,6] Despite financial constraints, Cambodian government health expenditure has steadily increased (Figure 3), reflecting national commitment and leadership. The "story behind this story" of achievement deserves to be analysed and documented.

This paper aims to;

a) present insights and evidence of the achievements resulting from the investment in midwives and the systems in which they operate;
b) describe and analyze the factors related to extending and supporting midwifery; and
c) assess the broader implications for HRH systems development, policy and practice.

Methods

* We use the term 'post'-conflict in recognition of the fact that in many such countries conflict continues in some areas or recurs.

Policy documents and reports, published and grey literature were reviewed and assessed in relation to a conceptual framework we developed and named the "House Model" (Figure 4).[2] This framework highlights 11 closely linked and interdependent elements of the HRH system. We examined the events and processes which contributed to and/or impeded the development of the HRH system, with an emphasis on the particular attention given to midwives as a key component of the strategy to address maternal and child health.

Data collection occurred in three complementary stages. The first and second rounds of interviews sought to describe HRH system development, issues and opportunities, and perspectives about the present and the future. The first focused on the role of stakeholders and their views on the present HRH system while the second enquired about HRH system development, future priorities and sustainability. A third round of interviews focused on midwifery in Cambodia since 1980 and explored key midwifery issues identified from both the literature and the earlier interviews, roles of stakeholders and external influences. The approach emphasized a strengths-based approach, seeking to identify and explore in greater detail the contributory rather than hindering factors.

In September 2011, the first series of interviews was conducted with 30 stakeholders (14 MoH, 1 non-health Ministry, 5 educational institutes, 2 professional councils, and 10 development partner agencies). The second set in June 2012 included 5 MoH personnel and 2 development partner agencies. The third round, in August 2012, included 12 stakeholders (9 MoH senior and middle-level managers, 2 development partner agencies). Key informants were identified through the earlier interviews and a snowball technique (Figure 4-1). Interviews were conducted in English by two researchers (KA and NF), however for four non-English speaking interviewees in the first interview, questions were asked through an interpreter in Khmer language.

Transcripts were analyzed through inductive coding performed separately by KA and NF using Nvivo 9. The two sets of coding were compared and combined into one after discussing the differences. Core concepts identified by the coding were discussed and refined by NF, KA, AZ and ArR. Key contributing factors were derived from concepts referring to each component of the "House Model". The emphasis on the positives and on MoH informants may be considered both a strength and weakness of our approach.

Findings

1. Chronology of HRH system development, focused on midwifery, until 2005 (Table 1)

Since very few health professionals survived the Khmer Rouge (1975-1979), Cambodia needed to reconstruct its health system to provide basic services and accelerate the production of health personnel.[7] The MoH standardized curricula for nursing and midwifery schools[8] but agencies working in the Thai-border refugee camps continued to produce health workers with varying abilities.[7]

From the 1990's the MoH started to develop institutional capacity, with international community support. In 1995, as part of the health sector reforms, the MoH established the Department of Human Resources Development (HRD, in charge of production and continuous education), the Personnel Department (PD, deployment and personnel management), and the National Maternal and Child Health Center (NMCHC, maternal and child health national programs).[7] Some core MoH staff were sent abroad to study public health with the support of development partners.

The MoH developed HRH policy with external technical assistance and formulated a health workforce plan, rationalized professional categories and shifted the focus from producing large numbers of basic health workers to ensuring availability of better qualified staff.[9] This change, influenced by the development partners resulted in the suspension of midwifery training between 1997 and 2003,[10] resulting in a 10% decrease in numbers. This hindered the capacity to attain staffing standards for midwives especially in rural areas[11] (Figure 1).

> *"...It was a big mistake, big, big mistake. I think at that time, the international standard was not consistent with the real situation of Cambodia." (MoH1)*

The shortage of midwives became apparent early in the 2000's.[11] The MoH responded quickly to address the shortage and accelerated production through a one-year primary midwife (PMW) course.[10] Following a situation analysis by HRD, the PMW course started in 2003 in four provinces. It was delivered by provincial health departments (PHDs) with provincial trainers, adapting arrangements from the 1980s, emphasizing

local recruitment, establishing workplace contracts and providing student allowances. [12]

Around the same time (2002) the First Health Strategic Plan (HSP1) 2003-2008 was formulated and provided MoH staff with clear direction for human resource development.

"[Formulation of] policy and health strategic plan was an achievement. Before [it was] not clear, no guidelines." (MoH7)

In 2005, given dissatisfaction with the quality of the PMW graduates, the MoH decided to shift the responsibility for training from the PHDs to the regional training institutes which were expected to offer better quality programs .[10,12]

In the process of expanding the sector-wide approach (SWAP), a group of development partners established a pooled fund as a new funding modality. [13] This modality provided MoH departments with more flexible and accessible micro-level budgeting based on their self-designed plans.

2. Key events in the evolution of a comprehensive approach to reducing maternal mortality and stakeholder perspectives on HRH issues (Table 1)

a. First Midwifery Forum (2005)

The high MMR (472 per 100,000 live births) identified through the Demographic and Health Survey (DHS) 2005 evoked major concerns[14] and propelled the MoH to take urgent action.

"Everyone woke up. All felt ashamed… We talked that we have to do something." (DP2)

The first Midwifery Forum convened in December 2005 was a high profile national event which promoted political commitment to systematically and comprehensively tackle maternal mortality.[15] Relevant stakeholders from the Deputy Prime Minister to field midwives were involved and represented every component of the HRH system (Figure 4-2). Final recommendations included concrete multi-dimensional and multi-sectoral interventions: increasing the number of midwives at health centers, motivating midwives through increasing salaries and performance incentives, improving

working and living conditions in rural areas, and supporting midwifery education and students. [15]

The top-level decision to reward performance for a live birth ('delivery incentive') at hospitals and health centers had a great impact on the reduction of MMR. The government-funded delivery incentive (US $15) was successfully implemented in 2007, and involved the provincial treasury and commune council. [16]

"Recommendations from the Forum were very positive and effective for reducing MMR. ....It was a starting point to promote midwives." (MoH1)

Stakeholder involvement was evident with contributions from development partners. The Secretary of State set the agenda, involved key stakeholders and engaged mid-level managers from MoH departments (HRD, PD, and NMCHC) in decision-making, drawing on relevant data.

b. High-level midwifery taskforce (HLMWTF)

Following the first national Midwifery Forum, a comprehensive situation analysis supported by development partners identified effective interventions in 2006.[17] This led to the development partners and Secretary of State establishing in 2007 a High Level Midwifery Taskforce chaired by the Secretary of State. This event can be seen as the beginning of a sustained systemic approach with participation of mid-level managers from departments for planning, production, deployment, and maternal health service delivery.[18] The strong leadership enhanced by delegation from the Health Minister promoted coordination with other ministries.

"...the terms of reference [of HLMWTF] ... [appeared] in the top-down form... [suddenly] one day, a notice of the TOR was put on the wall, delivered" (DP1)"

The HLMWTF developed a multi-year plan focusing both on quantity and quality of midwives and maternal health services.[19] Agreed objectives (increased coverage of midwifery services for the reduction of MMR) and a clear role for Taskforce members provided an opportunity for collaborative planning and implementation of strategic interventions. Monitoring indicators were reported to MoH and Annual Health Review meetings provided a platform for broad participation by development partners.[19] Within the Taskforce, the development partners contributed skills and knowledge and worked

closely with relevant MoH departments. Their Cambodian national staff played a role as mediators.

"We collaborate(d) with transparency and accountability [about our work] within a [specified] timeframe. So that our plan is not an ambitious plan but effective with limited resources. " (MoH5)

The mid-level managers facilitated consecutive implementation of effective interventions. (Figure 4-2)

"The advantage [of the HLMWTF] was that Directors of MoH departments actually met. There had not been many opportunities….Without having communication, each department…acted inconsistently…like a typical Cambodian way (DP1)

c. Fast track initiative

The Second Health Strategic Plan (HSP2) 2008-2015 was developed in 2008.[20] The MoH contributed much more actively than to earlier efforts, which had been donor-driven. The strategy prioritized midwifery including staffing at health facilities, revision of training content, increasing student intake, raising the quality of training and trainers, and salary reform.[20]

In 2008, the new Health Minister declared a "Fast track initiative to reduce maternal and newborn mortality" with a target of "midwives in all health centers". It signaled strong leadership from the top, reinforcing the high level commitment seen earlier. Mid-level managers including provincial officials were committed to reaching the target. [21] Through reallocation of midwives from hospitals to health centers, [22] and accelerated production and deployment, the target of ensuring 24-hour delivery service in all health centers was achieved by having at least one midwife in 2009, although 463 health centers (48%) had only PMWs present (Figure1).

"Slogan [Place midwives in all health centers] is easy to understand for everyone."(DP1)

In 2009, a second midwifery forum reviewed progress. [23] The Forum itself was becoming routine, no longer a tool for innovation in tackling midwifery issues.

d. Reproductive, maternal, newborn and child health taskforce (RMNCHTF)

The RMNCH taskforce was created in 2009 as one of four taskforces under the HSP2. Unlike the HLMWTF, midwifery issues were integrated into the broader RMNCH issues. A mid-level manager with long-time career and field experience developed the terms of reference and served as chair. Taskforce members were drawn from across the MoH, development partners, and NGOs.

This Taskforce identified priority areas and interventions, mobilized financial resources, guided implementation and provided an enabling environment.[24] The Taskforce institutionalized collaboration within the MoH and offered a roadmap for the Fast Track Initiatives. [24]

e. Mid Term Review of the Health Workforce Development Plan 2006-2015

The MoH requested development partners, to facilitate the review of the Health Workforce Development Plan 2006-2015. The Minister of Health established a Human Resource for Health Committee to initially guide the Review and then oversee implementation of its recommendations. The HRH Committee comprised the Human Resource and MCH leaders and was chaired by the same Secretary of State as the HLMWTF. [25]

f. Stakeholder perspectives on current and future HRH issues

Stakeholder views of HRH issues were consistent with those in MoH reports.[25] Future concerns included the quality of production; regulation of private institutions; retention in rural areas; the shortage of capable staff at MoH; and the sustainability of development partner support. Recognition of the issues and their causes were shared by many stakeholders, potentially reflecting MoH communication.

3. Factors contributing to increasing the coverage of midwifery services

a. Comprehensive approach to decision making and effective implementation

A comprehensive approach covering all components of the HRH system framework ("House Model") and involving necessary stakeholders inside and outside the MoH, both at central and peripheral levels, promoted midwifery services. These contributed to the achievement of quantitative and qualitative HRH targets although interventions were primarily related to the supply side. The HLMWTF was seen as a successful platform

and provided a venue for open-discussion, planning and implementation of strategic interventions. Held in a culturally appropriate setting, this prioritized activities with synergistic effects given the resource-limitations. The Taskforce presented a coherent voice to the outside. MoH applied this model and experience to the working of the RMNCH Taskforce in the area of RMNCH services and Human Resource for Health Committee in HRH system development.

"HRD produce, PD absorb, and NMCHC support and monitor in-service training. A comprehensive and continuous process. We improved step by step. Like a spiral, I think we can call it 'spiral improvement'." (MOH4)

b. Political commitment to address high MMR

Political commitment was strong, at a high level, and continuous. Key factors for the success in obtaining such commitment were lobbying by the MoH leadership using survey and other data.[14,26] Development partners which were influential to the core ministries increased awareness of the growing political commitment.

"It (involvement of other ministries) did not happen before, but I think, the idea for promoting midwives existed in the Council of Administrative Reform, Secretary of Public Function, and Deputy Prime Minister. So we could involve them." (MoH1)

Delivering it, as a clear slogan in the Fast track Initiative ("Place midwives in all health centers") accelerated this strategic intervention. [24]

c. Leadership from the top for decision-making and effective implementation

Strong top-down leadership is acceptable in Cambodia and is taken seriously by subordinates. A capable and experienced Secretary of State negotiated and coordinated with stakeholders including other ministries, mobilized resources, and monitored activities carefully. He created, chaired, and led HLMWTF. The Secretary's position and high capacity for the donor coordination had been effective.

"We need someone strong, behind the scene, and [who can] work for long time." (MoH4)

"...MCH Sub COCOM (Coordination Committee) in 1992 or 1993. I was the chair. .. there was a rumor that I became crazy with lots of development partners…

We have a proverb in Khmer, "two cows at the same time, many cows at the same time, we need to gather them". So I did. I need to respect (my) role of coordinator, not blame development partners, but create coordination." (MoH1)

d. "Staff behind the scene": Growing capacity and confidence of mid-level individual managers

The mid-level managers comprised the right persons from necessary departments who had knowledge and experience of practice and evidence-based decision-making and monitoring; substantial experience in the MoH; and working experience with development partners. These mid-level managers, often responsible for technical aspects of programming, prepared the data and documentation that assisted the lobbying and negotiations of the senior MoH leaders.

"Not only people at high positions, but people behind the scene are important…the people at the departments who prepare documents are important, they work as a team." (MoH4)

e. Increased MOH capacity in planning and coordination

Throughout the processes studied, we found evidence of increasing capacity of MoH departments in planning and coordination. For example, the HRD reviewed the quality of PMW production and immediately revised the production mechanisms.[12] The PD collaborated with other ministries and implemented smoothly and strategically the recruitment, deployment and increased salary scale of midwives.[16] In addition, the Cambodian MoH increased its capacity as demonstrated by its role in formulating HSP2 and establishing the RMNCH Taskforce. This increased MoH capacity facilitated policy implementation around midwifery.

Improved quality of MoH data through the introduction of a workforce projection tool, convinced the Council of Ministers to give special treatment to the MoH which increased civil servant allocations to the MoH by 58% annually for the last two years (Figure1). While not specifically for midwives, many of the positions allocated have been for midwifery; remarkable given that Cambodian government administrative reforms have led to a reduction in civil servant positions overall (Figure1).

f. Supportive development partners took actions for human resource crisis and MDG goal

The development partners continued to offer technical and financial support. In addition, they brought new perspectives through working closely with MoH departments for a sustained period. These contributed to capacity development of the MoH and are particularly important in 'post'-conflict and fragile states where resources are so limited. These partners were able to draw on their national staff to integrate external perspectives with understanding of the cultural and political sensitivities present.

g. External environment surrounding the health sector

Rapid changes in the external environment after 2000 were also favorable to the health sector in Cambodia. Due to the political stability and security, Cambodia enjoyed economic growth with dramatic improvements in infrastructure, communication, transportation, and the educational level of community members. These improvements facilitated the recruitment of PMW and deployment and retention in remote health centers, which in turn promoted broader HRH system development.

> *"In the late 90's, only for 40km it took all morning. Now we have clean health facilities,…. Start(ed) production (in 2003),…when they (the students) graduate(d) and start(ed) working, infrastructure was improved. Timing was perfect." (DP2)*

Discussion

The Cambodian case is encouraging although the degree of political stability over the last decade is uncharacteristic for 'post'-conflict countries. A comprehensive and systemic approach focused on midwifery consolidated efforts and rapidly achieved the goal of implementing effective interventions to reduce MMR; this built on the incremental development of the health and HRH systems underpinned by economic growth. A similar comprehensive and systemic approach in Liberia, another 'post'-conflict state, focused on nurses and proved to be effective in expanding service coverage.[27]

Cambodian Taskforces strengthened coordination at the decision-making level and collaboration at the implementation level. The approach enhanced linkages between the components of the "House Model" contributing to HRH system development. Ongoing HRH system development and those focused on midwives reinforced one another. The high level political commitment to promote achievement of the MDGs

propelled the system by ensuring resource availability and more speedy decision-making, documented also in a Sierra Leonian case study. [28]

Even when a comprehensive approach is taken, a narrow focus on one cadre (in this case midwives) brought advantages for rapid resource mobilization, but risked delaying attention and efforts to addressing other issues. This may undermine the needed systemic HRH development. Monitoring progress and adjusting decisions accordingly may help shift the focus as needed for future priorities.

In Cambodia the Secretary of State played a significant role in establishing appropriate fora, committees, taskforces, and initiatives to ensure a systemic and integrated approach. The low turnover of mid-level managers reinforced and further built-up their capacity and sustained momentum for system development. Team-work linked managers and leadership to push forward processes. The importance of capable senior leadership and mid-level managers working together deserves more attention. Increasing the institutional capacity and resources of MoH departments creates and builds the basis for systemic changes, although this is often neglected. Institutionalizing and reinforcing a comprehensive approach, through regular stakeholder engagement and other measures, warrant further attention.

HRH system development in 'post'-conflict countries takes decades, and needs consistent long-term support at every level of the health system. Such support is more feasible where critical reflections on the HRH system development have occurred and good capacity exists for MoH personnel to drive HRH system change and development. Donor-driven development is often pervasive in such countries, resulting in fragmented, short-sighted and often contradictory policies and interventions, as seen in the earlier disruption of midwife training in Cambodia.

Conclusion

This study examines and documents the key events and underlying factors which contributed to an emphasis on midwifery as part of the response to high maternal mortality, and simultaneously to building the HRH system. The well-focused and integrated approach was central to Cambodian achievements. Increased MoH capacity, both at organizational and individual levels, also contributed. Capable senior and

mid-level managers are vital for HRH system development, especially in 'post'-conflict countries. The systemic approach adopted could well be applied to other existing and emerging issues.

In Cambodia and elsewhere, the HRH systems approach needs to be complemented by consolidating sustainability. Studies of HRH system experiences are little documented but valuable. Such critical but constructive debate offers useful insights for HRH system development.

Competing interests

We declare that we have no competing interests.

Author's contribution

NF and KA reviewed literature, designed and conducted interviews, analyzed the results and wrote the first draft. AZ and ArR contributed to the design, conceptualization, methods, analysis and writing. RT and PK contributed to the literature review and preparation of chronology. AnR contributed to the draft revision. All authors reviewed and agreed with the final version of the paper.

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Ethical consideration

This study was approved by the Ethical Committee of National Center for Global Health and Medicine, Japan, and by that of the Ministry of Health, Cambodia.

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Table1: Evolution and chronology of health system, human resource system, and midwifery-related issues in Cambodia (1946-2012)

Year	Health and human resource system development	Midwifery-related issues
1946	First modern school of health professionals in Cambodia established in Phnom Penh.[8]	
1953	National Independence: Sihanouk regime Royal school for Medicine established; commenced education of medical doctors and health officers.[8]	
1961	Royal school for Nurses and Midwives created under the MoH.[8]	Two levels of nurses and midwives trained (State Nurse and State Midwife, Auxiliary Nurse and Rural Midwife).[8]
1970	Lon Nol regime (1970-75) Political instability. Educational programs became irregular. [8]	
1975-79	Khmer Rouge regime Genocide and destruction of institutions; educational system changed as 2 categories of health professionals trained at hospitals.[8]	
1979	Vietnamese-led liberation. State of Cambodia Rebuilding the state along the lines of the Vietnamese health system.[7,8]	Provincial Training center set up, provided 6-month training of Primary Nurse and Primary Midwife working at primary level health facilities or health centers, without standardized curriculum. [8]
1980		Technical school for medical care (TSMC) established in Phnom Penh; provided training for nurse/midwife and allied health personnel; Besides Primary level, Secondary Nurse and Secondary Midwife training, for hospital-based work, started at TSMC. [8]
1987		All provincial training centers absorbed into 4 Regional Training Centers (RTCs); these provided training of nurses and midwives both at primary and secondary level with standardized curriculum. [8]

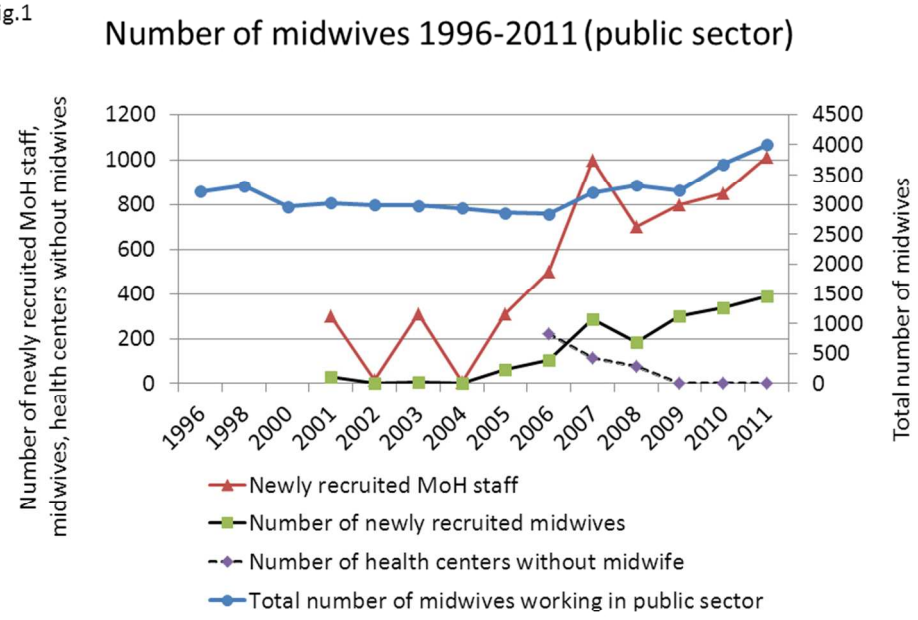
1989		Primary nurse and midwife course ended (academic year 1987/1989). [8]
1991		Bridging course from Primary level to Secondary level started and continued until 2001.[8]
1991	Paris Peace Accord and UN Transitional Authority in Cambodia (UNTAC)	
1993	First General Election – First Mandate (1993-1998) Health workforce survey (by MoH and WHO) revealed overwhelming number of workers of varying abilities, unregistered and without career structure.[7] Coordination Committee (COCOM) established as a coordination mechanism with development partners, NGOs and MoH at central and provincial level with subcommittees (Sub COCOM) according to technical areas.[7]	
1995	Health Coverage Plan (Health sector reform)	
1996	Human resources development policy and health workforce plan (1996-2005) Rationalization of 59 categories of health workers trained; MoH sought to rationalize these into 29 equivalents.[7]	Secondary Midwife course ended; no production of new midwives until 2003, both primary and secondary level. [10]
1998	Second General Election – Second Mandate (1998-2003)	
2000	Health workforce plan, midterm review [11]	Midterm review identified alarming shortage of midwives. [11]
2002		Diploma of Nursing and Midwifery (3 year nursing + 1 year midwife) (3+1 course) started at TSMC and RTC. [10]
2003	Third Mandate (2003-2008) Health Strategic Plan I (2003-2008)	Stakeholders' meeting, organized by MoH/HRD, decided 3+1 course and primary midwife course as a strategy to address the shortage of midwives.[10] Few candidates applied to 3+1 course because of little advantage of attending 1 more year to become midwife. [10] Primary nurse/midwife (1 year, direct entry) course started in remote north east region by provincial health departments (PHD) and provincial trainers along

		with local recruitment and deployment mechanism.[12]
2004		Survey result revealed "Not enough skilled midwives, poor working environment and little motivation, girls do not want to be midwives" .[26]
2005	Health Sector Support Project (pooled fund mechanism) started [13]	Demographic and Health Survey 2005 revealed MMR of 472 per 100,000 live births; very high and little changed over time; evokes major concern within MoH.[14] Primary midwife/nurse course shifted from PHD to RTCs and covers whole country because of the unsatisfactory quality of training at PHD, local recruitment and deployment system continued. [10] First Midwifery Forum (Dec 2005) [15]
2006	Health Workforce Development Plan 2006-2015	Comprehensive midwifery review identified the target number of midwives to reduce MMR. [17] UNFPA provided stipend for 3+1 course students until Associated degree of MW (3 years course) started in 2008 (personal communication; UNFPA program manager)
2007		High Level Midwifery Taskforce established and developed a multi-year plan. [18,19] Live-birth incentives for health centers and referral hospitals [16] ,associated with MW recruitment and improved salary scale[29]
2008	Fourth Mandate (2008-2013) Health Strategic Plan II (2008-2015)	The strategy prioritized midwifery, with target of staffing level at health facilities, revision of training content, increased student intake, quality of training and trainers, and salary reform. [20] New Health Minister declares "Fast track initiatives to reduce maternal and newborn mortality" with a target of "midwives in all health centers".

		Midwifery deployment task force established at MOH to prepare strategies to reallocate midwives to meet the target. [21,22]
2009	Reproductive, Maternal, Newborn and Child Health (RMNCH) Taskforce established to fast track initiatives to reduce maternal and newborn mortality as one of four taskforces under Health Strategic Plan 2 (2008-2015)	Achieved "Midwives in all health centers", but around 60% of health centers only have primary midwives. Second Midwifery Forum [23]
2010	RMNCH taskforce prepared roadmap for the Fast track initiatives to identify priority areas and interventions, mobilize financial support, identify policy issues and guide implementing units of MoH [24]	Delivery incentives continued New monitoring indicators set up (At least two midwives in all health centers, of which one is secondary midwife). [24]
2011	Health Workforce Development Plan 2006-2015, midterm review[25]	Demographic Health Survey 2010 revealed MMR reduction (206 per 100,000 live births) [6]

References as per reference number

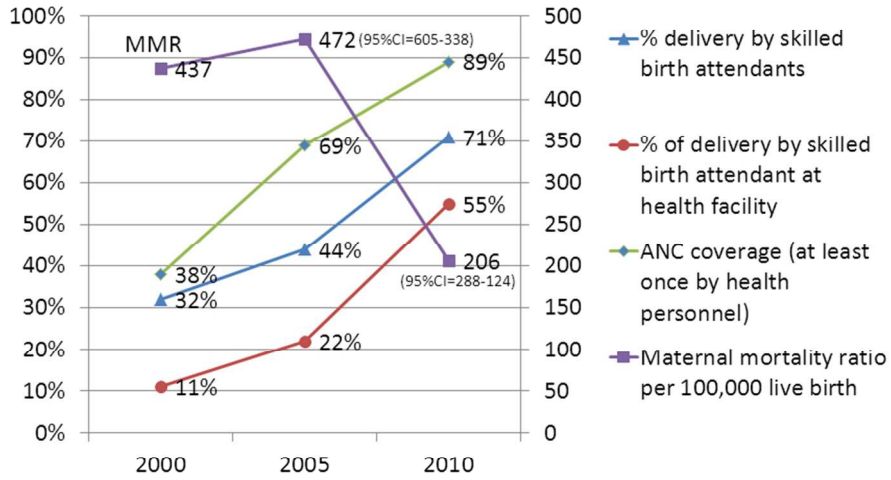
Fig.1



Data source: Personnel Department, MOH, Cambodia

254x190mm (96 x 96 DPI)

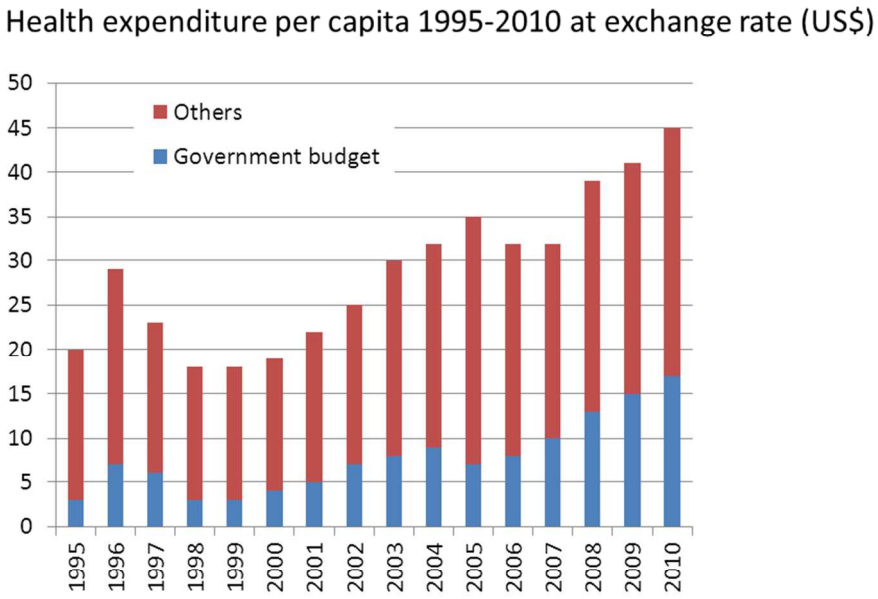
Fig.2 Coverage of maternal health services and maternal mortality ratio(MMR)



Data source: Cambodia Demographic and Health Survey 2000, 2005, 2010

254x190mm (96 x 96 DPI)

Fig.3



Data source: World Health Organization (WHO). 2011. Cambodia National Health Accounts. http://www.who.int/nha/country/khm/en/

254x190mm (96 x 96 DPI)

Fig 4-1 Stakeholder mapping (House model)

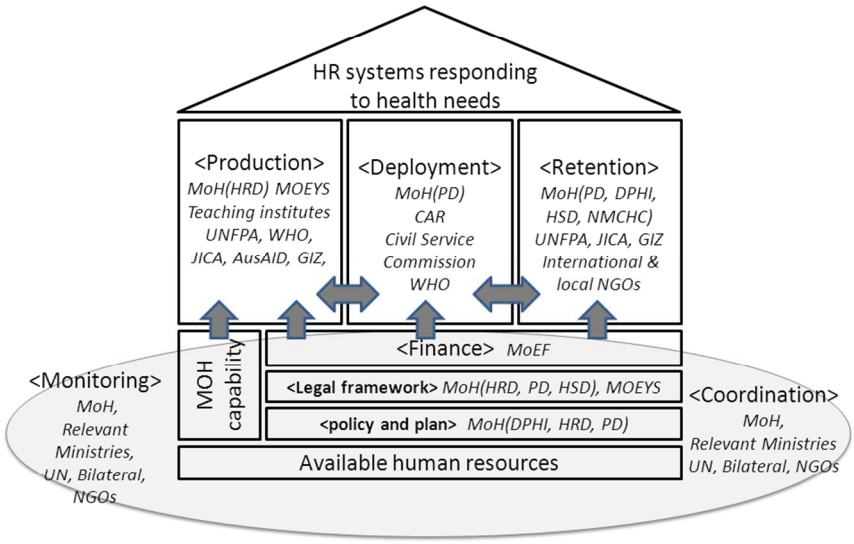
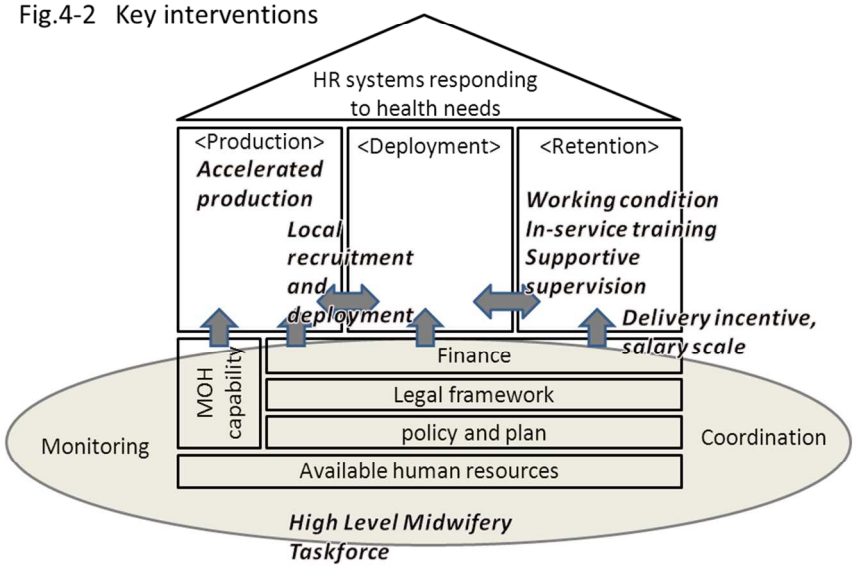


Fig.4-2 Key interventions



266x355mm (96 x 96 DPI)

Figure 4. Acronym

Aus AID: Australian Agency for International Development

CAR: Council for Administrative Reform

DPHI: Department of Planning and Health Information, Ministry of Health

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

HRD: Human Resource Development Department, Ministry of Health

HSD: Hospital Service Department, Ministry of Health

MOEYS: Ministry of Education, Youth and Sport

MOEF: Ministry of Economy and Finance

MOH: Ministry of Health

NGO: Non-governmental Organization

NMCHC: National Maternal and Child Health Center

PD: Personnel Department, Ministry of Health

JICA: Japan International Cooperation Agency

UN: United Nations

UNFPA: United Nations Population Fund

WHO: World Health Organization

Addressing the human resource crisis: A case study of Cambodia's efforts to reduce maternal mortality (1980-2012)

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Addressing the human resource crisis: A case study of Cambodia's efforts to reduce maternal mortality (1980-2012)

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Keywords
Cambodia, midwifery, human resources for health (HRH), maternal mortality, MDGs, human resource systems, health systems strengthening, post-conflict

Word count 4450

Abstract

Objective: To identify factors that have contributed to the systematic development of the Cambodian human resources for health (HRH) system with a focus on midwifery services in response to high maternal mortality in fragile resource-constrained countries.

Design: Qualitative case study. Review of published and grey literature and in-depth interviews with key informants and stakeholders using an HRH system conceptual framework developed by the authors ('House Model'; Fujita et al, 2011). Interviews focused on the perceptions of respondents regarding their contributions to strengthening midwifery services and the other external influences which may have influenced the HRH system and reduction in the maternal mortality ratio (MMR).

Setting and participants: Three rounds of interviews were conducted with a total of 49 senior and mid-level managers of the Ministries of Health (MoH) and Education, educational institutes and development partners. The interviewees were identified through a snowball sampling technique.

Main outcome measures: Scaling up the availability of 24-hour maternal health services at all health centers contributing to MMR reduction.

Results: The incremental development of the Cambodian HRH system since 2005 focused on the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services contributed to significant MMR reduction. Other contributing factors included improved mechanisms for decision-making and implementation; political commitment backed up with necessary resources; leadership from the top along with growing capacity of mid-level managers; increased MoH capacity to plan and coordinate; and supportive development partners in the context of a conducive external environment.

Conclusion: Lessons from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of ongoing capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies.

Article summary

Article focus

To identify factors that contributed to the systemic development of the Cambodian human resources for health (HRH) system and to derive lessons for HRH system development in fragile resource-constrained countries.

Key messages

- Lessons derived from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of continuous capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies. A conceptual framework "House Model" (Fujita et al, 2011) developed by the authors formed the backbone for assessing the key variables that impact on the HRH system and the dynamic interrelationships between them.
- The Cambodian HRH system has developed incrementally to improve the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services is likely to have contributed significantly to reducing the maternal mortality ratio (MMR).
- Other factors which contributed to MMR reduction included the development of effective mechanisms for decision-making and implementation; political commitment to reduce MMR and mobilize required resources; leadership from the top along with growing capacity of mid-level managers; increased Ministry of Health (MoH) capacity to plan and coordinate; and supportive development partners within a conducive external environment.

Strengths and Limitations

1. The thrust of this study is based on the logical flows and framework of the "House Model" developed and presented by the authors (Fujita et al, 2011). This study also places particular emphasis on the linkages between the core components and functions of HRH management and on the different jurisdictions of the government. This draws attention to their interface with the HRH system and the requirement for a variety of types of government capacity. On-going refinements to such models are of value in fine-tuning our understanding of how systems function and can be strengthened.

2. Study insights were derived from three rounds of interviews with key informants, in-depth analyses of these interviews and associated relevant literature. This approach contributed to identifying and articulating the particular events pertaining to the development of midwifery in Cambodia. The interviews with MOH personnel in particular enabled detailed insights regarding the roles and actions of stakeholders, as well as of the consequences of these actions for the system. These insights underpinned the study team's interpretation of the events which took place and the factors which contributed to them, thus allowing a comprehensive story to be told.

3. Interviews focused largely on the Ministry of Health (MoH) and did not explore the perspectives of other relevant ministries. This may have contributed to a degree of bias in describing the main events contributing to MMR reductions. The perspectives of provincial and district authorities and midwives were beyond the scope of this study as was a detailed exploration of any unintended negative consequences of the policies and processes described and their impact on day to day performance and the ability to provide quality services. These merit further exploration.

Introduction

Poor health outcomes are often associated with a shortage and/or mal-distribution of health professionals. [1] Piecemeal approaches to human resources for health (HRH) that focus on one issue, such as production or deployment, while neglecting other aspects of the HRH system are ineffective, particularly in fragile countries where the health system, infrastructure and social services are under-developed.[2] Improving maternal, newborn and child health and reducing maternal mortality requires a comprehensive approach, involving competent and committed midwives to ensure 24-hour service delivery and a strong focus on equity of access to maternity care by skilled birth attendant. [3,4]

Cambodia has been identified as one of the poorest countries in South East Asia. Most (80%) of the population of 13.4 million lived in rural areas in 2008. [5] The health status of Cambodians ranked low compared to other countries in the Region; the infant mortality rate was assessed in 2010 as 45 per 1,000 live births and maternal mortality ratio as 206 per 100,000 live births. [6]

Midwives in Cambodia are the main workforce dealing with reproductive, maternal and newborn care in hospitals and health centers. Their work includes basic emergency obstetric care as defined in the standard package of activities for each level of facilities. [7] The midwives are classified in two categories (primary and secondary) according to the duration of professional education. Although both work at all levels of the health system, the original intention was that primary midwives would work at health centers and in a supportive role to secondary midwives.[7]

Cambodia has focused on HRH in the 'post'-conflict* period since the 1990's. Incremental efforts to scale up the quantity and quality of HRH focused on the production of midwives from 2000 and intensified production of both primary and secondary midwifes after 2005. These efforts resulted in an increased number of midwives working at health centers and significant improvements in the coverage of maternal health services (Figures 1 and 2). Recent international analyses of maternal

* We use the term 'post'-conflict in recognition of the fact that in many such countries conflict continues in some areas or recurs. [28]

mortality highlight the significant improvements in Cambodia (Figure 2). [6,8] Despite financial constraints, Cambodian government health expenditure has steadily increased (Figure 3), reflecting national commitment and leadership. The "story behind this story" (ABZ) of achievement deserves to be analyzed and documented.

This paper aims to;

a) present insights and evidence of the achievements resulting from the investment in midwives and the systems in which they operate;
b) describe and analyze the factors related to extending and supporting midwifery; and
c) assess the broader implications for HRH systems development, policy and practice.

Methods

Policy documents and reports, both in published and grey literature in four languages (English, Khmer, Japanese, and French) were reviewed and data base were searched (PubMed and Science Direct) with key words (Cambodia, midwife, midwifery health system, health workers, HRH, and words similar to these words). The literature identified through these searches was assessed by all authors with reference to the "House Model" (Figure 4) [2] which highlights 11 closely linked and interdependent elements of the HRH system. It includes additional components and functions of the HRH system which were not independently recognized within the WHO framework but which appear significant in light of this study, including the legal and regulatory framework. We examined the events and processes which contributed to and/or impeded the development of the HRH system, with an emphasis on the particular attention given to midwives as a key component of the strategy to address maternal and child health (MCH).

The decision to conduct interviews with individual stakeholders rather than groups was based on consideration of cultural context and the readiness of stakeholders to offer critical views of their superiors and their organizations. Data collection occurred in three complementary stages. The first and second rounds of interviews sought to describe HRH system development, issues and opportunities. The first focused more on the role of stakeholders and their views on the present HRH system while the second enquired about HRH system development, future priorities and sustainability. A third

round of interviews focused on midwifery in Cambodia since 1980 and explored key midwifery issues identified from both the literature and the earlier interviews, with a focus on the roles of stakeholders and external influences. The approach emphasized a strengths-based approach, seeking to identify and explore in greater detail those factors which contributed to, rather than hindered, system development.

In September 2011, the first series of interviews was conducted with 30 stakeholders (14 Ministry of Health (MoH), 1 non-health Ministry, 5 educational institutes, 2 professional councils, and 10 development partner agencies). The second set in June 2012 included 5 MoH personnel and 2 development partner agencies. The third round, in August 2012, included 12 stakeholders (9 MoH senior and middle-level managers, 2 development partner agencies). Key informants were identified through the earlier interviews and a snowball technique (Figure 4-1). The first two rounds of interviews identified the strong top-down approach to decision-making (illustrated in findings below) that limited the participation in decision-making and policy-making to a narrow range. As a result, the key informants in the third round of interviews were those working for the MoH and development partners despite seeking, through snowball sampling, to widen the identification of those participating in these processes. Educational institutions had limited participation and influence in the policy and decision making processes and the professional councils also had limited influence as they were in early stages of development.

Interviews were conducted in English by two researchers (KA and NF), who had working experiences in health technical cooperation projects and health studies in the country over a decade. An interpreter assisted with four non-English speaking interviewees in the first round of interviews.

Transcripts were analyzed through inductive coding performed separately by KA and NF using Nvivo 9. The two sets of coding were compared and combined after discussing any differences. Core concepts were discussed and refined in consultation with ABZ and ArR. Key contributing factors were derived from concepts referring to each component and linkages between the core components of the “House Model” and different jurisdictions of the government (policy and planning, finance, legal). The linkages incorporate HRH management (production-deployment-retention)

Findings

In this section, we first present the chronology of HRH system development (Table 1) focusing on midwifery issues from 1980 onward, corresponding to the period covered by this study. The chronology (Table 1) draws in new findings from the archival review which took 1946 as the start-date. We present key events in the evolution of a more comprehensive approach to reducing maternal mortality and which covers the components of the House Model. We also present stakeholder perspectives on HRH issues and identify those factors which contributed to increases in midwifery service coverage.

1. Chronology of HRH system development, focused on midwifery since 1980 until 2005 (Table 1)

The following sub-sections depict chronologically the main issues, responses and developments concerning HRH in midwifery (1980-2005). The areas covered include policies and plans, production, deployment, and retention, organizations, and partnership with development partners.

a. Accelerated production after the Khmer Rouge genocide

Since very few health professionals survived the Khmer Rouge (1975-1979), Cambodia needed to reconstruct its health system to provide basic services and accelerate the production of health personnel.[9] The MoH standardized curricula for nursing and midwifery schools for two types of midwife: primary and secondary. [10] Agencies working in the Thai-border refugee camps continued to produce health workers with varying abilities.[9]

b. Development of MoH institutional capacity and organizational evolution for HRH

From the 1990's the MoH started to develop institutional capacity, with international community support. In 1995, as part of the health sector reforms, the MoH established the Department of Human Resources Development (HRD, in charge of production and continuous education), the Personnel Department (PD, deployment and personnel management), and the National Maternal and Child Health Center (NMCHC, maternal and child health national programs).[9] Some core MoH staff were sent abroad to study public health with the support of development partners.

c. Policies and Plans: shifting from quantity to quality, suspension of production of midwives

The MoH developed HRH policy with external technical assistance and formulated a health workforce plan, rationalized professional categories and shifted the focus from producing large numbers of basic health workers to ensuring availability of better qualified staff.[11] This change, influenced by the development partners resulted in the suspension of midwifery training between 1997 and 2003,[12] resulting in a 10% decrease in numbers. This hindered the capacity to attain staffing standards for midwives especially in rural areas[13] (Figure 1).

"...It was a big mistake, big, big mistake. I think at that time, the international standard was not consistent with the real situation of Cambodia." (MoH1)

d. Accelerated production to respond to acute shortages

The shortage of midwives became apparent early in the 2000's.[13] The MoH responded promptly to address the shortage and accelerated production through a one-year primary midwife (PMW) course.[12] Following a situation analysis by HRD, the PMW course started in 2003 in four provinces. It was delivered by provincial health departments (PHDs) with provincial trainers, adapting arrangements from the 1980s, emphasizing local recruitment, establishing workplace contracts and providing student allowances.[14]

Around the same time (2002) the First Health Strategic Plan (HSP1) 2003-2008 was formulated and provided MoH staff with clear direction for human resource development.

"[Formulation of] policy and health strategic plan was an achievement. Before [it was] not clear, no guidelines." (MoH7)

In 2005, given dissatisfaction with the quality of the PMW graduates, the MoH decided to shift the responsibility for training from the PHDs to the regional training institutes that were expected to offer better quality programs .[12,14]

e. Changes associated with partnership with development partners

In the process of expanding the sector-wide approach (SWAP), a group of development partners established a pooled fund as a new funding modality.[15] This modality provided MoH departments with more flexible and accessible micro-level budgeting based on

their self-designed plans.

2. Key events in the evolution of a comprehensive approach to reducing maternal mortality and stakeholder perspectives on HRH issues (Table 1)

a. First Midwifery Forum (2005)

The high MMR (472 per 100,000 live births) identified through the Demographic and Health Survey (DHS) 2005 evoked major concerns[16] and propelled the MoH to take urgent action.

> *"Everyone woke up. All felt ashamed… We talked that we have to do something." (DP2)*

The first Midwifery Forum convened in December 2005 was a high profile national event which promoted political commitment to systematically and comprehensively tackle maternal mortality.[17] Relevant stakeholders from the Deputy Prime Minister to field midwives were involved and represented every component of the HRH system (Figure 4-2). Final recommendations included concrete multi-dimensional and multi-sectoral interventions: increasing the number of midwives at health centers, motivating midwives through increasing salaries and performance incentives, improving working and living conditions in rural areas, and supporting midwifery education and students. [17]

The top-level decision to reward performance for a live birth ('delivery incentive') at hospitals and health centers had a great impact on the reduction of MMR. The government-funded delivery incentive (US $10-15) was successfully implemented in 2007, and involved the provincial treasury and commune council. [18]

> *"Recommendations from the Forum were very positive and effective for reducing MMR. ….It was a starting point to promote midwives." (MoH1)*

Stakeholder involvement was evident with contributions from development partners. The Secretary of State set the agenda, involved key stakeholders and engaged mid-level managers from MoH departments (HRD, PD, and NMCHC) in decision-making, drawing on relevant data.

b. High-level midwifery taskforce (HLMWTF)

Following the first national Midwifery Forum, a comprehensive situation analysis supported by development partners identified effective interventions in 2006.[7] This led to the development partners and Secretary of State establishing in 2007 a High Level Midwifery Taskforce chaired by the Secretary of State. This event can be seen as the beginning of a sustained systemic approach with participation of mid-level managers from departments for planning, production, deployment, and maternal health service delivery.[19] The strong leadership enhanced by delegation from the Health Minister promoted coordination with other ministries.

"...the terms of reference [of HLMWTF] ... [appeared] in the top-down form... [suddenly] one day, a notice of the TOR was put on the wall, delivered" (DP1)"

The HLMWTF developed a multi-year plan focusing both on quantity and quality of midwives and maternal health services.[20] Agreed objectives (increased coverage of midwifery services for the reduction of MMR) and a clear role for Taskforce members provided an opportunity for collaborative planning and implementation of strategic interventions. Monitoring indicators were reported to MoH and Annual Health Review meetings provided a platform for broad participation by development partners.[20] Within the Taskforce, the development partners contributed skills and knowledge and worked closely with relevant MoH departments. Their Cambodian national staff played a role as mediators.

"We collaborate(d) with transparency and accountability [about our work] within a [specified] timeframe. So that our plan is not an ambitious plan but effective with limited resources. " (MoH5)

The mid-level managers facilitated consecutive implementation of effective interventions. (Figure 4-2)

"The advantage [of the HLMWTF] was that Directors of MoH departments actually met. There had not been many opportunities….Without having communication, each department…acted inconsistently…like a typical Cambodian way (DP1)

c. Fast track initiative

The Second Health Strategic Plan (HSP2) 2008-2015 was developed in 2008.[21] The

MoH contributed much more actively than to earlier efforts, which had been donor-driven. The strategy prioritized midwifery including staffing at health facilities, revision of training content, increasing student intake, raising the quality of training and trainers, and salary reform.[21]

In 2008, the new Health Minister declared a "Fast track initiative to reduce maternal and newborn mortality" with a target of "midwives in all health centers". It signaled strong leadership from the top, reinforcing the high level commitment seen earlier. Mid-level managers including provincial officials were committed to reaching the target. [22] Through reallocation of midwives from hospitals to health centers, [23] and accelerated production and deployment, the target of ensuring 24-hour delivery service in all health centers was achieved by having at least one midwife in 2009, although 463 health centers (48%) had only PMWs at present (Figure1).

"Slogan [Place midwives in all health centers] is easy to understand for everyone."(DP1)

In 2009, a second midwifery forum reviewed progress. [24] The Forum itself was becoming routine, no longer a tool for innovation in tackling midwifery issues.

d. Reproductive, maternal, newborn and child health taskforce (RMNCHTF)

The RMNCH taskforce was created in 2009 as one of four taskforces under the HSP2. Unlike the HLMWTF, midwifery issues were integrated into the broader RMNCH issues. A mid-level manager with long-time career and field experience developed the terms of reference and served as chair. Taskforce members were drawn from across the MoH, development partners, and NGOs.

This Taskforce identified priority areas and interventions, mobilized financial resources, guided implementation and provided an enabling environment.[25] The Taskforce institutionalized collaboration within the MoH and offered a roadmap for the Fast Track Initiatives. [25]

e. Mid Term Review of the Health Workforce Development Plan 2006-2015

The MoH requested development partners, to facilitate the review of the Health Workforce Development Plan 2006-2015. The Minister of Health established a Human Resource for Health Committee to initially guide the Review and then oversee

implementation of its recommendations. The HRH Committee comprised the Human Resource and MCH leaders and was chaired by the same Secretary of State as the HLMWTF. [26]

f. Stakeholder perspectives on current and future HRH issues

Stakeholder views of HRH issues were consistent with those in MoH reports.[26] Future concerns included the quality of production; regulation of private institutions; retention in rural areas; the shortage of capable staff at MoH; and the sustainability of development partner support. Recognition of the issues and their causes were shared by many stakeholders, potentially reflecting MoH communication.

3. Factors contributing to increasing the coverage of midwifery services

a. Comprehensive approach to decision making and effective implementation

A comprehensive approach covering all components of the HRH system framework ("House Model") and involving necessary stakeholders inside and outside the MoH, both at central and peripheral levels, promoted midwifery services. These contributed to the achievement of quantitative and qualitative HRH targets although interventions were primarily related to the supply side. The HLMWTF was seen as a successful platform and provided a venue for open-discussion, planning and implementation of strategic interventions. Held in a culturally appropriate setting, this prioritized activities with synergistic effects given the resource-limitations. The Taskforce presented a coherent voice to the outside. MoH applied this model and experience to the working of the RMNCH Taskforce in the area of RMNCH services and Human Resource for Health Committee in HRH system development.

> *"HRD produce, PD absorb, and NMCHC support and monitor in-service training. A comprehensive and continuous process. We improved step by step. Like a spiral, I think we can call it 'spiral improvement'." (MOH4)*

b. Political commitment to address high MMR

Political commitment was strong, at a high level, and continuous. Key factors for the success in obtaining such commitment were lobbying by the MoH leadership using survey and other data.[16,,27] Development partners which were influential to the core ministries increased awareness of the growing political commitment.

"It (involvement of other ministries) did not happen before, but I think, the idea for promoting midwives existed in the Council of Administrative Reform, Secretary of Public Function, and Deputy Prime Minister. So we could involve them." (MoH1)

Delivering it, as a clear slogan in the Fast track Initiative ("Place midwives in all health centers") accelerated this strategic intervention. [25]

c. Leadership from the top for decision-making and effective implementation

Strong top-down leadership is acceptable in Cambodia and is taken seriously by subordinates. A capable and experienced Secretary of State negotiated and coordinated with stakeholders including other ministries, mobilized resources, and monitored activities carefully. He created, chaired, and led HLMWTF. The Secretary's position and high capacity for the donor coordination had been effective.

"We need someone strong, behind the scene, and [who can] work for long time." (MoH4)

"...MCH Sub COCOM (Coordination Committee) in 1992 or 1993. I was the chair. .. there was a rumor that I became crazy with lots of development partners… We have a proverb in Khmer, "two cows at the same time, many cows at the same time, we need to gather them". So I did. I need to respect (my) role of coordinator, not blame development partners, but create coordination." (MoH1)

d. "Staff behind the scene": Growing capacity and confidence of mid-level individual managers

The mid-level managers comprised the right persons from necessary departments who had knowledge and experience of practice and evidence-based decision-making and monitoring; substantial experience in the MoH; and working experience with development partners. These mid-level managers, often responsible for technical aspects of programming, prepared the data and documentation that assisted the lobbying and negotiations of the senior MoH leaders.

"Not only people at high positions, but people behind the scene are important…the people at the departments who prepare documents are important, they work as a team." (MoH4)

e. Increased MoH capacity in planning and coordination

Throughout the processes studied, we found evidence of increasing capacity of MoH departments in planning and coordination. For example, the HRD reviewed the quality of PMW production and immediately revised the production mechanisms.[14] The PD collaborated with other ministries and implemented smoothly and strategically the recruitment (Figure 1), deployment and increased salary scale of midwives.[18] In addition, the Cambodian MoH increased its capacity as demonstrated by its role in formulating HSP2 and establishing the RMNCH Taskforce. This increased MoH capacity facilitated policy implementation around midwifery.

Improved quality of MoH data through the introduction of a workforce projection tool, convinced the Council of Ministers to give special treatment to the MoH which increased civil servant allocations to the MoH by 58% annually for the last two years (Figure 1). While not specifically for midwives, many of the positions allocated have been for midwifery; remarkable given that Cambodian government administrative reforms have led to a reduction in civil servant positions overall.

f. Supportive development partners took actions for human resource crisis and MDG goal

The development partners continued to offer technical and financial support. In addition, they brought new perspectives through working closely with MoH departments for a sustained period. These contributed to capacity development of the MoH and are particularly important in 'post'-conflict and fragile states where resources are so limited. These partners were able to draw on their national staff to integrate external perspectives with understanding of the cultural and political sensitivities present.

g. External environment surrounding the health sector

Rapid changes in the external environment after 2000 were also favorable to the health sector in Cambodia. Due to the political stability and security, Cambodia enjoyed economic growth with dramatic improvements in infrastructure, communication, transportation, and the educational level of community members. These improvements facilitated the recruitment of PMW and deployment and retention in remote health centers, which in turn promoted broader HRH system development.

"In the late 90's, only for 40km it took all morning. Now we have clean health

facilities,…. Start(ed) production (in 2003),… when they (the students) graduate(d) and start(ed) working, infrastructure was improved. Timing was perfect." (DP2)

Discussion

The Cambodian case is encouraging although the degree of political stability over the last decade is uncharacteristic for 'post'-conflict countries.[28] A comprehensive and systemic approach focused on midwifery consolidated efforts and rapidly achieved the goal of implementing effective interventions to reduce MMR; this built on the incremental development of the health and HRH systems underpinned by economic growth. A similar comprehensive and systemic approach in Liberia, another 'post'-conflict state, focused on nurses and proved to be effective in expanding service coverage.[29]

Cambodian Taskforces strengthened coordination at the decision-making level and collaboration at the implementation level. The approach enhanced linkages between the components of the "House Model" contributing to HRH system development. Ongoing HRH system development and those focused on midwives reinforced one another. The high level political commitment to promote achievement of the MDGs propelled the system by ensuring resource availability and more speedy decision-making, documented also in a Sierra Leonian case study. [30]

Even when a comprehensive approach is taken, a narrow focus on one cadre (in this case midwives) brought advantages for rapid resource mobilization, but risked delaying attention and efforts to addressing other issues. This may undermine the needed systemic HRH development. Monitoring progress and adjusting decisions accordingly may help shift the focus as needed for future priorities. This ongoing set of responses, including adjustments based on evidence from previous interventions, enabled the HRH system to cope with changing and emerging issues for midwifery. These issues changed from a focus on the availability of personnel to an emphasis on the quality of services and the retention of competent and motivated midwives in rural health centers.[31] These issues were manifest as shared perspectives of the stakeholders.

In Cambodia the Secretary of State played a significant role in establishing appropriate fora, committees, taskforces, and initiatives to ensure a systemic and integrated

approach. The low turnover of mid-level managers reinforced and consolidated their capacity, further sustaining momentum for system development. Team-work linked managers and leadership to promote enhanced processes. The importance of capable senior leadership and mid-level managers working together deserves more attention. Increasing the institutional capacity and resources of MoH departments creates and builds the basis for systemic changes, although this is often neglected. Institutionalizing and reinforcing a comprehensive approach, through regular stakeholder engagement and other measures, warrants further attention.

HRH system development in 'post'-conflict countries takes decades, and needs consistent long-term support at every level of the health system. Such support is more feasible where critical reflections on the HRH system development have occurred and good capacity exists for MoH personnel to drive forward HRH system change and development. Donor-driven development is often pervasive in such countries, resulting in fragmented, short-sighted and often contradictory policies and interventions, as seen in the earlier disruption of midwife training in Cambodia.

Strengths and Limitations

This study is based around the logical flows and framework of the "House Model" developed and presented by the authors (Fujita et al, 2011). The study places particular emphasis on the linkages between the core components and functions of HRH management (production-deployment-retention) and on the different jurisdictions of the government (policy and planning, finance, legal). This draws attention to their interfaces with the HRH system as well as necessitating different types of government capacity. Ongoing refinements of such models are of value in conceptualizing how systems operate and determining how they might be further enhanced or strengthened.

The study insights were derived from three rounds of interviews with key informants, subsequent in-depth analyses of interviews and relevant literature. This approach contributed to identifying and articulating the particular events pertaining to the development of midwifery in Cambodia. Given the profile of informants and cultural context, individual interviews instead of group interviews were considered more appropriate in eliciting the opinions of stakeholders.

Non-Khmer interviewers were both a strength and a limitation; offering a degree of

objectiveness alongside limitations in appreciating cultural nuances. The interviews with MoH personnel in particular enabled detailed insights regarding the roles and actions of stakeholders, as well as of the consequences of such actions for the HRH system. These insights underpinned the study team's interpretation of the events which took place and the factors which contributed to them, thus allowing a comprehensive story to be told.

Although the results of the first and second round interviews defined the focus of interviews on MoH personnel, this may have led to some degree of bias in descriptions of the main events concerning MMR reductions, and in so doing reducing scope for exploring more comprehensively the perspectives of other relevant ministries. Another limitation is that we were unable to examine the perspectives of provincial and district level personnel, and those of midwives themselves, in relation to interventions to reduce MMR. Unexpected consequences of policy interventions at local levels may not have been fully explored as a result. The perspectives of provincial and district levels, and midwives were, however, not the main focus of our research.

Conclusion

This study examines and documents the key events and underlying factors which contributed to an emphasis on midwifery as part of the response to high maternal mortality and simultaneously to building the HRH system. The well-focused and integrated approach was central to Cambodian achievements. Increased MoH capacity, both at organizational and individual levels, also contributed. Capable senior and mid-level managers are vital for HRH system development, especially in 'post'-conflict countries. The systemic approach adopted could well be applied to other existing and emerging priority health issues.

In Cambodia and elsewhere, the HRH systems approach needs to be complemented by consolidating sustainability. Studies of HRH system experiences are little documented but valuable. Such critical but constructive debate offers useful insights for HRH system development.

Competing interests

We declare that we have no competing interests.

Author's contribution

NF and KA reviewed literature, designed and conducted interviews, analyzed the results and wrote the first draft. AZ and ArR contributed to the design, conceptualization, methods, analysis and writing. RT and PK contributed to the literature review and preparation of chronology. AnR contributed to the draft revision. All authors reviewed and agreed with the final version of the paper.

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Ethical consideration

This study was approved by the Ethical Committee of National Center for Global Health and Medicine, Japan, and by that of the Ministry of Health, Cambodia.

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Addressing the human resource crisis: A case study of Cambodia's efforts to reduce maternal mortality (1980-2012)

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Cambodia, midwifery, human resources for health (HRH), maternal mortality, MDGs, human resource systems, health systems strengthening, post-conflict

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Abstract

Objective: To identify factors that have contributed to the systematic development of the Cambodian human resources for health (HRH) system with a focus on midwifery services in response to high maternal mortality in fragile resource-constrained countries.

Design: Qualitative case study. Review of published and grey literature and in-depth interviews with key informants and stakeholders using an HRH system conceptual framework developed by the authors ('House Model'; Fujita et al, 2011). Interviews focused on the perceptions of respondents regarding their contributions to strengthening midwifery services and the other external influences which may have influenced the HRH system and reduction in the maternal mortality ratio (MMR).

Setting and participants: Three rounds of interviews were conducted with a total of 49 senior and mid-level managers of the Ministries of Health (MoH) and Education, educational institutes and development partners. The interviewees were identified through a snowball sampling technique.

Main outcome measures: Scaling up the availability of 24-hour maternal health services at all health centers contributing to MMR reduction.

Results: The incremental development of the Cambodian HRH system since 2005 focused on the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services contributed to significant MMR reduction. Other contributing factors included improved mechanisms for decision-making and implementation; political commitment backed up with necessary resources; leadership from the top along with growing capacity of mid-level managers; increased MoH capacity to plan and coordinate; and supportive development partners in the context of a conducive external environment.

Conclusion: Lessons from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of ongoing capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies.

Article summary

Article focus

To identify factors that contributed to the systemic development of the Cambodian human resources for health (HRH) system and to derive lessons for HRH system development in fragile resource-constrained countries.

Key messages

- Lessons derived from this case study point to the importance of a systemic and comprehensive approach to health and HRH system strengthening and of continuous capacity enhancement and leadership development to ensure effective planning, implementation and monitoring of HRH policies and strategies. A conceptual framework "House Model" (Fujita et al, 2011) developed by the authors formed the backbone for assessing the key variables that impact on the HRH system and the dynamic interrelationships between them.
- The Cambodian HRH system has developed incrementally to improve the production, deployment and retention of midwives in rural areas as part of a systematic strategy to reduce maternal mortality. The improved availability and access to midwifery services is likely to have contributed significantly to reducing the maternal mortality ratio (MMR).
- Other factors which contributed to MMR reduction included the development of effective mechanisms for decision-making and implementation; political commitment to reduce MMR and mobilize required resources; leadership from the top along with growing capacity of mid-level managers; increased Ministry of Health (MoH) capacity to plan and coordinate; and supportive development partners within a conducive external environment.

Strengths and Limitations

1. The thrust of this study is based on the logical flows and framework of the "House Model" developed and presented by the authors (Fujita et al, 2011). This study also places particular emphasis on the linkages between the core components and functions of HRH management and on the different jurisdictions of the government. This draws attention to their interface with the HRH system and the requirement for a variety of types of government capacity. On-going refinements to such models are of value in fine-tuning our understanding of how systems function and can be strengthened.

2. Study insights were derived from three rounds of interviews with key informants, in-depth analyses of these interviews and associated relevant literature. This approach contributed to identifying and articulating the particular events pertaining to the development of midwifery in Cambodia. The interviews with MOH personnel in particular enabled detailed insights regarding the roles and actions of stakeholders, as well as of the consequences of these actions for the system. These insights underpinned the study team's interpretation of the events which took place and the factors which contributed to them, thus allowing a comprehensive story to be told.

3. Interviews focused largely on the Ministry of Health (MoH) and did not explore the perspectives of other relevant ministries. This may have contributed to a degree of bias in describing the main events contributing to MMR reductions. The perspectives of provincial and district authorities and midwives were beyond the scope of this study as was a detailed exploration of any unintended negative consequences of the policies and processes described and their impact on day to day performance and the ability to provide quality services. These merit further exploration.

Introduction

Poor health outcomes are often associated with a shortage and/or mal-distribution of health professionals. [1] Piecemeal approaches to human resources for health (HRH) that focus on one issue, such as production or deployment, while neglecting other aspects of the HRH system are ineffective, particularly in fragile countries where the health system, infrastructure and social services are under-developed.[2] Improving maternal, newborn and child health and reducing maternal mortality requires a comprehensive approach, involving competent and committed midwives to ensure 24-hour service delivery and a strong focus on equity of access to maternity care by skilled birth attendant. [3,4]

Cambodia has been identified as one of the poorest countries in South East Asia. Most (80%) of the population of 13.4 million lived in rural areas in 2008. [5] The health status of Cambodians ranked low compared to other countries in the Region; the infant mortality rate was assessed in 2010 as 45 per 1,000 live births and maternal mortality ratio as 206 per 100,000 live births. [6]

Midwives in Cambodia are the main workforce dealing with reproductive, maternal and newborn care in hospitals and health centers. Their work includes basic emergency obstetric care as defined in the standard package of activities for each level of facilities. [7] The midwives are classified in two categories (primary and secondary) according to the duration of professional education. Although both work at all levels of the health system, the original intention was that primary midwives would work at health centers and in a supportive role to secondary midwives.[7]

Cambodia has focused on HRH in the 'post'-conflict* period since the 1990's. Incremental efforts to scale up the quantity and quality of HRH focused on the production of midwives from 2000 and intensified production of both primary and secondary midwifes after 2005. These efforts resulted in an increased number of midwives working at health centers and significant improvements in the coverage of maternal health services (Figures 1 and 2). Recent international analyses of maternal

* We use the term 'post'-conflict in recognition of the fact that in many such countries conflict continues in some areas or recurs. [28]

mortality highlight the significant improvements in Cambodia (Figure 2). [6,8] Despite financial constraints, Cambodian government health expenditure has steadily increased (Figure 3), reflecting national commitment and leadership. The "story behind this story" (ABZ) of achievement deserves to be analyzed and documented.

This paper aims to;

a) present insights and evidence of the achievements resulting from the investment in midwives and the systems in which they operate;
b) describe and analyze the factors related to extending and supporting midwifery; and
c) assess the broader implications for HRH systems development, policy and practice.

Methods

Policy documents and reports, both in published and grey literature in four languages (English, Khmer, Japanese, and French) were reviewed and data base were searched (PubMed and Science Direct) with key words (Cambodia, midwife, midwifery health system, health workers, HRH, and words similar to these words). The literature identified through these searches was assessed by all authors with reference to the "House Model" (Figure 4) [2] which highlights 11 closely linked and interdependent elements of the HRH system. It includes additional components and functions of the HRH system which were not independently recognized within the WHO framework but which appear significant in light of this study, including the legal and regulatory framework. We examined the events and processes which contributed to and/or impeded the development of the HRH system, with an emphasis on the particular attention given to midwives as a key component of the strategy to address maternal and child health (MCH).

The decision to conduct interviews with individual stakeholders rather than groups was based on consideration of cultural context and the readiness of stakeholders to offer critical views of their superiors and their organizations. Data collection occurred in three complementary stages. The first and second rounds of interviews sought to describe HRH system development, issues and opportunities. The first focused more on the role of stakeholders and their views on the present HRH system while the second enquired about HRH system development, future priorities and sustainability. A third

round of interviews focused on midwifery in Cambodia since 1980 and explored key midwifery issues identified from both the literature and the earlier interviews, with a focus on the roles of stakeholders and external influences. The approach emphasized a strengths-based approach, seeking to identify and explore in greater detail those factors which contributed to, rather than hindered, system development.

In September 2011, the first series of interviews was conducted with 30 stakeholders (14 Ministry of Health (MoH), 1 non-health Ministry, 5 educational institutes, 2 professional councils, and 10 development partner agencies). The second set in June 2012 included 5 MoH personnel and 2 development partner agencies. The third round, in August 2012, included 12 stakeholders (9 MoH senior and middle-level managers, 2 development partner agencies). Key informants were identified through the earlier interviews and a snowball technique (Figure 4-1). The first two rounds of interviews identified the strong top-down approach to decision-making (illustrated in findings below) that limited the participation in decision-making and policy-making to a narrow range. As a result, the key informants in the third round of interviews were those working for the MoH and development partners despite seeking, through snowball sampling, to widen the identification of those participating in these processes. Educational institutions had limited participation and influence in the policy and decision making processes and the professional councils also had limited influence as they were in early stages of development.

Interviews were conducted in English by two researchers (KA and NF), who had working experiences in health technical cooperation projects and health studies in the country over a decade. An interpreter assisted with four non-English speaking interviewees in the first round of interviews.

Transcripts were analyzed through inductive coding performed separately by KA and NF using Nvivo 9. The two sets of coding were compared and combined after discussing any differences. Core concepts were discussed and refined in consultation with ABZ and ArR. Key contributing factors were derived from concepts referring to each component and linkages between the core components of the "House Model" and different jurisdictions of the government (policy and planning, finance, legal). The linkages incorporate HRH management (production-deployment-retention)

Findings

In this section, we first present the chronology of HRH system development (Table 1) focusing on midwifery issues from 1980 onward, corresponding to the period covered by this study. The chronology (Table 1) draws in new findings from the archival review which took 1946 as the start-date. We present key events in the evolution of a more comprehensive approach to reducing maternal mortality and which covers the components of the House Model. We also present stakeholder perspectives on HRH issues and identify those factors which contributed to increases in midwifery service coverage.

1. Chronology of HRH system development, focused on midwifery since 1980 until 2005 (Table 1)

The following sub-sections depict chronologically the main issues, responses and developments concerning HRH in midwifery (1980-2005). The areas covered include policies and plans, production, deployment, and retention, organizations, and partnership with development partners.

a. Accelerated production after the Khmer Rouge genocide

Since very few health professionals survived the Khmer Rouge (1975-1979), Cambodia needed to reconstruct its health system to provide basic services and accelerate the production of health personnel.[9] The MoH standardized curricula for nursing and midwifery schools for two types of midwife: primary and secondary. [10] Agencies working in the Thai-border refugee camps continued to produce health workers with varying abilities.[9]

b. Development of MoH institutional capacity and organizational evolution for HRH

From the 1990's the MoH started to develop institutional capacity, with international community support. In 1995, as part of the health sector reforms, the MoH established the Department of Human Resources Development (HRD, in charge of production and continuous education), the Personnel Department (PD, deployment and personnel management), and the National Maternal and Child Health Center (NMCHC, maternal and child health national programs).[9] Some core MoH staff were sent abroad to study public health with the support of development partners.

c. Policies and Plans: shifting from quantity to quality, suspension of production of midwives

The MoH developed HRH policy with external technical assistance and formulated a health workforce plan, rationalized professional categories and shifted the focus from producing large numbers of basic health workers to ensuring availability of better qualified staff.[11] This change, influenced by the development partners resulted in the suspension of midwifery training between 1997 and 2003,[12] resulting in a 10% decrease in numbers. This hindered the capacity to attain staffing standards for midwives especially in rural areas[13] (Figure 1).

"...It was a big mistake, big, big mistake. I think at that time, the international standard was not consistent with the real situation of Cambodia." (MoH1)

d. Accelerated production to respond to acute shortages

The shortage of midwives became apparent early in the 2000's.[13] The MoH responded promptly to address the shortage and accelerated production through a one-year primary midwife (PMW) course.[12] Following a situation analysis by HRD, the PMW course started in 2003 in four provinces. It was delivered by provincial health departments (PHDs) with provincial trainers, adapting arrangements from the 1980s, emphasizing local recruitment, establishing workplace contracts and providing student allowances.[14]

Around the same time (2002) the First Health Strategic Plan (HSP1) 2003-2008 was formulated and provided MoH staff with clear direction for human resource development.

"[Formulation of] policy and health strategic plan was an achievement. Before [it was] not clear, no guidelines." (MoH7)

In 2005, given dissatisfaction with the quality of the PMW graduates, the MoH decided to shift the responsibility for training from the PHDs to the regional training institutes that were expected to offer better quality programs .[12,14]

e. Changes associated with partnership with development partners

In the process of expanding the sector-wide approach (SWAP), a group of development partners established a pooled fund as a new funding modality.[15] This modality provided MoH departments with more flexible and accessible micro-level budgeting based on

their self-designed plans.

2. Key events in the evolution of a comprehensive approach to reducing maternal mortality and stakeholder perspectives on HRH issues (Table 1)

a. First Midwifery Forum (2005)

The high MMR (472 per 100,000 live births) identified through the Demographic and Health Survey (DHS) 2005 evoked major concerns[16] and propelled the MoH to take urgent action.

> *"Everyone woke up. All felt ashamed… We talked that we have to do something." (DP2*)

The first Midwifery Forum convened in December 2005 was a high profile national event which promoted political commitment to systematically and comprehensively tackle maternal mortality.[17] Relevant stakeholders from the Deputy Prime Minister to field midwives were involved and represented every component of the HRH system (Figure 4-2). Final recommendations included concrete multi-dimensional and multi-sectoral interventions: increasing the number of midwives at health centers, motivating midwives through increasing salaries and performance incentives, improving working and living conditions in rural areas, and supporting midwifery education and students. [17]

The top-level decision to reward performance for a live birth ('delivery incentive') at hospitals and health centers had a great impact on the reduction of MMR. The government-funded delivery incentive (US $10-15) was successfully implemented in 2007, and involved the provincial treasury and commune council. [18]

> *"Recommendations from the Forum were very positive and effective for reducing MMR. ….It was a starting point to promote midwives." (MoH1)*

Stakeholder involvement was evident with contributions from development partners. The Secretary of State set the agenda, involved key stakeholders and engaged mid-level managers from MoH departments (HRD, PD, and NMCHC) in decision-making, drawing on relevant data.

b. High-level midwifery taskforce (HLMWTF)

Following the first national Midwifery Forum, a comprehensive situation analysis supported by development partners identified effective interventions in 2006.[7] This led to the development partners and Secretary of State establishing in 2007 a High Level Midwifery Taskforce chaired by the Secretary of State. This event can be seen as the beginning of a sustained systemic approach with participation of mid-level managers from departments for planning, production, deployment, and maternal health service delivery.[19] The strong leadership enhanced by delegation from the Health Minister promoted coordination with other ministries.

"...the terms of reference [of HLMWTF] ... [appeared] in the top-down form... [suddenly] one day, a notice of the TOR was put on the wall, delivered" (DP1)"

The HLMWTF developed a multi-year plan focusing both on quantity and quality of midwives and maternal health services.[20] Agreed objectives (increased coverage of midwifery services for the reduction of MMR) and a clear role for Taskforce members provided an opportunity for collaborative planning and implementation of strategic interventions. Monitoring indicators were reported to MoH and Annual Health Review meetings provided a platform for broad participation by development partners.[20] Within the Taskforce, the development partners contributed skills and knowledge and worked closely with relevant MoH departments. Their Cambodian national staff played a role as mediators.

"We collaborate(d) with transparency and accountability [about our work] within a [specified] timeframe. So that our plan is not an ambitious plan but effective with limited resources. " (MoH5)

The mid-level managers facilitated consecutive implementation of effective interventions. (Figure 4-2)

"The advantage [of the HLMWTF] was that Directors of MoH departments actually met. There had not been many opportunities….Without having communication, each department…acted inconsistently…like a typical Cambodian way (DP1)

c. Fast track initiative

The Second Health Strategic Plan (HSP2) 2008-2015 was developed in 2008.[21] The

MoH contributed much more actively than to earlier efforts, which had been donor-driven. The strategy prioritized midwifery including staffing at health facilities, revision of training content, increasing student intake, raising the quality of training and trainers, and salary reform.[21]

In 2008, the new Health Minister declared a "Fast track initiative to reduce maternal and newborn mortality" with a target of "midwives in all health centers". It signaled strong leadership from the top, reinforcing the high level commitment seen earlier. Mid-level managers including provincial officials were committed to reaching the target. [22] Through reallocation of midwives from hospitals to health centers, [23] and accelerated production and deployment, the target of ensuring 24-hour delivery service in all health centers was achieved by having at least one midwife in 2009, although 463 health centers (48%) had only PMWs at present (Figure1).

"Slogan [Place midwives in all health centers] is easy to understand for everyone."(DP1)

In 2009, a second midwifery forum reviewed progress. [24] The Forum itself was becoming routine, no longer a tool for innovation in tackling midwifery issues.

d. Reproductive, maternal, newborn and child health taskforce (RMNCHTF)

The RMNCH taskforce was created in 2009 as one of four taskforces under the HSP2. Unlike the HLMWTF, midwifery issues were integrated into the broader RMNCH issues. A mid-level manager with long-time career and field experience developed the terms of reference and served as chair. Taskforce members were drawn from across the MoH, development partners, and NGOs.

This Taskforce identified priority areas and interventions, mobilized financial resources, guided implementation and provided an enabling environment.[25] The Taskforce institutionalized collaboration within the MoH and offered a roadmap for the Fast Track Initiatives. [25]

e. Mid Term Review of the Health Workforce Development Plan 2006-2015

The MoH requested development partners, to facilitate the review of the Health Workforce Development Plan 2006-2015. The Minister of Health established a Human Resource for Health Committee to initially guide the Review and then oversee

implementation of its recommendations. The HRH Committee comprised the Human Resource and MCH leaders and was chaired by the same Secretary of State as the HLMWTF. [26]

f. Stakeholder perspectives on current and future HRH issues

Stakeholder views of HRH issues were consistent with those in MoH reports.[26] Future concerns included the quality of production; regulation of private institutions; retention in rural areas; the shortage of capable staff at MoH; and the sustainability of development partner support. Recognition of the issues and their causes were shared by many stakeholders, potentially reflecting MoH communication.

3. Factors contributing to increasing the coverage of midwifery services

a. Comprehensive approach to decision making and effective implementation

A comprehensive approach covering all components of the HRH system framework ("House Model") and involving necessary stakeholders inside and outside the MoH, both at central and peripheral levels, promoted midwifery services. These contributed to the achievement of quantitative and qualitative HRH targets although interventions were primarily related to the supply side. The HLMWTF was seen as a successful platform and provided a venue for open-discussion, planning and implementation of strategic interventions. Held in a culturally appropriate setting, this prioritized activities with synergistic effects given the resource-limitations. The Taskforce presented a coherent voice to the outside. MoH applied this model and experience to the working of the RMNCH Taskforce in the area of RMNCH services and Human Resource for Health Committee in HRH system development.

> *"HRD produce, PD absorb, and NMCHC support and monitor in-service training. A comprehensive and continuous process. We improved step by step. Like a spiral, I think we can call it 'spiral improvement'." (MOH4)*

b. Political commitment to address high MMR

Political commitment was strong, at a high level, and continuous. Key factors for the success in obtaining such commitment were lobbying by the MoH leadership using survey and other data.[16,,27] Development partners which were influential to the core ministries increased awareness of the growing political commitment.

"It (involvement of other ministries) did not happen before, but I think, the idea for promoting midwives existed in the Council of Administrative Reform, Secretary of Public Function, and Deputy Prime Minister. So we could involve them." (MoH1)

Delivering it, as a clear slogan in the Fast track Initiative ("Place midwives in all health centers") accelerated this strategic intervention. [25]

c. Leadership from the top for decision-making and effective implementation

Strong top-down leadership is acceptable in Cambodia and is taken seriously by subordinates. A capable and experienced Secretary of State negotiated and coordinated with stakeholders including other ministries, mobilized resources, and monitored activities carefully. He created, chaired, and led HLMWTF. The Secretary's position and high capacity for the donor coordination had been effective.

"We need someone strong, behind the scene, and [who can] work for long time." (MoH4)

"...MCH Sub COCOM (Coordination Committee) in 1992 or 1993. I was the chair. .. there was a rumor that I became crazy with lots of development partners… We have a proverb in Khmer, "two cows at the same time, many cows at the same time, we need to gather them". So I did. I need to respect (my) role of coordinator, not blame development partners, but create coordination." (MoH1)

d. "Staff behind the scene": Growing capacity and confidence of mid-level individual managers

The mid-level managers comprised the right persons from necessary departments who had knowledge and experience of practice and evidence-based decision-making and monitoring; substantial experience in the MoH; and working experience with development partners. These mid-level managers, often responsible for technical aspects of programming, prepared the data and documentation that assisted the lobbying and negotiations of the senior MoH leaders.

"Not only people at high positions, but people behind the scene are important…the people at the departments who prepare documents are important, they work as a team." (MoH4)

e. Increased MoH capacity in planning and coordination

Throughout the processes studied, we found evidence of increasing capacity of MoH departments in planning and coordination. For example, the HRD reviewed the quality of PMW production and immediately revised the production mechanisms.[14] The PD collaborated with other ministries and implemented smoothly and strategically the recruitment (Figure 1), deployment and increased salary scale of midwives.[18] In addition, the Cambodian MoH increased its capacity as demonstrated by its role in formulating HSP2 and establishing the RMNCH Taskforce. This increased MoH capacity facilitated policy implementation around midwifery.

Improved quality of MoH data through the introduction of a workforce projection tool, convinced the Council of Ministers to give special treatment to the MoH which increased civil servant allocations to the MoH by 58% annually for the last two years (Figure 1). While not specifically for midwives, many of the positions allocated have been for midwifery; remarkable given that Cambodian government administrative reforms have led to a reduction in civil servant positions overall.

f. Supportive development partners took actions for human resource crisis and MDG goal

The development partners continued to offer technical and financial support. In addition, they brought new perspectives through working closely with MoH departments for a sustained period. These contributed to capacity development of the MoH and are particularly important in 'post'-conflict and fragile states where resources are so limited. These partners were able to draw on their national staff to integrate external perspectives with understanding of the cultural and political sensitivities present.

g. External environment surrounding the health sector

Rapid changes in the external environment after 2000 were also favorable to the health sector in Cambodia. Due to the political stability and security, Cambodia enjoyed economic growth with dramatic improvements in infrastructure, communication, transportation, and the educational level of community members. These improvements facilitated the recruitment of PMW and deployment and retention in remote health centers, which in turn promoted broader HRH system development.

"In the late 90's, only for 40km it took all morning. Now we have clean health

facilities,…. Start(ed) production (in 2003),… when they (the students) graduate(d) and start(ed) working, infrastructure was improved. Timing was perfect." (DP2)

Discussion

The Cambodian case is encouraging although the degree of political stability over the last decade is uncharacteristic for 'post'-conflict countries.[28] A comprehensive and systemic approach focused on midwifery consolidated efforts and rapidly achieved the goal of implementing effective interventions to reduce MMR; this built on the incremental development of the health and HRH systems underpinned by economic growth. A similar comprehensive and systemic approach in Liberia, another 'post'-conflict state, focused on nurses and proved to be effective in expanding service coverage.[29]

Cambodian Taskforces strengthened coordination at the decision-making level and collaboration at the implementation level. The approach enhanced linkages between the components of the "House Model" contributing to HRH system development. Ongoing HRH system development and those focused on midwives reinforced one another. The high level political commitment to promote achievement of the MDGs propelled the system by ensuring resource availability and more speedy decision-making, documented also in a Sierra Leonian case study. [30]

Even when a comprehensive approach is taken, a narrow focus on one cadre (in this case midwives) brought advantages for rapid resource mobilization, but risked delaying attention and efforts to addressing other issues. This may undermine the needed systemic HRH development. Monitoring progress and adjusting decisions accordingly may help shift the focus as needed for future priorities. This ongoing set of responses, including adjustments based on evidence from previous interventions, enabled the HRH system to cope with changing and emerging issues for midwifery. These issues changed from a focus on the availability of personnel to an emphasis on the quality of services and the retention of competent and motivated midwives in rural health centers.[31] These issues were manifest as shared perspectives of the stakeholders.

In Cambodia the Secretary of State played a significant role in establishing appropriate fora, committees, taskforces, and initiatives to ensure a systemic and integrated

approach. The low turnover of mid-level managers reinforced and consolidated their capacity, further sustaining momentum for system development. Team-work linked managers and leadership to promote enhanced processes. The importance of capable senior leadership and mid-level managers working together deserves more attention. Increasing the institutional capacity and resources of MoH departments creates and builds the basis for systemic changes, although this is often neglected. Institutionalizing and reinforcing a comprehensive approach, through regular stakeholder engagement and other measures, warrants further attention.

HRH system development in 'post'-conflict countries takes decades, and needs consistent long-term support at every level of the health system. Such support is more feasible where critical reflections on the HRH system development have occurred and good capacity exists for MoH personnel to drive forward HRH system change and development. Donor-driven development is often pervasive in such countries, resulting in fragmented, short-sighted and often contradictory policies and interventions, as seen in the earlier disruption of midwife training in Cambodia.

Strengths and Limitations

This study is based around the logical flows and framework of the "House Model" developed and presented by the authors (Fujita et al, 2011). The study places particular emphasis on the linkages between the core components and functions of HRH management (production-deployment-retention) and on the different jurisdictions of the government (policy and planning, finance, legal). This draws attention to their interfaces with the HRH system as well as necessitating different types of government capacity. Ongoing refinements of such models are of value in conceptualizing how systems operate and determining how they might be further enhanced or strengthened.

The study insights were derived from three rounds of interviews with key informants, subsequent in-depth analyses of interviews and relevant literature. This approach contributed to identifying and articulating the particular events pertaining to the development of midwifery in Cambodia. Given the profile of informants and cultural context, individual interviews instead of group interviews were considered more appropriate in eliciting the opinions of stakeholders.

Non-Khmer interviewers were both a strength and a limitation; offering a degree of

objectiveness alongside limitations in appreciating cultural nuances. The interviews with MoH personnel in particular enabled detailed insights regarding the roles and actions of stakeholders, as well as of the consequences of such actions for the HRH system. These insights underpinned the study team's interpretation of the events which took place and the factors which contributed to them, thus allowing a comprehensive story to be told.

Although the results of the first and second round interviews defined the focus of interviews on MoH personnel, this may have led to some degree of bias in descriptions of the main events concerning MMR reductions, and in so doing reducing scope for exploring more comprehensively the perspectives of other relevant ministries. Another limitation is that we were unable to examine the perspectives of provincial and district level personnel, and those of midwives themselves, in relation to interventions to reduce MMR. Unexpected consequences of policy interventions at local levels may not have been fully explored as a result. The perspectives of provincial and district levels, and midwives were, however, not the main focus of our research.

Conclusion

This study examines and documents the key events and underlying factors which contributed to an emphasis on midwifery as part of the response to high maternal mortality and simultaneously to building the HRH system. The well-focused and integrated approach was central to Cambodian achievements. Increased MoH capacity, both at organizational and individual levels, also contributed. Capable senior and mid-level managers are vital for HRH system development, especially in 'post'-conflict countries. The systemic approach adopted could well be applied to other existing and emerging priority health issues.

In Cambodia and elsewhere, the HRH systems approach needs to be complemented by consolidating sustainability. Studies of HRH system experiences are little documented but valuable. Such critical but constructive debate offers useful insights for HRH system development.

Competing interests

We declare that we have no competing interests.

Author's contribution

NF and KA reviewed literature, designed and conducted interviews, analyzed the results and wrote the first draft. AZ and ArR contributed to the design, conceptualization, methods, analysis and writing. RT and PK contributed to the literature review and preparation of chronology. AnR contributed to the draft revision. All authors reviewed and agreed with the final version of the paper.

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Ethical consideration

This study was approved by the Ethical Committee of National Center for Global Health and Medicine, Japan, and by that of the Ministry of Health, Cambodia.

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Table1: Evolution and chronology of health system, human resource system, and midwifery-related issues in Cambodia (1946-2012)

Year	Health and human resource system development	Midwifery-related issues
1946	First modern school of health professionals in Cambodia established in Phnom Penh.[10]	
1953	National Independence: Sihanouk regime Royal school for Medicine established; commenced education of medical doctors and health officers.[10]	
1961	Royal School for Nurses and Midwives created under the MoH.[10]	Two levels of nurses and midwives trained (State Nurse and State Midwife, Auxiliary Nurse and Rural Midwife).[10]
1970	Lon Nol regime (1970-75) Political instability. Educational programs became irregular. [10]	
1975-79	Khmer Rouge regime Genocide and destruction of institutions; educational system changed as two categories of health professionals trained at hospitals.[10]	
1979	Vietnamese-led liberation. State of Cambodia Rebuilding the state along the lines of the Vietnamese health system.[9,10]	Provincial Training Center set up, provided 6-month training of Primary Nurse and Primary Midwife working at primary level health facilities or health centers, without standardized curriculum. [10]
1980		Technical School for Medical Care (TSMC) established in Phnom Penh; provided training for nurse/midwife and allied health personnel; Besides primary level, Secondary Nurse and Secondary Midwife training, for hospital-based work, started at TSMC. [10]
1987		All provincial training centers absorbed into 4 Regional Training Centers (RTCs); these provided training of nurses and midwives both at primary and secondary level with standardized curriculum. [10]

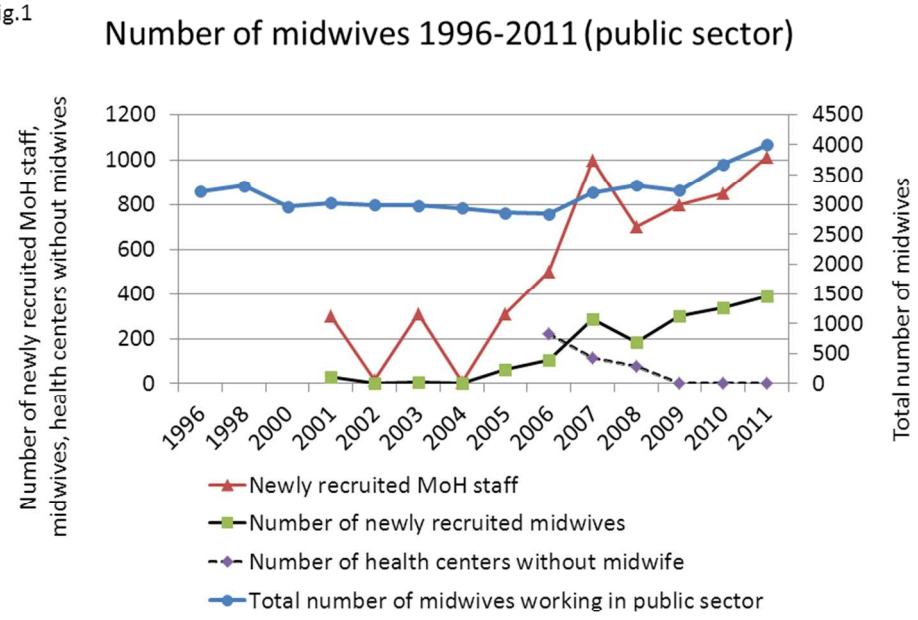
1989		Primary Nurse and Midwife course ended (academic year 1987/1989). [10]
1991		Bridging course from primary level to secondary level started and continued until 2001.[10]
1991	Paris Peace Accord and UN Transitional Authority in Cambodia (UNTAC)	
1993	First General Election – First Mandate (1993-1998) Health workforce survey (by MoH and WHO) revealed overwhelming number of workers of varying abilities, unregistered and without career structure.[9] Coordination Committee (COCOM) established as a coordination mechanism with development partners, NGOs and MoH at central and provincial level with subcommittees (Sub COCOM) according to technical areas.[9]	
1995	Health Coverage Plan (Health sector reform)	
1996	Human resources development policy and health workforce plan (1996-2005) [11] Rationalization of 59 categories of health workers trained; MoH sought to rationalize these into 29 equivalents.[9]	Secondary Midwife course ended; no production of new midwives until 2003, both primary and secondary level. [12]
1998	Second General Election – Second Mandate (1998-2003)	
2000	Health workforce plan, midterm review [13]	Midterm review identified alarming shortage of midwives. [13]
2002		Diploma of Nursing and Midwifery (3 year nursing + 1 year midwife) (3+1 course) started at TSMC and RTC. [12]
2003	Third Mandate (2003-2008) Health Strategic Plan I (2003-2008)	Stakeholders' meeting, organized by MoH/HRD, decided 3+1 course and primary midwife course as a strategy to address the shortage of midwives.[12] Few candidates applied to 3+1 course because of little advantage of attending 1 more year to become midwife. [12] Primary Nurse/Midwife (1 year, direct entry) course started in remote north east region by provincial health departments (PHD) and provincial trainers

		along with local recruitment and deployment mechanism.[14]
2004		Survey result revealed "Not enough skilled midwives, poor working environment and little motivation, girls do not want to be midwives" .[27]
2005	Health Sector Support Project (pooled fund mechanism) started [15]	Demographic and Health Survey 2005 revealed MMR of 472 per 100,000 live births; very high and little changed over time; evoked major concern within MoH.[16] Primary Midwife/Nurse course shifted from PHD to RTCs and covers whole country because of the unsatisfactory quality of training at PHD, local recruitment and deployment system continued. [12] First Midwifery Forum (Dec 2005) [15]
2006	Health Workforce Development Plan 2006-2015	Comprehensive midwifery review identified the target number of midwives to reduce MMR. [7] Stipend was provided for 3+1 course students until Associated Degree of MW (3 years course) started in 2008 (personal communication; UNFPA program manager)
2007		High Level Midwifery Taskforce established and developed a multi-year plan. [19,20] Live-birth incentives for health centers and referral hospitals [18] ,associated with MW recruitment and improved salary scale.[32]
2008	Fourth Mandate (2008-2013) Health Strategic Plan II (2008-2015)[21]	The strategy prioritized midwifery, with target of staffing level at health facilities, revision of training content, increased student intake, quality of training and trainers, and salary reform. [21] New Health Minister declares "Fast track initiatives to reduce maternal and newborn mortality" with a target of "midwives in all health centers".

		Midwifery deployment task force established at MoH to prepare strategies to reallocate midwives to meet the target. [22,23]
2009	Reproductive, Maternal, Newborn and Child Health (RMNCH) Taskforce established as one of four taskforces under Health Strategic Plan 2 (2008-2015)[21]	Achieved "Midwives in all health centers", but around 60% of health centers only have primary midwives. Second Midwifery Forum [24]
2010	RMNCH taskforce prepared roadmap for the Fast track initiatives to identify priority areas and interventions, mobilize financial support, identify policy issues and guide implementing units of MoH [25]	Delivery incentives continued New monitoring indicators set up (At least two midwives in all health centers, of which one is secondary midwife). [25]
2011	Health Workforce Development Plan 2006-2015, midterm review[26]	Demographic Health Survey 2010 revealed MMR reduction (206 per 100,000 live births) [6]

References as per reference number

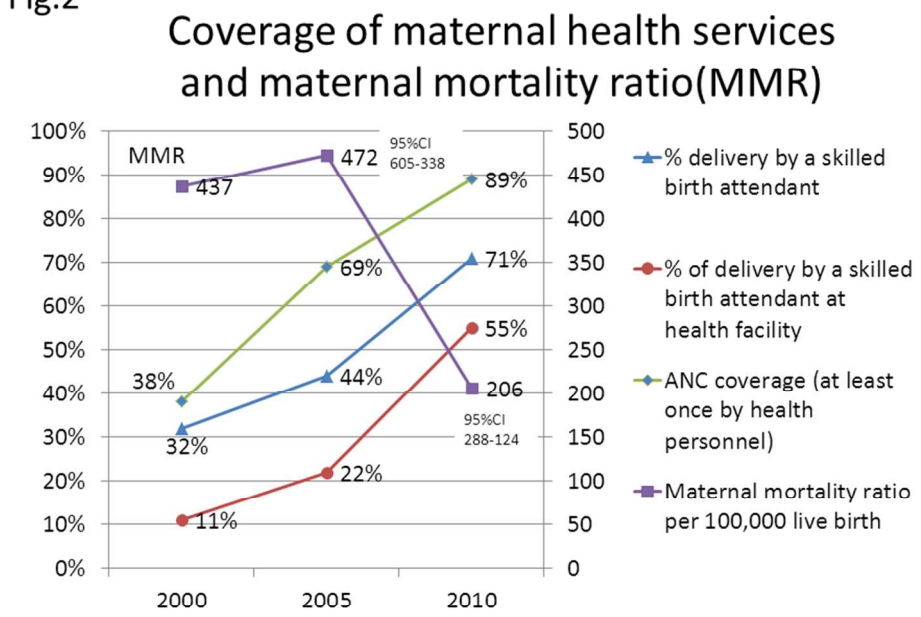
Fig.1



Data source: Personnel Department, MOH, Cambodia

254x190mm (96 x 96 DPI)

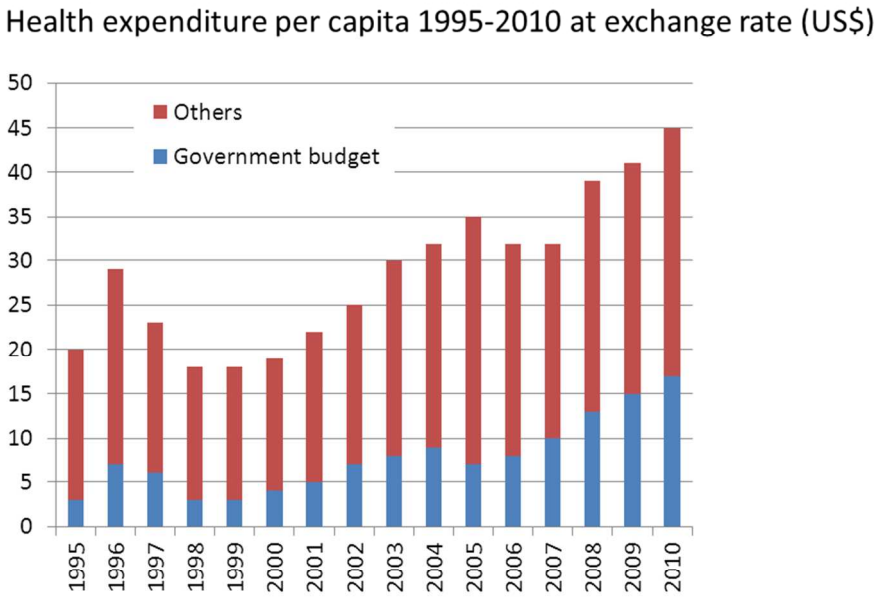
Fig.2



Data source: Cambodia Demographic and Health Survey 2000, 2005, 2010
A skilled birth attendant is defined as an accredited health professional who has proficiency in the skills to manage normal and complication during pregnancy, childbirth, postnatal period (WHO). In Cambodia are mostly midwives.

254x190mm (96 x 96 DPI)

Fig.3



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254x190mm (96 x 96 DPI)

Fig 4-1 Stakeholder mapping (House model)

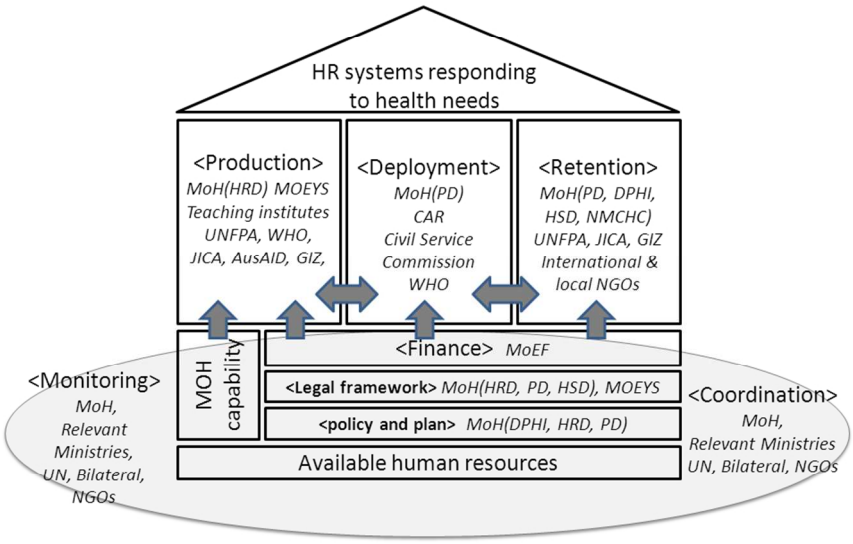
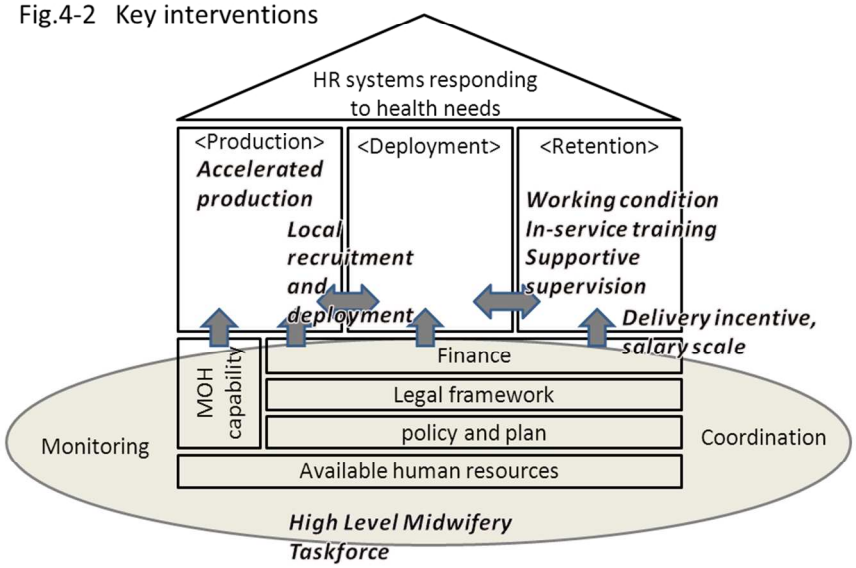


Fig.4-2 Key interventions



266x355mm (96 x 96 DPI)

Figure 4. Acronym

Aus AID: Australian Agency for International Development

CAR: Council for Administrative Reform

DPHI: Department of Planning and Health Information, Ministry of Health

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit

HRD: Human Resource Development Department, Ministry of Health

HSD: Hospital Service Department, Ministry of Health

MOEYS: Ministry of Education, Youth and Sport

MOEF: Ministry of Economy and Finance

MOH: Ministry of Health

NGO: Non-governmental Organization

NMCHC: National Maternal and Child Health Center

PD: Personnel Department, Ministry of Health

JICA: Japan International Cooperation Agency

UN: United Nations

UNFPA: United Nations Population Fund

WHO: World Health Organization