A step towards real-time implementation of GDM guidelines in India: Review of Gaps in RCH Programme

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Abstract

Gestational Diabetes Mellitus (GDM) risks the affected mother-child duos not only with respect to adverse perinatal outcomes but also for chronic diseases later in life. Therefore, in 2014, the Government of India (GoI) mandated universal GDM screening for all pregnant women as a part of essential obstetric care within the Reproductive and Child Health (RCH) programme. Later in 2018, the domain experts from GoI envisaged pan India implementation of GDM screening services within its RCH framework by 2023. As Uttarakhand—a hilly, EAG state of north India—would also be part of this nation-wide drive; prior identification of RCH services coverage in the State assumes paramount importance, as it reflects probable executability of GDM screening services within its delivery platform. Therefore, the present review aims to assess the readiness of Uttarakhand maternal health functionary system in view of GDM national guidelines implementation at both state and district levels. In this regard, freely accessible, full-text GoI documents pertaining to GDM implementation guidelines and maternal health program of India and Uttarakhand available in public domain in English language were reviewed. The present review favors the pilot implementation in district Dehradun prior to implementing in all districts of the state. It may, however, require overall improvement in maternal health programmatic services in all parts of the State for much efficient service delivery. Effective implementation of GDM guidelines requires urgent correction in the background performance of RCH program.

Keywords: Empowered Action Group State, Hyperglycemia in Pregnancy, Maternal Health, Reproductive and Child Health Programme, Uttarakhand

Introduction

Pregnancies afflicted with abnormal hyperglycemia place large population subset at high-risk for adverse perinatal morbidity and mortality.[1,2] Presently, the International Diabetes Federation 2019 estimates 20.4 million of global live births (15.8%) to women with hyperglycemia in pregnancy (HIP).[3] HIP is associated with various obstetric complications, viz., postpartum hemorrhage, obstructed labor, pre-eclampsia, etc., that indirectly contribute to high perinatal mortality risk if diagnosis goes missed or left inappropriately managed.[4] Beyond perinatal implications, HIP is also considered precursor for most chronic diseases.[3] Unlike most obstetric conditions that usually resolve following delivery, HIP marks the beginning of Type-II DM and

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obesity's vicious cycle among the affected mother-child duos. Therefore, all HIP women require meticulous blood glucose control monitoring much prior to conception that continues throughout pregnancy.

More than 80% (83.6%) of global HIP cases are due to gestational diabetes mellitus (GDM).[3,5] India, as per a recent systematic review and meta-analysis, is reporting a pooled GDM prevalence of 8.9% (95% confidence interval (CI) 7.1–11.1) ranging widely (nil to 41.9%) across all the states.[6] Prior to 2014, maternal screening of abnormal HIP was never a part of essential obstetric package.[4] Amidst lack of standard diagnostic protocols, the condition was going mostly undiagnosed at population-level. As India been recognized as the second largest epicenter of global diabetes crisis[3] with second highest contributor of global maternal deaths,[7] early recognition of abnormal HIP assumes national importance.

On 12 April 2005, the government of India (GoI) launched National Rural Health Mission (NRHM) for providing quality health services to rural population; with special focus on eighteen high-fertility states including Empowered Action Groups (EAG).[8] Since then, the GoI has been implementing Reproductive and Child Health (RCH) programme-II under its three-tier service delivery model to reduce maternal deaths.[8] In 2008, GoI also launched National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS) to check the ongoing rise in DM epidemic.[9] Following addition of an urban component, both RCH-NPCDCS were brought under the common National Health Mission (NHM) flagship.[10] Under NHM in 2014, the GoI released national guidelines that mandated universal GDM screening for all Indian pregnant women as a part of routine antenatal package.[4] Later in 2018, the GoI released technical guidelines establishing execution methods in these guidelines. It emphasized on nation-wide rolling-out of operational services for GDM in population under NHM.[11] It seeks to cover entire Indian rural population in phases, following integration of RCH-NPCDCS delivery platform, providing pan India coverage by 2023 A.D.[11] Table 1[11] summarizes about the involved healthcare personnel under RCH-NPCDCS in delivering their responsibilities for guidelines implementation at district level.

Presently, RCH is receiving maximum attention under NHM.[8] With Uttarakhand state's health functionary receiving special support from NHM by virtue of EAG status,[12,13] it continues to be the second-highest contributor to country's overall maternal deaths (MMR = 285) in 2011–2013.[8] As previous data on GDM burden in state is still unknown, the present implementation of guidelines will also assist in identifying its true burden in Uttarakhand. But as implementation is based on RCH platform, its successful execution is dependent on existing quality of RCH service in the country. Therefore, the present review aims to assess the readiness of Uttarakhand maternal health functionary system viz., RCH, in view of GDM operational guidelines implementation, at both state and districts level. The authors hypothesize that effective implementation of all proxy measures under RCH, viz., infrastructure availability, adequate financial and logistics management with quality of maternal health services/indicators—can predict effective future delivery of GDM services in population much prior to its real-time implementation.

Materials and Methods

Freely accessible, full-text GoI documents from 2001-20, available in PubMed, Google Scholar and GoI websites in English language pertaining to GDM implementation guidelines and RCH programme of India and Uttarakhand were reviewed.

Results and Discussion

Baseline socio-demographic profile

Uttarakhand is a hilly state situated in Himalayan belt of northern India that shares international boundary with China and Nepal and is spread over a geographical area of 53,483 km^2; with >85% area in hilly regions, the state harbors ~0.8% of country's population (100.86 lakh in Census 2011).[14,15] [Figure 1] The state, formed in the year 2000 following carved out Himalayan districts from Uttar Pradesh, has presently two administrative divisions (Garhwal and Kumaon) which overall encompass 13 districts. The state is divided into three geographical zones: (i) Upper-hills with difficult terrain and scarce population, (ii) Mid-hills, and (iii) Foot-hills which predominately fall in plains and are densely populated.[16] Its overall literacy rate is 79.6% and sex ratio 963.[15] In the National Institute of Transforming India (NITI) Ayog 2019 report, Uttarakhand's rank has plunged to 17th position owing to poor performance in cumulative Health Index scoring <43.74 and is again grouped among poorest performing bottom one-third aspirant states of India.[12] Since 2001, the state has been identified as one among EAG states.[12]

Maternal health indicators

As per the recent Sample Registration System's Special Bulletin on Maternal Mortality in India released in November 2019, Uttarakhand has shown a steep drop in MMR trends (MMR = 89; 95% CI: 42–137) during 2015–2017 which is much below the national average (MMR = 122; 95% CI: 112–133) [Figure 2].[17] With recent maternal mortality rate of 5.9% during 2015–2017, the state is showing lower life-time risk (0.2%) of at least one woman in reproductive age-group dying due to child birth/puerperium compared to national figures (0.3%).[17] However, Uttarakhand is showing worrying rising trends in obstetric complications during delivery from 7.4% (2011–2012) to 9.8% (2015–2016).[8,12]

HIP burden

Despite being a common medical obstetric condition with proven temporal relationship with Type-II DM, national data on HIP prevalence and its secular trends in India are still lacking. Not a single community-based study appears to have been carried out for representative population of Uttarakhand so far.[6] It is

Table 1: Role of Health Personnel involved at Different Levels of Health Facility[11]

Level of Health Facility	Health Personnel Involved	Responsibilities
Village	ASHA	GDM awareness generation, line listing of all pregnant women, and mobilization of antenatal clients on VHND/ANC OPD day for timely testing and follow up
VHND	ANM	Performs OGTT testing and records results in MCP card and ANC register Identify GDM positive women and record in follow-up register for management Counsel for MNT, physical activity and follow-up schedule on same day of diagnosis Refer those needing medical management therapy Prioritize home visits for left out pregnant women for OGTT testing On negative test, counsel about second test
Level I: Subcentre	ANM	All jobs as defined under VHND. In addition, maintains records, monitors, and follow up
Level II: PHC/ Urban-PHC	MO/SN/ANM/lab Technician	Undertake activities as per their defined job profile and training Counsel and performs OGTT testing Counsel for MNT, physical activity and follow-up schedule on the same day of diagnosis, Those controlled on MNT are delivered by ANM/SN Initiate medical therapy after assessing MNT compliance, those controlled on medical therapy are delivered by MOs Counsel for postpartum family planning, 6 weeks' postpartum follow up for OGTT, Encourage early breastfeeding and assess the condition of mother before discharge. Monitor blood sugars of newborn to identify hypoglycemia, and manage appropriately Refer those uncontrolled on medical therapy/with complications to higher centre for specialist care Maintains records, monitors, and follow up
Level III: District Hospitals and CEmOC centres	Specialist/gynecologist/ MO	All jobs as defined under Level II. In addition, management of all types of GDM cases
NCD Clinic	NCD staff	Educate client, screening, diagnosis and treatment of DM, Refer difficult or complicated cases to district hospitals

Abbreviations: GDM: Gestational diabetes mellitus; MOs: Medical officers; DM: Diabetes mellitus; NCD: Noncommunicable diseases; CEmOC: Comprehensive emergency obstetric care services; OGTT: Oral glucose tolerance test; MNT: Medical nutrition therapy; ANM: Auxiliary Nurse Midwife; SN: Staff Nurse; MCP: Mother child protection; ASHA: Accredited Social Health Activist; OPD: Outpatient department; PHC: Primary healthcare; VHND: Village health and nutrition day; ANC: Antenatal care

probable that along with other causal factors, GDM might also be potentially contributing to state current MMR trends. Due to lack of standard protocols, GDM might be going unnoticed during antenatal period in Uttarakhand with complications mostly encountered at and around the time of delivery resulting in state's rising trends in obstetric complications during delivery. Data were, however, available from few hospital based studies; few carried out in district Nainital at a tertiary-level medical college.[18,19] These studies have reported GDM prevalence as 0.3% or 16%;[18,19] findings that cannot be extrapolated to this unique hilly-plains demographic region.

Performance review of RCH program

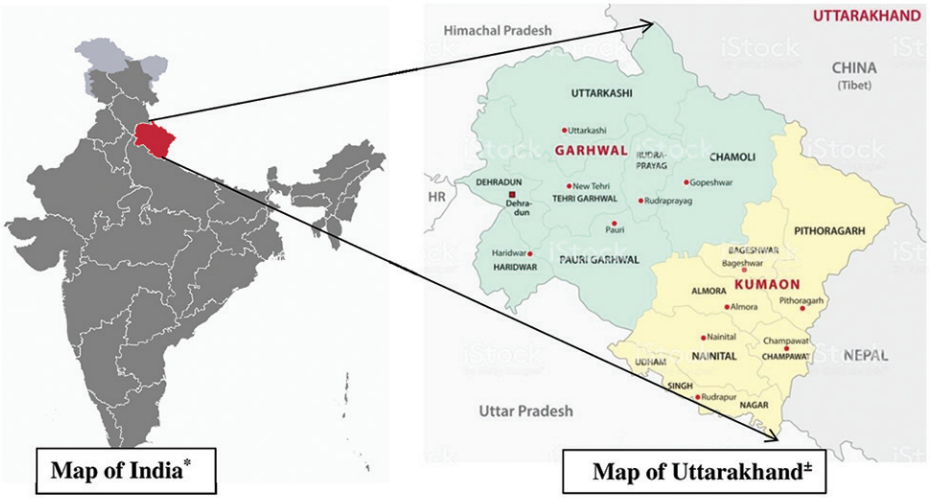
Following nation-wide launch of NHM, Uttarakhand State Health Mission (UK-SHM) was formally inaugurated on 27 October 2005.[20] Figure 3 illustrates the functioning of NHM in any representative state/district in India. Accordingly, UK-SHM is also functioning through Uttarakhand Health and Family Welfare Society (UK-HFWS). The society is bringing operational efficiencies in effective implementation of all programmes including RCH under its cover.[21] It ensures smooth and effective fund flow, proper reporting with monitoring of all NHPs as per central/state NHM directives.[21] Being an EAG, Uttarakhand receives NHM funds from center in 90:10 ratio unlike other non-EAG states which receives in 60:40 ratio.[8] The percentage share of central funds released to UK-HFWS under RCH flexible pool has improved from 1.5% in 2011–2012 to 2.6% in 2014–2015.[22] In addition, the UK-HFWS also seeks additional support from external funding agencies viz., United States Agency for International Development.[21] Under NHM, states are being additionally incentivized—up to 5% of their total outlay—to establish systems for free distribution of essential drugs, robust procurement system, etc., The amount so received by state government is ideally disbursed to UK-HFWS within 15 days of their receipt.[8] UK-HFWS further releases it to individual program officers posted at district health societies (DHSs) [Figure 3]. DHSs extends it to its subordinate blocks which is further disbursed to its implementing units, viz., district hospital, community health center (CHC), primary health center (PHC), sub-center (SC), and village health sanitation and nutrition committee.[21]

Funds management

Effective GDM screening guidelines implementation in any district requires financial support and smooth fund flow to its implementing units. However, financial management under RCH at state level is reportedly not satisfactory.[8] UK-SHM has reported a delay of almost four months in 2017-2018 in transferring funds to UK-HFWS.[12] Even with the amount received, there has been proportional rise in the amount of unspent funds as well [42% in 2011-2012 rising to 49% in 2013-2014].[8]

Availability of physical infrastructure

For effective GDM-related services implementation in any district requires well-equipped functional support of



S. No.	Administrative Divisions of Uttarakhand	Total No. of Districts (N=13)	Name of Districts	Zones
1.	Garhwal	07	1. Uttarkashi	U-H
			2. Chamoli	U-H
			3. Rudraprayag	U-H
			4. Tehri Garhwal	M-H
			5. Pauri Garhwal	M-H
			6. Dehradun*	F-H
			7. Haridwar*	F-H
2.	Kumaon	06	8. Pithoragarh	U-H
			9. Bageshwar	U-H
			10. Almora	M-H
			11. Champawat	M-H
			12. Nainital	M-H
			13. Udham Singh Nagar*	F-H
*Located in Plains; remaining districts are situated in hilly regions				
Abbreviations: U-H: Upper hills; M-H: Mid hills; F-H: Foot-hills				

Source:
*Available at: https://upload.wikimedia.org/wikipedia/commons/d/de/IN-UT.svg
±Available at: https://nl.wikipedia.org/wiki/Bageshwar_(district)#/media/Bestand:UttarakhandDistricts.png

Figure 1: Zone-wise distribution of 13 districts within the two administrative divisions of Uttarakhand, North India

infrastructural facilities under RCH [Table 1]. But as per Indian Public Health Standards (IPHS) standard norms for hilly-plain regions, the state continues to show shortfall of ~50% in the availability of SCs, PHCs, and CHCs.[8] Among those available, only 23% SCs, 53% PHCs and 50% CHCs are upgraded to IPHS, respectively.[8] More than half of PHCs do not have the facility for delivery; while only 50.5% PHCs are functional 24 × 7; 65% PHCs are functioning as FRUs.[8] Under MoHFW's grading system, one-tenth (11.8%) of CHCs in state are able to score ≥4 points for satisfactory service utilization, client orientation, service availability, drugs and supplies, human resources and infrastructure.[12] But most instances of inaccessible and unhygienic inaccessible healthcare facilities remain a cause of concern.[8] Less than one-fifth of SCs (16.9%), PHCs and CHCs (16.3%) are running without ANMs and staff nurses, respectively.[12] Around 40% PHCs are functioning without primary care physicians whereas 68% district hospitals are running without specialists.[8] Though Uttarakhand has achieved targets of new health facilities construction during 2011-2016, the buildings are yet to be functional due to improper location, poor road connectivity etc., in present.[8]

Availability of medicines/equipments

Effective GDM screening services in any district requires uninterrupted availability of essentials like plasma calibarated glucometer, gluco-strips, lancets, glucose packets/pouches, human prefix insulin with syringes, metformin, etc., in health centers under RCH. But in Uttarakhand, there have been previous episodes of many essential equipment lying under-utilized primarily due to non-availability of trained manpower or lack of adequate space for their operation, etc.[8] Non-availability of other previously mentioned essential medicines/consumables under RCH viz., essential obstetric kits, Vitamin-A, contraceptive pills, ORS packets etc., in selected health facilities remains the

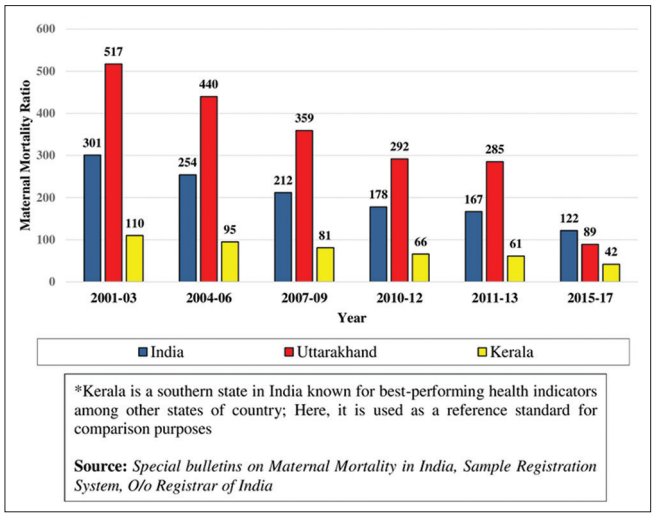


Figure 2: Slow Declining Trends of Maternal Mortality Ratio in Uttarakhand compared to India and Kerala*

cause of concern.[8] Operationalization of Mobile Medical Units (MMUs) services in hilly terrain like Uttarakhand are largely lacking.[8] Patient transport ambulances, another important service, operating under dial 108/102 ambulance services are reported mostly deficient in state due to delayed response time or in some instances not attending calls, etc.[8]

Quality of healthcare

The standard NHM recommendations require each state to constitute State Quality Assurance Committee (SQAC), supported by State Quality Assurance Unit (SQAU), for providing overall guidance, mentoring, monitoring, and implementing quality assurance activities in state. SQAC performs certain mandated activities like holding half-yearly review meetings, monitoring key performance indicators (KPIs), etc.[8] This service is likely to also ensure effective GDM service delivery in any district. But District Quality Assurance Unit (DQAU), primarily responsible for rolling-out standard RCH service protocols in respective districts, are yet to be constituted in Uttarakhand. There is also an absence of periodic internal assessment at selected health facilities in Uttarakhand. Hospital managers are required to collate critical data from departments and compute KPIs for monitoring/reporting on monthly basis to DQAC and SQAC. But in Uttarakhand, KPIs are going reportedly unmonitored. Resultantly, there is no mechanism to identify gaps in health services quality within the facility. At village, block and district levels, monitoring committee is yet to be constituted that monitors and validates the data sent to higher authorities by ANM and other functionaries of public health system.[8]

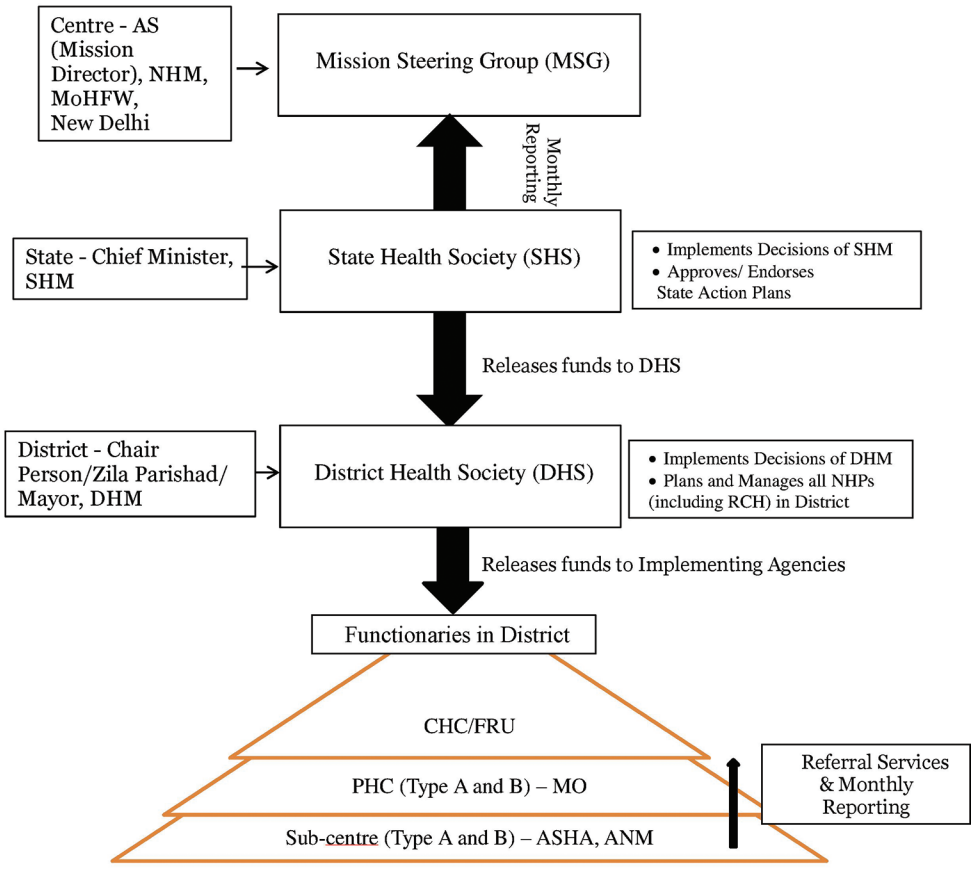
Coverage of GDM-related maternal health services

Table 2 highlights baseline coverage of key indicators under RCH in state. One of the major intervention is to register all pregnant women within first trimester and provide full antenatal care; the latter covers minimum four antenatal check-ups (ANC), two tetanus toxoid vaccine doses, 100 iron folic acid tablets/adequate amount of syrup consumed during pregnancy, proper diet, and vitamin supplements. For efficient implementation of GDM national guidelines, this indicator assumes paramount importance for achieving universal GDM screening in a rural population. But as seen, around one-tenth of pregnant women (11.5%) are able to receive full antenatal care with less than half (41.2%) completing four minimal ANC visits. Less than two-thirds (63.1%) of pregnant women receiving antenatal check-up in first trimester.[23] All these proportions are quite away from the set benchmark indicators of Kerala.[24]

Another primary objective of RCH is to achieve universal institutional delivery (100%). As per guidelines, a GDM woman on medical management requires strict blood sugar monitoring during labor using glucometer. Therefore, universal institutional delivery is promoted and vaginal delivery is preferred. However, universal institutional delivery is yet to be fulfilled by Uttarakhand maternal health system (79.0%) [Table 2]. To encourage institutional delivery, Janani Suraksha Jojana (JSY) scheme was launched to provide cash assistance to pregnant women for every institutional delivery in public health facilities. Despite this, the proportion of institutional deliveries occurring in public health facilities of Uttarakhand still persists to remain below half (42.3%).[23] These rates are surprisingly even worse in Kerala (38.3%).[24] Under JSY, less than half of the antenatal women (41.4%) in Uttarakhand were able to receive cash assistance for institutional births.[23]

As per RCH-II guidelines, most obstetric complications and maternal deaths occur during delivery and within first 48 hours after childbirth. This makes intra-partum phase indeed the most crucial for recognizing and early responding to obstetric complications. The best way to do so is to maximize facility-based deliveries or skilled attendance during home births in "difficult-to-reach areas", referring women for emergency care in case complications ensues. In Uttarakhand, only two-thirds (66.1%) of mothers are able to receive postnatal care from healthcare personnel within two days of delivery [Table 2].[23] Kerala (49.1%) is seen performing even worse than Uttarakhand in postnatal care.[24] Visibly, urban areas are performing comparatively better in most indicators than in rural areas [Table 2].

The district-wise coverage of key indicators within Uttarakhand under RCH program is detailed in Table 3.[25] Various development indicators have shown plains districts are doing comparatively better than those in hilly region. This is primarily due to mountain-associated shortfalls that perpetuate impediments to hills development, a dominant characteristic of hilly regions.[16] It can be further inferred from Table 3 that district Dehradun (foot-hills) is not only leading in most indicators in antenatal care, institutional deliveries, and post-natal care among other districts but is also performing much above the state average. This seemingly favors at-least initial pilot implementation of GDM national guidelines in district Dehradun prior to complete rolling out in remaining districts [Table 3]. Though,



Abbreviations:
AS: Additional Secretary; **ANM:** Auxiliary Nurse Midwife; **ASHA:** Accredited Social Health Activist; **CHC:** Community Health Centre; **DHM:** District Health Mission; **FRU:** First Referral Unit; **MO:** Medical Officer; MoHFW: Ministry of Health and Family Welfare; **NHM:** National Health Mission; **NHP:** National Health Programme; **PHC:** Primary Health Centre; **RCH:** Reproductive and Child Health Programme; **SHM:** State Health Mission

Figure 3: Organogram of National Health Mission (NHM) (earlier NRHM)

Table 2: Coverage of Key Interventions under RCH Programme in Uttarakhand

Phase	Key interventions	Kerala (Total) (%)	Uttarakhand		
			Total (%)	Rural (%)	Urban (%)
Ante-natal	Mothers receiving full antenatal care	61.2	11.5	9.0	15.6
	Mothers having minimum required 4 ANC visits	90.1	41.2	25.7	30.9
	Mothers having ANC check-up in first trimester	95.1	63.1	48.7	53.5
Intra-natal	Institutional Delivery	99.8	79.0	63.7	68.6
	Institutional births in Public Health Facilities	38.3	42.3	44.5	43.8
	Births assisted by a doctor/ nurse/LHV/ANM/other health personnel	99.9	81.5	66.3	71.2
	Births delivered by caesarean section	35.8	19.3	10.2	13.1
	Births in a public health facility by caesarean section	31.4	13.2	7.5	9.3
	Mothers received financial assistance under JSY for institutional births	20.4	41.4	54.2	49.4
Post-natal	Mothers who received postnatal care from a doctor/ nurse/ LHV/ ANM/ midwife/ other health personnel within 2 days of delivery	49.1	66.1	49.1	54.8

Source: National Family Health Survey (NFHS)-4 State Fact Sheet (2015-16). Abbreviations: ANC: Antenatal care; ANM: Auxiliary nurse mid-wives; LHV: Lady health visitor

this may also require overall improvement in RCH programmatic services in all districts for much efficient service delivery.

To summarize, the present review identifies the scope for major improvements in almost all proxy measures of RCH within Uttarakhand. Comprehensive compilation of data available from Uttarakhand and its state-specific districts is the main highlight of the study. GDM implementation is still in pilot phase in most parts of India, and health providers are currently undergoing field training in GDM management. The findings from the present

Table 3: District-wise coverage of key indicators under RCH programme in Uttarakhand

Phase	Indicators	UK	District-wise											
			Plain Districts			Hilly Districts								
		Total (%)	DDN	HDR	USN	NNTL	PGR	PG	TG	RPG	UKS	ALM	CML	BGR	CM-WT
Ante-natal	Mothers receiving full antenatal care	11.5	18.9	7.6	5.8	20.5	14.7	11.9	7.2	5.7	9.6	18.7	5.9	10.7	11.1
	Mothers having minimum required 4 ANC visits	41.2	47.1	24.2	26.6	40.4	30.8	36.4	23.8	17.2	22.2	31.7	20.3	23.4	29.0
	Mothers having ANC check-up in first trimester	63.1	71.9	42.6	46.4	65.7	49.9	61.4	53.8	55.5	43.8	57.7	49.2	42.0	43.7
Intra-natal	Institutional Delivery	79.0	83.7	62.8	67.5	64.5	73.0	74.5	71.1	66.5	65.1	66.3	53.3	55.9	73.3
	Institutional births in Public Health Facilities	42.3	49.5	23.8	39.6	41.1	65.3	59.7	59.4	59.8	58.9	57.8	49.4	49.6	54.1
	Births assisted by a doctor/ nurse/ LHV/ ANM/ other health personnel	81.5	85.2	63.6	72.2	70.2	75.6	74.9	71.9	67.6	65.5	69.6	61.8	62.3	74.0
	Births delivered by caesarean section	19.3	16.6	13.0	14.2	24.6	7.3	11.0	8.0	10.5	4.7	8.7	4.7	8.7	13.0
	Births in a public health facility by caesarean section	13.2	9.4	10.1	8.0	22.9	6.0	5.0	7.2	12.6	5.0	9.1	7.4	10.8	5.5
	Mothers received financial assistance under JSY for institutional births	41.4	50.0	30.2	40.8	44.3	81.6	60.9	64.9	62.7	79.2	60.8	67.1	76.8	50.3
Post-natal	Mothers who received postnatal care from a doctor/nurse/LHV/ANM/ midwife/other health personnel within 2 days of delivery	66.1	68.6	52.7	46.4	59.5	56.4	56.3	52.7	57.5	45.6	58.0	47.9	42.1	53.7

Source: National Family Health Survey – 4. District Fact Sheets: Uttarakhand (2015-16). Abbreviations: ALM: Almora; ANC: Ante-natal Check-up; ANM: Auxiliary Nurse Midwife; BGR: Bageshwar; CML: Chamoli; CM-WT: Champawat; DDN: Dehradun; HDR: Haridwar; LHV: Lady Health Visitor; NNTL: Nainital; PG: Pauri Garhwal; PGR: Pithoragarh; RPG: Rudraprayag; TG: Tehri Garhwal; UK: Uttarakhand; UKS: Uttarkashi; USN: Udham Singh Nagar

review will serve as a template to the state health policy makers/ administrative bureaucrats in identifying areas of improvement within RCH program for maximizing the benefits following implementation of community-based GDM screening.

Relevance to Primary Care Physicians

With rising prevalence of GDM, it is pertinent for physicians of all cadres aware of disease screening and diagnosing guidelines, methodology for treatment protocols in community and criteria for prompt referral to higher settings. GDM is considered precursor for Type II DM; most GDM subjects can be managed within the community. Identification of its risk factors, advocating health promotion strategies and screening guidelines are to be implemented within primary healthcare level. Besides RCH/NHM providing administrative and financial support, its successful implementation depends on knowledge and commitment level of health-care providers also. Active role of primary care physicians, along with primary health-care teams, for achieving universal GDM identification in community and ensuring adequate management is of paramount importance. In addition, their responsibility in ensuring compliance and health education interventions will also help improve outcomes. These tasks have to be inherently placed within the existing comprehensive skill set and clinical roles of primary health-care teams. Uniform guidelines will, thus, be useful for training primary care health providers to achieve above objectives; community-wide successful implementation of screening program can then become a reality.

Conclusion

Effective implementation of GDM national guidelines in India requires urgent correction in the background performance of RCH program in one of its EAG state, Uttarakhand. Deficiencies in any form can deprive beneficiaries of the intended healthcare, hampering overall effective delivery under operational guidelines to any extent. Therefore, financial management under program needs urgent improvement at state level. Timely transfer of funds and economical utilization at district level is the need of hour. Improving availability and quality of healthcare amenities will improve quality of healthcare service delivery. Effective inventory management of drugs will avoid sudden out-of-stock circumstances. Operationalization of all MMUs and ambulances, well-equipped with required manpower and paraphernalia, will serve as a boon for especially those living in mid and upper-hills zones. Presence of functional quality committees/units will assess service quality of ante-natal, intra-natal and post-natal care provided under RCH. If program is efficiently implemented within the state, they will pay later in recovering/improving overall maternal health indices of India.

Limitations of the Study

Data compilation and reporting usually takes long time, therefore, poor coverage on real-time data is a possible limitation of the study. There is also missing information on hard-to-reach areas of Uttarakhand which remain unaddressed in the present review.

Highlights of the Study

1. Effective implementation of guidelines requires major improvements in almost all proxy measures of RCH within Uttarakhand.
2. Comprehensive compilation of Uttarakhand/districts-specific data is the main highlight of the study.
3. GDM implementation is still in pilot phase in most parts of India. Findings from present review will serve as a template to state health policy makers/administrative bureaucrats in identifying areas of improvement within state's RCH for maximizing the benefits following community-based GDM implementation.

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Conflicts of interest

There are no conflicts of interest.

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