

## MEETING THE PRIMARY HEALTH CARE NEEDS OF RURAL ASSAM THROUGH INTRODUCTION OF A MID—LEVEL HEALTH WORKER: LESSONS FROM INDIA’S EXPERIENCE WITH RURAL HEALTH PRACTITIONERS

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### ABSTRACT

**Background:** The introduction of a three years Diploma in Medicine and Rural Health Care (DMRHC) course in 2005 under the purview of Assam Public Health Act has lead to augmentation of human resources through deployment of Rural Health Practitioners (RHPs) in Assam, India.

**Objectives:** The study aimed to understand the performance of Sub-Centers (SCs) in terms of ranges, uptake and quality of primary health care services in SCs with and without RHPs over consecutive three years since deployment of RHPs at Health Sub-Centers (HSCs) in April, 2008.

**Methods:** We used mixed research method i.e. qualitative technique complemented by quantitative analysis of data. Purposive sampling method was adopted for selection of HSCs in High Focus Districts (HFDs) where RHPs were deployed. Key Informant (KI) interviews were conducted comprising of RHPs, Auxiliary Nurse Midwives (ANMs), beneficiaries and government officials to gain perspectives about RHP model, service delivery and challenges etc. Semi structured, open-ended questionnaires were used for KI interviews and checklists for community group discussions.

**Results:** Performance of HSCs with RHPs has improved substantially in terms of management of Out Patient Department (OPD) cases and institutional deliveries as compared to HSC without RHPs over the years from 2010-11, 2011-12 and 2012-13. RHPs cited DMRHC was apt for serving the rural population. Key challenges include lack of referral transport, housing and promotion avenues. ANMs, beneficiaries and community perceptions of RHPs are positive in terms of managing increased number and types of common ailments, drugs availability, improved care, proper referral and initiation of institutional deliveries. RHPs had gained community's confidence in service delivery at HSC.

**Conclusions:** Replication of RHP model is critical for improved rural health care systems, provided supervisory and support mechanisms are streamlined. Recognition of DMRHC, upgrade to a Bachelor's degree course and creation of regular cadre is necessary for sustainability of rural health systems.

**Key words:** Diploma in Medicine and Rural Health Care, Rural Health Practitioners, Assam Public Health Act, Health Sub-Centers

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### INTRODUCTION

Coverage of health care services is proportionate to the numerical adequacy of skilled health workers providers (doctors, nurses and midwives). As per international norms, 228 skilled health providers per 100,000 population is required to achieve a minimum 80% coverage of deliveries by skilled birth attendants or for measles immunization<sup>1</sup>. Many countries including India have achieved health indices of international standards with much lower doctor population ratio<sup>2, 3</sup>. The ratio shows wide variations across countries with India having only 119 skilled health providers per 100,000 population<sup>3</sup>. Still, hardly 40% of these health workers provide services to rural population which is nearly 69% of the country's population<sup>4</sup>. Skewed distribution of health workers and density of allopathic

physicians varies widely across urban and rural areas as only 19 of these physicians are serving 100,000 rural populations as against 113 of them serving urban population<sup>5</sup>. The shortage of healthcare professionals in rural communities remains an intractable problem that poses a serious challenge to equitable healthcare delivery<sup>6</sup>. The wide discrepancy between health needs and service provision of rural population is captured by Hart's 'inverse law', which states that those with the greatest health needs usually have the worst access to health care services<sup>7</sup>. International experience suggests that mid-level health workers have played an important role in addressing human resources shortages and improving health care access and equity, especially in low and middle -income countries<sup>8-9</sup>. There is growing recognition that skilled mid-level health care workers can play a major role in community

mobilization and in delivering a range of health-care services<sup>10</sup>. Education strategy was one of the measures for retaining them with an aim to admit only those students who are likely to serve in under-served areas and mould education to retain the commitment.<sup>1, 11</sup> Indian states have also introduced these education strategies to address these huge crises of shortages of health workers, particularly in the rural, remote and underserved areas by giving preferential selection of workers with rural backgrounds for medical/nursing education<sup>11</sup>. In such state, like Chhattisgarh having the lowest human resource densities in India, had introduced the three years course to train medical professionals, to serve in rural areas and address the acute crisis of shortage of physicians at the end of 2002. The Chhattisgarh Government had selected and deployed 225 Rural Medical Assistants (RMAs) in most Primary Health Centers (PHCs) to provide primary health services by 2008. As of June 2010, 834 RMAs (including 400 women RMAs) have been placed in Primary Health Centers (PHC) across the state. The preliminary report on assessment of professional skills of RMA, on comparison with other alternatives was positive<sup>12</sup>. Employment of these graduates with three years course, at Health Sub-centers, had upgraded the sub-optimally functional SCs to a fully functional, curative center apart from a center providing only preventive and promotive health services<sup>13</sup> and therefore this strategy is considered as the best alternative. Based on the lessons learnt, Assam state having one of the highest maternal and infant mortality rates in India<sup>14-15</sup> and death of skilled health workers, had introduced a similar three years course in 2010-11 with legal support<sup>13-14</sup> for providing health services at HSC, whereby institutional delivery services could be assured at HSCs. The first batch of Rural Health Practitioners (RHPs) was posted at the HSC especially in the high focus districts in 2009 – 10. Subsequently more batches have been trained, recruited and posted in the rural remote in a phased manner.

This is the first study to understand the RHP model in Assam in terms of the background, roll out, implementation, and outcome of the model. This study highlights that, the contribution of the model of introduction of a mid – level cadre of health

personnel in strengthening Primary Health Care would be important for informing policy reforms or in formulation of policy responsive to the needs of the rural population. The study was conducted from February 2013 to June 2013

**Objectives:** to assess the primary health service in terms of ranges, quantity and quality since deployment of RHPs at SCs, understand the perspectives of RHPs regarding their course, their roles, ranges and types of services delivered in the past three years since their joining at health centers.

## METHOD

The study used mixed research method which is a combination of quantitative and qualitative research technique. Triangulation method was used for compilation and analysis of primary and secondary data obtained from sources (state, district reports, records, government orders, In-depth interviews). Purposive random sampling method is used for selection of 8 high focus districts (HFDs) out of 14 HFDs on the basis of criteria like availability of RHPs in health centers of district in the last 1 year period. The study team visited 94 SCs which was the sample unit, and where RHPs were employed in the selected districts. From a total of 140 RHPs positioned at sub centers in these districts, a sample size of 93 RHPs was chosen, out of which 2 dropped out due to constraints. All ANMs and MPW (M) present in the sub centers of the 91 selected SCs were included in the study. Altogether a total of 389 respondents considered as study sample comprising of RHPs, ANMs, MPWs were interviewed including 20 district and 4 state level officials, who were part of study sample. In addition to this, 20 group discussions with respective community served by sub centers, faculty and students from Jorhat Medical Institute were held.

They were administered semi structured questionnaires after obtaining signed consent from them. The questions were designed to understand their recruitment and retention processes, understanding of their job responsibilities and challenges faced. District wise performance reports on maternal and child

health indicators as well as data on infrastructure and equipments for 3 years were analyzed to assess the quantitative outputs of this mid – level health personnel. For the 8 high focus districts chosen for the study, the key maternal and child health performance parameters, indicators before and during the process of the phased deployment of the RHPs at the sub – centre and the effect of their services on Primary Health Care Delivery were reviewed by the investigators.

## RESULTS

**Total Number of Respondents:** Altogether a total of 389 respondents were interviewed i.e. 91 RHPs, 108 ANMs & 166 patients from Sub Centers, 20 district officials and 4 state level officials. 4 key state officials were interviewed including the Mission Director of NRHM, Assam to gain insights and their perspectives about the RHP scheme, level of implementation, challenges and way forward. In addition to this, 20 group discussions with respective community served by sub centers were held. Faculty and students from Jorhat Medical Institute were also interviewed.

### **Roll Out of RHP Course:**

The Assam Rural Health Regulatory Act was passed in 2004 to establish an authority for regulation and registration of Diploma Holders in Medicine and Rural Health Care (DMRHC) and their practice of medicine in rural areas<sup>15</sup>. Jorhat Rural Medical Institute started the first batch of DMRHC in September 2005, and 98 students underwent the training. Candidates having rural background with 10+2 (Physics/Chemistry/Biology); 50% pass mark for general candidates and 45% for reserved category are eligible for application. There is strong evidence from various countries that 'rural origin' (or rural background) is associated with rural practice<sup>16-18</sup>. Subjects are taught in 1<sup>st</sup> year, 2<sup>nd</sup> year and 3<sup>rd</sup> years, pre-clinical, para-clinical and clinical subjects respectively, after which they undergo internship of six months.

### **Deployment of RHPs:**

After the first batch passed out in September 2008, the Government of

Assam, in April 2010 deployed 86 RHPs in SCs of high focus districts (HFDs) to provide comprehensive health care services. These RHPs provide all the essential services (preventive, promotive, curative and emergency care) as envisaged in IPHS, in addition to National Health Program. As of March 2013; RHPs have been deployed in 370 out of 5610 SCs, across all 27 districts<sup>19</sup>.

### **Service Delivery by RHPs:**

All RHPs exclusively provided OPD services on working days in a week (Monday to Saturday) with an average daily OPD caseload of 25-30. Nearly 40% of them had provided ANC services on all days of the week while 39.6% to 41.8% of them had conducted institutional deliveries.

### **RHP recruitment and retention:**

Out of the respondents interviewed for the study, 70% were males and 20% females. 56% of them had pursued the RHP course as they wanted to serve the community while 24% felt it was a good job opportunity. 99% respondents felt that the course was helpful in developing the requisite skills for the job, yet only 62% were satisfied with the course duration, which they felt was rather short to develop requisite skills. Most felt that the period of internship should be longer. This is the first posting for 53% respondents and 45% of them got their first posting at their respective home town. 99% respondents get a monthly take home salary of more than INR 10000. Only one respondent has been provided accommodation in the rural remote. Most respondents (95.60%) felt that there are avenues for promotion in this job, but there was no further clarity on this.

97% respondents who were RHPs felt that they required further trainings to hone their skills, while only 18.6% have received any kind of training. 42% respondents refrained from answering this question. 92.68% felt that supervisory visits by senior officers of the district and block were useful and gave greater insights into their area of work. 89.66% RHPs attended review meetings and 72.73% felt that these reviews addressed the performance and related issues of the sub

centre. Health facility infrastructure, location of the health facility and referral for transport mechanisms were noted as major challenges. Nearly 94.51% respondents felt that the existing infrastructure was a challenge while 92.31% respondents felt the challenge was referral for transport. Although location was a challenge for 51.65% respondents, they also felt that this required the most urgent improvement followed by that for Health facility infrastructure.

### **Perspectives of RHP about the DMRHC Curriculum:**

Print media was the major source of information about the course. Interest for serving community and good job perspectives remained the main reason for pursuing the course among RHPs. Many of them had an opinion that DMRHC was similar to MBBS course in terms of subjects and contents taught; notable differences was the lack of Forensic Medicine, Major Surgery, Dermatology & Psychiatry and relatively shorter duration of course. Few wanted extension of course duration and internship period. However, majority of respondents considered that course was suitable and sufficient for serving in rural health settings. Most felt that internship program was very helpful in delivering their routine duties.

On questions about the course, a 27-year-old RHP responded:

*“The course curriculum is similar to MBBS except major Surgery skill and Forensic Medicine. The 3-year course is compact and subjects taught are adequate, but the volume of the whole course is quite large. Internship duration of 6 months - 5 month at Jorhat Medical College and 1 month at State dispensary - may be increased”*

Helpfulness of RHP course in conducting their daily duties:

Some of the RHPs commented on the deficiencies in the course, which they observed after having worked at sub centers. A 32 year old male RHP who joined in 2011 said:

*“Well and good for mostly Medicine related diseases. But not in surgical cases; also not*

*helpful in detecting and treating any dermatological diseases”*

### **Internship:**

The individual's feedbacks on internship and its duration were sought and responses were put as verbatim. Some of the responses from RHPs are as follows:

*“Overall the internship was good and helpful, but we needed higher study. Presently, the study prospect is very limited”.*

One RHP who joined the services in April, 2010 said:

*“The internship period of 6 months was not sufficient to fully equip us to conduct our routine work at sub centers; it should be a minimum of 1 year period with more emphasis on medicine, obstetrics and surgery”*

Merit based recruitment was adopted though campus recruitment was also conducted. Most of the RHPs responded that current posting was located outside their home-district and State Government has not provided any residential facility or quarter. There were no promotion avenues for the post. Main treatment provided was symptomatic management of minor ailments (common cold, fever, diarrhea etc.) and also NCD (diabetes, hypertension etc.)

### **Location of posting:**

Most of the RHPs responded that current posting was located outside their home-district and no residential facility or quarter was provided.

When asked for comments on their posting place, a 26 year old male RHP posted at one of sub-center in Hailakandi district said:

*“The local people are illiterate and aggressive; this place is so far away from my home and home district. There is no residential facility at the sub center for me.”*

Main challenges faced by RHPs were location of SC, lack of accommodation and referral transport facilities, which requires attention and remedial measures.

*The district and this sub-center are very far from my home district, here the locals do not understand Assamese, and so I face a lot of problem in communication. Also they are very reluctant to rent their house to outsiders like us”*

However, the RHPs from Jorhat district had a different story to tell as far as location of their postings was concerned. He said:

*“I sometimes feel very much insecure due to the interior location of this center, which is at the border area of Nagaland.”*

### **Services provided by the RHPs:**

Main treatment provided was symptomatic management of minor ailments (common cold, fever, diarrhea etc.) and also Non-Communicable Diseases (NCD) like Diabetes, Hypertension etc and few provided treatment for communicable diseases.

**Out Patient and Outreach services:** 94.51% respondents (RHPs) said that they treat non – communicable diseases including hypertension and diabetes, while only 39.56% treat communicable diseases including TB and Malaria. 96.7% respondents have treated emergency cases and 98.89% have conducted minor surgical interventions. 59.34% respondents have participated in outreach services while 62.22% have participated in VHNDs.

**Reproductive and Child Health Services:** The Maternal services were divided into

Ante – natal services, delivery services and postnatal services. For the child indicators, immunization and also questions on family planning were included.

**Ante natal services:** 97.73% respondents conduct physical examinations of pregnant women, 82.76% conduct routine laboratory tests such as haemoglobin tests, urine albumin among others. 45.5% said that they gave the complete package of services, while 21.84% refrained from answering the question.

**Delivery services:** 65.52% respondents do not use partography while 94.51% conduct deliveries at the sub centre. 94.38% are confident of identifying and referring emergency cases arising before or during labour.

**Post natal services:** 91.21% conduct post natal check-ups of the mother.

**Immunization and family planning services:** 69.23% respondents said that they immunize the new born child while a 100% said that they provide family planning services at the sub centre.

### **PERFORMANCE ANALYSIS**

We note that there has been a steady increase in the deployment of RHPs since 2009. As of the year 2012 - 13, RHP's presence at the sub-centres range from 4% to 13% of sub-centres in all districts included in the study. (Table1).

**Table 1: Distribution of sub-centers and availability of RHPs at SC across districts**

| District   | Year 2009-10 |        | Year 2010-11 |        | Year 2011-12 |        | Year 2012-13 |        |
|------------|--------------|--------|--------------|--------|--------------|--------|--------------|--------|
|            | Total SC     | RHP SC |
| Cachar     | 269          | 2      | 269          | 6      | 270          | 11     | 270          | 11     |
| Darrang    | 163          | 0      | 163          | 4      | 170          | 8      | 170          | 9      |
| Goalpara   | 151          | 0      | 151          | 6      | 151          | 16     | 151          | 19     |
| Hailakandi | 105          | 6      | 105          | 16     | 105          | 13     | 105          | 7      |
| Jorhat     | 143          | 1      | 143          | 3      | 144          | 9      | 144          | 12     |
| Karimganj  | 217          | 6      | 217          | 17     | 221          | 18     | 221          | 22     |
| Nagaon     | 349          | 0      | 349          | 4      | 357          | 8      | 357          | 23     |
| Nalbari    | 121          | 0      | 121          | 4      | 121          | 11     | 121          | 10     |
| Total      | 1518         | 15     | 1518         | 60     | 1539         | 94     | 1539         | 113    |

Source: Assam state HRMIS data for deployment of RHP –district wise <sup>19</sup>

There has been a gradual and steady increase in sub – centre performance in all

the districts. This includes of performance for pregnant women registered for ANC, no.

of OPD cases reported and no. of deliveries conducted at the sub – centres. (Table 2)

**Table 2: Sub – Centre Performance (SC)**

| Districts  | SC Performance                    |         |         |                           |         |         |                         |         |         |
|------------|-----------------------------------|---------|---------|---------------------------|---------|---------|-------------------------|---------|---------|
|            | Pregnant women registered for ANC |         |         | No. of OPD cases reported |         |         | No. of deliveries at SC |         |         |
|            | 2010-11                           | 2011-12 | 2012-13 | 2010-11                   | 2011-12 | 2012-13 | 2010-11                 | 2011-12 | 2012-13 |
| Nagaon     |                                   |         |         |                           |         |         |                         |         |         |
| Jorhat     | NA                                | 13705   | 14096   | NA                        | 81513   | 84301   | NA                      | 156     | 50      |
| Hailakandi |                                   | 17770   | 17958   |                           | 80506   | 79073   |                         | 82      | 40      |
| Goalpara   | 18312                             | 20000   | 19241   | 65180                     | 81680   | 84871   | 54                      | 696     | 1070    |
| Nalbari    | 6630                              | 9266    | 9777    | 50517                     | 66333   | 75401   | 13                      | 66      | 239     |
| Cachar     | NA                                | 37653   | 38556   | NA                        | 114525  | 99011   | NA                      | 233     | 377     |
| Darrang    |                                   | 19706   | 19757   |                           | 128095  | 113331  |                         | 82      | 490     |
| Karimganj  |                                   | 30803   | 31399   |                           | 100941  | 106062  |                         | 181     | 381     |

Source: District wise report on SC performance; HRMIS

During the period between 2007 – 08 and 2012 – 13, the overall State performance related to maternal health services improved with indicators such as ANC registrations of pregnant women increasing from 73.30% to 100%, institutional deliveries against estimated deliveries increasing from 35.30% to 67.20% and home deliveries also increasing from 7.50% to 13.90%. In the 8 high focus

districts the key indicators such as ANC registration and Mothers who had at least 3 Ante-Natal care visits during the last pregnancy, nearly doubled. This increasing trend was also noted with regard to child services also. Children aged 12-23 months Fully Immunized against expected live births (%) increased from 50% in 2007 – 08 to 84% in 2012 – 13. (Table 3).

**Table 3: Key health indicators of Assam during the year 2007 – 13**

| Year  | Before RHP induction |         | After RHP induction |         |         |
|---|----------------------|---------|---------------------|---------|---------|
|   | 2007-08              | 2008-09 | 2010-11             | 2011-12 | 2012-13 |
|   | (DLHS-3)             | (CES)   | (HMIS)*             | (HMIS)* | (HMIS)* |
| Mothers who received any ante-natal check (%)                               | 74.8%                | 93%     | 95%                 | 100%    | 100%    |
| Institutional Deliveries against Estimated Deliveries                       | 35.30%               | 64.4%   | 57%                 | 64%     | 67%     |
| Home Deliveries (SBA& Non SBA) against Estimated Deliveries\$               | 63.6%                |         | 16%                 | 16%     | 14%     |
| Children aged 12-23 months Fully Immunized against expected live births (%) | 50.9%                |         | 80%                 | 82%     | 83%     |

Source: DLHS-3 <sup>20</sup>; CES, North -East <sup>21</sup>; HMIS <sup>22</sup> \*(children 0-11 months fully immunized)

Similar improvement in key indicators such as Crude Birth Rate, Maternal Mortality

Ratio, Infant Mortality Rate and Neo – Natal mortality ratio. (Table 4)

**Table 4: Key health indicators in 8 High focus districts of Assam before and after posting of RHP**

| Name of High Focus District | Crude Birth Rate |             | Maternal Mortality Ratio |           | Infant Mortality Rate |           | Neo-natal Mortality Rate |           |
|-----------------------------|------------------|-------------|--------------------------|-----------|-----------------------|-----------|--------------------------|-----------|
|                             | Before RHP#      | After RHP\$ | Before RHP               | After RHP | Before RHP            | After RHP | Before RHP               | After RHP |
| Nagaon                      | 26               | 25.2        | 367                      | 314       | 69                    | 67        | 42                       | 40        |
| Jorhat                      | 20.8             | 20          | 430                      | 436       | 60                    | 57        | 45                       | 42        |
| Hailakandi                  | 34.2             | 33.3        | 342                      | 288       | 56                    | 56        | 37                       | 35        |
| Goalpara                    | 22.9             | 22.3        | 366                      | 325       | 58                    | 58        | 40                       | 40        |
| Nalbari                     | 18.9             | 18.8        | 366                      | 325       | 65                    | 60        | 49                       | 44        |

|           |      |      |     |     |    |    |    |    |
|-----------|------|------|-----|-----|----|----|----|----|
| Cachar    | 27.4 | 26.6 | 342 | 288 | 60 | 56 | 40 | 35 |
| Darrang   | 21.2 | 20.9 | 366 | 325 | 71 | 74 | 39 | 41 |
| Karimganj | 26.4 | 26   | 342 | 288 | 71 | 70 | 47 | 46 |

Source: AHS 2010-11; 2011-12<sup>23</sup>; #Before RHP (AHS, 2010-11); \$After RHP (AHS, 2011-12)

### **Community's perspectives:**

20 group discussions with respective community served by sub-centers were held, one in each village visited to understand the perspectives and views of community comprising of pregnant women, women having child of five years and less, elderly people, village panchayat committee members etc.

After posting of RHPs at SCs; provision of ANC and PNC services have become more systematic and are available daily. SCs have now the capacity to conduct institutional deliveries and besides common ailments, RHPs manage accidental & emergency cases like burns etc. The medicines' availability status has improved considerably and RHPs have managed to gain people's confidence. Infant and maternal related illnesses and deaths have decreased since the RHPs could identify danger signs for proper referral. The RHPs are also able to screen patients before making referrals to district hospitals, thereby reducing the caseloads of hospital doctors.

### **Perspectives of Faculties/Students:**

Faculty and students commented that current Diploma course should be upgraded to a Bachelor degree course to facilitate interested students in their pursuit for a Master's degree. Increasing the internship period from 6 months to 1 year was suggested. The lack of adequate faculty, especially the senior teacher positions, has hampered the teaching program. Creation of regular cadre will help to chart out career progression, would help in sustainability of the model.

### **Perspectives of Government Officials:**

Overall it is a good model as people's perceptions towards service delivery in sub centers has changed dramatically. People's perception about ranges and quality of services has changed after deployment of RHPs with SCs showing remarkable

increase in OPD cases load and initiation of institutional deliveries. Many officials felt RHP model could be scaled up provided they receive adequate trainings and are well equipped to deliver quality health care services. Few felt that due recognition of DMRHC by MCI would tremendously boost the RHP's morale and help in scaling up the model.

### **CONCLUSION**

The concept of Rural Health Practitioners is not new but predates independence of India, when Licentiate Medical Practitioners (LMP) served rural areas. During the post-independence era, medical doctors with five and half years of training were introduced with abolition of the LMP<sup>24</sup>. This led to acute shortage of qualified clinical care providers in rural India partly due to limitation in concurrent expansion of medical education and also due to unwillingness of Medical Doctors to serve in the remote rural areas. The RMAs introduced in Chhattisgarh and RHPs in Assam are classified as mid-level health workers under 'non-physician clinician (NPC)' who is not trained as physician but who is able to perform many of the diagnostic and clinical functions of a medical doctor and who has more clinical skills than a nurse though the requisites and training varies from country to country but often include 3 or 4 years of education after secondary school in clinical medicine, surgery and community health<sup>10, 25, 26</sup>. The process of designing the RHP model in Assam shared similarities with those of clinical associate programme (CAP) introduced in South Africa for serving rural communities in terms of accommodating the contextual factors like establishing a regulatory body, training within rural based training institute of specific duration, tailored scope of practice and rural based selection<sup>27</sup>.

Our study shows that there has been remarkable increase in OPD services as well as in delivery services, since the introduction of RHPs at the sub-centres. It

is also noted that a majority of them had conducted institutional deliveries at health facilities. Sub-centers with RHPs have also started providing a wide range of OPD services such as the symptomatic treatment of minor ailments, diagnosis, referral and treatment of communicable diseases, screening and treatment for non-communicable diseases, management of emergency cases, and minor surgical procedures among others. ANC services such as General Physical Examinations, distribution of iron tablets, TT injections, urine and hemoglobin test have also been taking place. Institutional deliveries, immunization service and outreach services such as VHND, home visits for Post Natal Care, Family Planning counseling and provision of condoms and contraceptives have also remarkably increased. Accessibility to preventive, promotive and curative services at the Primary Health Care level has improved in all districts. Our findings resonates with previous evidence that, "with appropriate and adequate training....and provided with continued support, and supervision, [mid-level workers] can indeed provide care comparable to medical professionals <sup>28</sup>.

Deployment of RHPs has indirectly resulted in a gradual decline in the overall mortality rates in most of the High Focus districts, where the RHPs have been deployed (though various attributes related to health systems strengthening play complimentary role) except in the districts of Darrang and Goalpara where the mortality rates have either remained constant or slightly increased. Indeed, we also note the challenges that prevail with the introduction of this mid – level cadre. These include revising the course content and the duration of internship, which most RHPs expressed concerned that internship period are too short to provide them with the requisite skills. The course curriculum should endeavor to address the needs of Primary Health Care, while imparting the necessary skills for early detection and referral of complications to higher centres. There is also need for sessions of continuous medical education and robust short term trainings to constantly upgrade their knowledge as well as skills. Other significant challenges of RHPs similar to previous study in South Africa includes

scaling up production, creating more funded public sector posts to absorb new graduates, managing career aspirations of the new cadre as they gain experiences etc <sup>27</sup>. In order to make this model sustainable there needs to be a regularized cadre of Community Health Officers with a clearly demarcated and well defined career progression within the Health system. Regular transfers and posting policy, opportunities for further studies in the field of Public Health as well as grievance redressal mechanisms also need to be clearly defined at the State level, in order to retain this cadre of skilled human resources.

The introduction of the RHP in rural and remote HSC of Assam has helped transform the health facility into a fully operational unit, delivering preventive, promotive as well as curative services. Keeping in view the contribution of the RHPs to remote and rural areas in Assam, and the financial and the social gains achieved through this model, there is potential for scaling up this model for good quality and sustained Primary Health Care Delivery by the Health Services. Improvement in human resources through augmentation has led to improved health services delivery in the state if we are to reduce the maternal mortality rate in longer term <sup>29</sup>. The initial successes of these initiatives has also lead the Government of India to contemplate on a three year Bachelor course for introduction of similar mid – level cadre for achieving Universal Health Coverage in the country. Like RHPs, other non-physicians clinicians (NPCs) with three years of training, nurse-practitioners, RMAs in Chhattisgarh possess a standard level of clinical competence, and their patients are satisfied with and trust the care they receive <sup>30</sup>. Assessing the impact of the new cadre on quality of care will become a new priority and key area of future research, given the general concerns about quality of management and supervisory system.

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**Conflict of Interest & Funding:** There are

no conflicts of interest.

## ETHICS AND CONSENT

The Ethical Committee of National Health Systems Resource Center (NHSRC) approved the methods and materials including questionnaires and checklists used in this study. Informed consent was taken from each respondent after explanation about study purpose, study outputs and use of findings for potential policy changes or for research publications.

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