May 2019

Mid-level health providers (MLHPs) for primary healthcare

Rapid Policy Brief

Included:

- Description of the role MLHPs are supposed to play in India
- Summary of available research evidence from systematic reviews on MLHPs for improving health outcomes and systems performance. Considerations about the relevance of the above for low- and middle- income countries (LMIC), specifically for India are included.

Who is this policy brief for?

Policymakers, health professionals, and other stakeholders with an interest in the topic addressed by this policy brief.

Why was this policy brief prepared?

This request was prepared on request from the National Health Systems Resource Centre, India to **inform deliberations** about health policies and programs by **summarising the best available research evidence**.

What is a rapid policy brief?

Rapid policy briefs bring together **global research evidence** to inform local context **and** decisions about health systems and policies by synthesizing and appraising findings from systematic review(s).

A systematic review is a summary of research on the topic addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research to inform decision making.

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Competing interests
The authors do not have any relevant competing interests.

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Ayushman Bharat and the role of mid-level health providers (MLHPs) in India: framing the question

The Government of India, in its bid to achieve Universal Health Coverage, (1) has in 2018 rolled out an ambitious health systems reform plan called *Ayushman Bharat (AB).* The reform has two broad components – a hospitalisation insurance scheme and the transformation of sub- health centres and primary health centres into Health and Wellness Centers (HWC). One key pillar of rolling out the AB-HWC component is the inclusion of new health cadre - referred to as the Mid-level Health Provider (MLHP), defined as "a BSc. in Community Health or a Nurse (GNM or B.SC) or an Ayurveda practitioner, trained and certified through IGNOU/other State Public Health/ Medical Universities for a set of competencies in delivering public health and primary health care services". (2) HWCs are to be resourced by teams led by MLHPs (also called Community Health Officers (CHOs)) who supervise Auxiliary Nurse Midwives (ANMS) and frontline health workers, or ASHAs and will be responsible for delivering the twelve packages of care that India's CPHC program encompasses, namely, pregnancy and childbirth, neonatal and infant health services, childhood and adolescent health services, communicable diseases, non-communicable diseases, elderly and palliative care, oral health care, ophthalmic and ENT care, mental health and emergency medical services. (2)

To help in the design, phasing and implementation of these packages as delivered by MLHPs, this review sought to answer the following Research Question:

> *Are MLHPs as effective as clinicians in delivering (12 packages of) primary health care?*

For the purpose of the policy brief, in order to be able to access relevant international literature, we used the WHO definition of MLHP. The WHO defines the MLHP in a manner similar to national guidelines, as a health provider who is "trained, authorised and regulated to work autonomously, receives pre-service training at a higher education institution for at least 2-3 years and whose scope of practice includes (but is not restricted to) being able to diagnose, manage and treat illness, disease and impairments (including perform surgery, where appropriately trained), prescribe medicines, as well as engage in preventive and promotive care". (3)

Primary health care in this review included the 12 aforementioned domains covered in India's CPHC Program. Effectiveness was assessed for clinical as well as quality of care outcomes in each domain. Over a period of 3 weeks, we collected and analysed seven systematic reviews that met our inclusion criteria and appraised them for methodological quality using the AMSTAR tool. (4) Data was extracted in a standardized template and synthesized. The certainty of evidence was assessed (where relevant and applicable) according to globally established criteria (GRADE criteria); GRADEpro online software was used to create summary of findings tables. (5) A detailed supplementary report has also been prepared which provides details of the methodology, limitations, and implementation considerations as well as the deliberations of a policy consultation related to findings.

Summary of the evidence

MLHPs for care in pregnancy and child-birth (6)

Population: Patients receiving pregnancy and childbirth services including antenatal care
Settings: Primary health care setting in low- and middle-income country
Intervention: Doctor versus nurse/auxiliary nurse or midwife or auxiliary midwife or clinical officer

	Outcomes	Relative effect (95% CI)	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
	Midwives alone versus doctors along with midwives				
Randomised Controlled Trials (RCTs)	Rate of performing caesarean sections	RR 0.94 (0.81 to 1.06)	12144 (8 RCTs)	⨁⨁◯◯ Low[1]	Pregnancy care provided by midwives may slightly reduce the rate of performing caesarean sections (low certainty evidence).
	Postpartum haemorrhage	RR 0.53 (0.25 to 1.14)	8604 (6 RCTs)	⨁⨁◯◯ Low[1,2]	Pregnancy care provided by midwives may reduce postpartum haemorrhage (low certainty evidence)
	Preterm births	RR 0.87 (0.73 to 1.04)	9210 (5 RCTs)	⨁⨁◯◯ Low[1]	Pregnancy care provided by midwives may slightly reduce preterm births slightly (low certainty evidence)
	Use of intrapartum regional analgesia	RR 0.87 (0.81 to 0.93)	9415 (8 RCTs)	⨁⨁◯◯ Low[1]	Pregnancy care provided by midwives may slightly reduce use of intrapartum regional analgesia (low certainty evidence)

	Episiotomies	RR 0.85 (0.78 to 0.92)	13205 (8 RCTs)	⊕⊕◯◯ Low[1]	Pregnancy care provided by midwives alone may slightly reduce in episiotomies (low certainty evidence)
	Quality of Care (QoC)	RR 1.23 (1.10 to 1.37)	826 (1 RCT)	⊕⊕◯◯ Low[1,3]	Pregnancy care provided by midwives may slightly improve quality of care (low certainty evidence)
	Mortality and Access to care	-	-	-	No studies were found that examined these outcomes
	Auxiliary nurse midwives versus doctors				
RCTs	Incomplete abortion	RR 0.93 (0.45 to 1.90)	1032 (1 RCT)	⊕⊕◯◯ Low[1,3]	Pregnancy care provided by auxiliary nurse midwives may make little or no difference in likelihood of an incomplete abortion (low certainty evidence)
	Complications during conduct of manual vacuum aspiration	RR 3.07 (0.16 to 59.1)	2789 (1 RCT)	⊕⊕◯◯ Low[1,3]	Pregnancy care provided by auxiliary nurse midwives may make little or no difference in complications during manual vacuum aspiration. However, the wide 95% confidence interval includes the possibility of both increased and reduced complications (low certainty evidence)
	Post-operative adverse event	RR 1.36 (0.54 to 3.40)	2761 (1 RCT)	⊕⊕◯◯ Low[1,3]	Pregnancy care provided by auxiliary nurse midwives may increase post-operative adverse events, however the 95% confidence interval includes the possibility of both increased and reduced postoperative adverse events (low certainty evidence)
	Clinical officers versus doctors				
Observational studies	Likelihood of early neonatal death	RR 1.40 (0.51 to 3.87)	(1 observational study)	⊕◯◯◯ Very low[4]	It is uncertain whether pregnancy care provided by clinical officers reduces the likelihood of early neonatal death as the certainty of the evidence has been assessed to be very low
	Postoperative maternal health outcomes, such as fever, wound infection, the need for re-operation and maternal death, after emergency obstetric procedures	RR 0.99 (0.95 to 1.03)	(1 observational study)	⊕◯◯◯ Very low[4]	It is uncertain whether pregnancy care provided by clinical officers reduces effect on postoperative maternal health outcomes as the certainty of the evidence was assessed to be very low

[1]Downgraded one level due to serious risk of bias and another two levels due to indirectness (almost all the studies were conducted in tertiary care centres and high income countries)

[2]Downgraded one level due to serious inconsistency (considerable heterogeneity was found)

[3]Downgraded one level due imprecision (single study with a small sample size yielding wide confidence intervals spanning line of no effect)

[4]Quality of evidence was downgraded from Low (observational study design) to Very low due to very serious risk of bias.

MLHPs for neonatal and infant health care services (6)

Midwives versus obstetrician or doctor in team with midwives

Population: Patients receiving neonatal and infant health services
Settings Primary health care setting in low and middle income country Intervention: Doctor versus nurse/auxiliary nurse or midwife or auxiliary midwife or clinical officers.

	Outcomes	Relative effect (95% CI)	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
RCTs	Foetal or neonatal death	RR 0.94 (0.56 to 1.58)	11562 (6 RCTs)	⊕⊕◯◯ Low[1]	Care provided by midwives alone may result in little to no difference in foetal or neonatal deaths (low certainty evidence)
	Clinical outcomes; Quality of care & Access to care	-	-	-	No studies were found that examined these outcomes

[1]Downgraded one level due to serious risk of bias and two levels due to indirectness (almost all the studies were conducted in tertiary care centres)

MLHPs for family planning, contraceptive and other reproductive health care services (7)

Nurses, midwives, doctor assistants, and physician assistants versus doctors

Population: Patients requesting abortion procedures
Settings: Primary health care setting in low- and middle-income country
Intervention: Surgical abortion administered by MLHPs/Medical abortion administered by MLHPs
Comparison: Surgical abortion administered by doctors/Medical abortion administered by doctors

	Outcomes	Relative effect (95% CI)	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
	Surgical abortion procedures				
RCTs	Failure/incomplete abortion	RR 2.97 (0.21 to 41.82)	2789 (2 RCTs)	⨁⨁◯◯ Low[1]	Care provided by MLHPs may increase the chance of the abortion being ineffective or incomplete (more than twice the risk of failure or incomplete abortion for surgical abortion procedures provided by MLHPs when compared to the procedures provided by doctors) (low certainty evidence)
	Complications	RR 0.99 (0.17 to 5.7)	2789 (2 RCTs)	⨁⨁◯◯ Low[1]	Care provided by MLHPs may make little or no difference in complications (low certainty evidence)
	Total complications*	RR 3.07 (0.16 to 59.08)	2789 (2 RCTs)	⨁⨁◯◯ Low[1]	Care provided by MLHPs may increase total complications. However, the wide 95% confidence interval includes the possibility of both increased and reduced risk of total complications (low certainty evidence)

Observational studies	Failure/incomplete abortion	RR 2.2 (1.34 to 3.6)	13,715 (3 observational studies)	⊕◯◯◯ Very low[1,2]	It is uncertain as to whether care provided by MLHPs reduces the risk of failure of incomplete abortion as the certainty of the evidence has been assessed as very low.
	Complications	RR 1.38 (0.7 to 2.72)	13,715 (3 observational studies)	⊕◯◯◯ Very low[1,2,3]	It is very uncertain whether care provided by MLHPs reduces complications as the certainty of the evidence has been assessed as very low
	Total complications*	RR 1.36 (0.86 to 2.14)	16,173 (4 observational studies)	⊕◯◯◯ Very low[1,2,3]	It is very uncertain about the effect of care provided by MLHPs on the risk of total complications.
	Mortality; Quality of Care; and Access to care	-	-	-	No studies were found that examined these outcomes
	Medical abortion procedures				
RCTs	Failure/ incomplete abortion	RR 0.81 (0.48 to 1.36)	1892 (2RCTs)	⊕⊕⊕◯ Moderate	Care provided by MLHPs may slightly reduce the risk of failure/ incomplete medical abortion when compared with that provided by doctors (moderate certainty evidence)
Observational studies	Failure/incomplete abortion	RR 1.09 (0.63 to 1.88)	1164 (1 study)	⊕◯◯◯ Very low[1,2,3]	It is very uncertain about the effect of care provided by MLHPs on failure/incomplete abortion as the quality/certainty of the evidence has been assessed as very low
	Mortality; Quality of Care; and Access to care	-	-	-	No studies were found that examined these outcomes.

*Total complications - incomplete or failed abortion and complications

[1]Downgraded one level due to imprecision and additional one level due to indirectness

[2]Downgraded two levels due to risk of bias and one level for imprecision (wide confidence intervals)
[3]Downgraded one level due to serious risk of bias

MLHPs for communicable diseases (8,9)

Nurses or Clinical Officers versus Doctors

Population: HIV-infected patients
Settings: Primary health care setting in Low and middle income countries
Intervention: Nurse or clinical officer for initiation and maintenance of ART
Comparison: Doctor for initiation and maintenance of ART

	Outcomes	Relative effect (95% CI)	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
RCTs	Initiation and Maintenance of ART Mortality Follow-up: 12 months	RR 0.96 (0.82 to 1.12)	2770 (1 RCT)	⊕⊕⊕⊕High	Initiation and maintenance of ART by a nurse or a clinical officer slightly reduces mortality (high certainty evidence)
	Maintenance of ART Death Follow-up: 12 months	RR 0.89 (0.59 to 1.32)	4332 (2 RCTs)	⊕⊕⊕◯ Moderate[1]	Maintenance of ART by a nurse or a clinical officer makes little or no difference in mortality when ART had previously been initiated by a doctor (moderate quality/certainty evidence)
Observational studies	Initiation and Maintenance of ART Death Follow-up: 12 months	RR 1.23 (1.14 to 1.33)	39160 (2 observational studies)	⊕⊕◯◯ Low[2]	Evidence suggests that there may be an increased risk of death when ART is initiated and maintained by a nurse or a clinical officer when compared to a doctor's care (low certainty evidence)
	Maintenance of ART Death Follow-up: 12 months	RR 0.19 (0.05 to 0.78)	2772 (1 study)	⊕◯◯◯ Very low[3]	It is uncertain whether nurse-led care reduced mortality as the quality/certainty of the evidence has been assessed as very low
	Quality of care and Access to care	-	-	-	No studies were found that examined these outcomes

[1] Downgraded by one level for imprecision due to a wide confidence interval
[2] Rated low because of observational study designs. Not downgraded for risk of bias
[3] Downgraded by one level for imprecision due to low event numbers

MLHPs for non-communicable diseases (10,11)

Non-medical (non-physician health workers (NPHWs) (nurses, pharmacists, allied health professionals, and physician assistants) prescribing compared to medical (doctors) prescribing for chronic disease management in primary care

Population: Patients with non-communicable diseases
Settings: Secondary care and ambulatory/primary care in low-and middle income countries
Intervention: Prescribing by non-physician (doctor) health worker
Comparison: Prescribing by medical doctor

	Outcomes	Mean Difference (MD) (95% CI)	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
RCTs	Systolic blood pressure (mmHg) at 12 months	MD -5.31 mmHg lower (-6.46 to -4.16 lower)	4229 (12 RCTs)	⊕⊕⊕⊕ High	Chronic disease management by non-medical prescribers probably reduces systolic blood pressure (high certainty evidence)
	Glycated haemoglobin (HbA1c, %) at 12 Months	MD -0.62 (-0.85 to -0.38)	775 (6 RCTs)	⊕⊕⊕⊕ High	Chronic disease management by non-medical prescribers reduces the glycated haemoglobin levels (high certainty evidence)
	Low-density lipoprotein (mmol/L) at 12 months	MD -0.21 (-0.29 to -0.14)	1469 (7 RCTs)	⊕⊕⊕◯ Moderate[1]	Chronic disease management by non-medical prescribers probably reduces low-density lipoprotein levels (moderate certainty evidence)
	Health-related quality of life measured with SF-12/36 – Physical component	MD 1.17 (0.16 to 2.17)	2385 (8 RCTs)	⊕⊕⊕◯ Moderate[2]	Chronic disease management by non-medical prescribers probably improves the health-related quality of life (moderate certainty evidence)

	Health-related quality of life measured with SF-12/36 – Mental component	MD 0.58 (-0.40 to 1.55)	2246 (6 RCTs)	⊕⊕⊕◯ Moderate[1,2]	Chronic disease management by non-medical prescribers probably reduces health-related quality of life (mental component) (moderate certainty evidence)
	Mortality	-	-	-	No studies were found that examined this outcome
	Access to care	-	-	-	Several studies reported improved access to healthcare at the community level, although the metric to evaluate access was often not described. Data was not reported and the evidence was not assessed according to GRADE criteria.

[1]Downgraded one level due to serious inconsistency (considerable heterogeneity was found)
[2]Downgraded one level due to indirectness (prescribing component effect on quality of life difficult to determine)

MLHPs for mental health (12)

Non-specialist health workers (NSHWs) (midwives, nurses and community health workers) versus mental health specialists

Population: Women with perinatal depression
Settings: Primary care in low-and middle income countries
Intervention: Non-specialists health workers (midwives, nurses and community health workers)
Comparison: Mental health specialists

	Outcomes	Impact	No of participants	Certainty of the evidence (GRADE)	Plain Language Summary
RCTs	Perinatal depression assessed using Edinburgh Postnatal Depression Scale (EPDS), the Center for Epidemiological Studies Depression Scale (CES-D), Beck Depression Inventory (BDI), the General Health Questionnaire (GHQ), Hamilton Depression Rating Scale (HDRS) Follow up: range 6 weeks to 3 years	All nine studies reported statistically significant improvements in perinatal depression in the intervention groups compared with control groups. The estimates were presented differently for different measurement scales and at different follow up periods.	14555 (9 RCTs)	-	Only narrative synthesis was conducted for the systematic review and no pooled estimate was available. The results suggested that NSHWs can feasibly provide mental health services leading to improvement in perinatal depression scores, particularly in low-resource settings where specialist services are both scarce and expensive. Certainty of evidence by GRADE was not assessed for it due to paucity of information in the published SR.
	Mortality; Quality of care and Access to care	-	-	-	No studies were found that examined these outcomes

No systematic reviews assessed the role of MLHPs in the provision of following health services.

MLHPs for childhood and adolescent health services

MLHPs for ophthalmic and ENT conditions

MLHPs for elderly and palliative health care

MLHPs for emergency medical services

Conclusion

The utilisation of MLHPs via Ayushman Bharat's HWCs is seen as a key strategy to help address shortage of medical doctors, particularly in rural areas and contexts requiring last mile care. Given their shorter durations of training and lower salaries, MLHPs deployment may be viewed as a short term option to resource areas lacking physicians. However, to date, there has been no comprehensive synthesis of available evidence on the effectiveness of MLHPs relevant to the Indian context. This rapid policy brief is based on rapid synthesis of evidence from systematic reviews on the issue and aims to inform decision makers and identify knowledge gaps. The majority of the evidence comes from high-income countries and from African nations, as the use of MLHPs was long-established in many of these countries.

The findings from the policy brief showed that there is some evidence regarding the beneficial effects, acceptability and feasibility of using MLHPs for pregnancy and childbirth care, communicable and NCDs in LMICs but the certainty of evidence is not high or even moderate for many cases. Many health systems outcomes have not been studied. Critically, little is known about across the system level impacts of the introduction of MLHPs, including their functioning as teams. The evidence around the delivery of mental health services by MLHPs is only for perinatal depression; even as there may be individual studies reporting the use of MLHPs for other mental health conditions. There is a lack of evidence from systematic reviews in relation to MLHPs for childhood and adolescent health services, oral health care, elderly and palliative care, ophthalmic and ENT conditions, and emergency medical services. There is a need for conduct of evidence synthesis and further primary research in these domains of health care, particularly in LMIC settings, assessing a broad range of impacts to population level health as well as system responsiveness.

This evidence synthesis is limited in that only reviews from 2013-2016 were included, given the short time span allocated. Further, the global literature defines MLHPs in a different way from how they are envisioned in India, and the evidence also applies to rather different settings, which required us to downgrade the quality of the evidence due to its indirectness. This is a key area for further research.

Ancillary evidence suggests that appropriate integration into staff structures, adequate pay, and ongoing support and supervision, is required for successful implementation of MLHPs has been suggested by many stakeholders. (3,8,10,11) Evidence also suggests a national framework can help ensure harmonisation and stability for the delivery of healthcare services by MLHPs, (3) which is the direction in which India is headed in many states. However, considering the lack of high certainty evidence applicable to our context, it is essential to have monitoring, learning, and comparative effectiveness research embedded within program rollout as part of implementation and scale-up. Further studies are required to look at the cost-effectiveness and equity dimensions of services provided by MLHPs.

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