

Economic analysis of ASHA-soft programme (online payment and monitoring system) in Jodhpur, Rajasthan

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ABSTRACT

Context: The Government of India under a performance-based payment scheme is providing remuneration as per the activities completed by the Accredited Social Health Activists (ASHA) health workers. Each state in India has a different performance-based payment system for ASHAs. The state of Rajasthan developed the ASHA-Soft system in 2014 for providing incentives to ASHAs. **Aims:** This study is planned to analyze the performance of ASHA-Soft considering the economic aspects as there is a paucity of studies in this context. **Settings and Design:** This study was conducted in Jodhpur, Rajasthan. **Methods and Material:** Economic analysis of ASHA-Soft program was performed based on Incentive paid to ASHA workers; Number of beneficiaries; Overall contribution of ASHAs in the health services; and unit cost per health service under ASHA-Soft program. Data of five financial years, that is, from the inception of ASHA-Soft was analyzed. **Results:** Consolidated incentive for maternal health, child health, and Immunization services provided to ASHAs through ASHA-Soft in the year 2015--16 was \$96794.22, \$35348.32, and \$49016.83 which increased to \$200285.00, \$116320.52, and \$101686.48 in the year 2019--20, respectively. Family planning and national program services were provided to 6,259 and 4,061 beneficiaries, respectively, in the year 2015--16 which markedly increased to 16,360 and 9,552 in the year 2019--20. Unit-cost of service provided by ASHAs in the National Programme (\$1.13) was the lowest and for Family Planning Services (\$5.71) were the highest. **Conclusions:** ASHA-Soft program seems a potential program to attract ASHA workers for delivering health care services. The findings of this study could assist policymakers in guiding further decision-making.

Keywords: Benefits and costs, community health workers, decision-making, health services, pay for performance, policy analysis

Introduction

India, like other developing countries, has introduced incentive-based payments for health workers which are linked

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to results for improving accessibility, quality, and performance of health care services and systems.^[1,2] For providing improved access to health care at the community level and to motivate volunteer community health worker- Accredited Social Health Activists (ASHAs) for achieving defined health objectives, Government of India (GoI) has introduced a performance-based payment (PBP).^[3] Under this scheme, the remuneration amount is provided as per the activities completed by the ASHAs.^[3] Each

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state in India has different PBP system for ASHAs. Primary healthcare providers, that is, ASHAs are community health workers appointed under National Rural Health Mission (NRHM) with the sole purpose of working in close contact with the community as a primary care provider. ASHA is a grass-root-level community health worker which functions as a primary health care facilitator and service provider.^[4] State of Rajasthan has developed ASHA-Soft system for providing PBP to ASHAs.^[5] This Online Payment and Monitoring System was launched on 25th December, 2014^[6] to facilitate the user to capture beneficiary wise details of services given by ASHA to the community, providing online payment of ASHA in their bank accounts, generate various reports to monitor the progress of the programme, and to ensure their timely and seamless online payment.^[5,6]

PBP programs are designed, constructed, and operated mostly considering economic principal-agent theory, intended to make system efficient.^[7,8] This theory assumes that for increasing quality or efficiency “effort” on the part of the agent is required, who must be compensated with a financial reward if improvements are to be secured and principal balance the expected costs of the rewards against the expected improvements in efficiency.^[7,8] Most of the PBP are implemented based on the assumption that healthcare providers exert more effort when payments are conditioned to the quantity and quality of the health services provided.^[9] There is paucity of studies which actually assess the performance of these PBP and ASHA-Soft is not an exception to this. Since the launch of ASHA-Soft, very few studies have been conducted which analyze the performance of ASHA-Soft especially from economic point of view. Guidance provided by economic analysis can help decision makers to take further implementation decisions. Therefore, this study is planned to analyze the performance of ASHA-Soft considering the economic aspects.

Subjects and Methods

To study the performance of ASHA-Soft programme in Jodhpur district, Rajasthan. We performed economic analysis of ASHA-Soft programme based on following key points: Incentive paid to ASHA workers; Number of beneficiaries; Overall contribution of ASHA workers in the health services; and Unit cost per health service under ASHA-Soft programme. Data of five financial years, that is, from the inception of ASHA-Soft (2015--16) till 2019--20 was taken into account for the analysis. Though ASHA-Soft was implemented in the last week of December 2014, but for the study purpose we considered full financial years. Data was obtained from ASHA-Soft portal and review of activities performed under various category of services, that is, maternal health, child health, Immunization, family planning, national programmes, and monthly meetings was carried out.^[10] All costs were converted to US dollars at an exchange price of INR 74.86 per single US dollar. (Approval was taken by Institutional ethical committee of All India Institute of Medical Sciences, Jodhpur on 17/09/2018 Ref No. AIIMS/IEC/2018/1398).

Results

ASHA workers are provided incentives through ASHA-Soft for different activities performed under six categories of health services. These categories are maternal health, child health, immunization, family planning, monthly meetings, and national programmes.

Maternal health services

One of the major responsibilities of ASHA workers is to improve maternal health services by motivating mothers for 4 ANC check-ups and promoting institutional delivery for improving health outcomes. Through ASHA-Soft, ASHA workers are provided incentives for ensuring 4 ANC check-ups, institutional delivery, linkage of beneficiary bank account for receiving scheme benefits and reporting of maternal deaths in their assigned geographical work area.

Data of Jodhpur district revealed that consolidated incentive for maternal health services provided to ASHA workers in the year 2015--16 was \$96794.22 which increased to \$200285.00 in the years 2019--20 after 5 years of implementation of ASHA-Soft programme. For 4 ANC check-ups and institutional delivery incentives increased from \$59186.48, \$37484.64 (2015--16) to \$72237.51, \$127033.13 (2019--20), respectively. [Figure 1] illustrates the incentive provided to ASHA workers under the maternal health services through the ASHA-Soft programme for the duration of five financial years.

It was found that maternal health services was provided to 26,245 beneficiaries in the year 2015—16 which markedly increased to 74,316 beneficiaries in the year 2019--20. [Figure 2] shows the details of beneficiaries under maternal health services for five financial years. There was increase in number of beneficiaries for 4 ANC services and institutional delivery from 15,059, 9,538 (2015--16) to 24,835, 34,301 (2019--20), respectively.

Child health services

Child health services is another important key component ASHA programme.

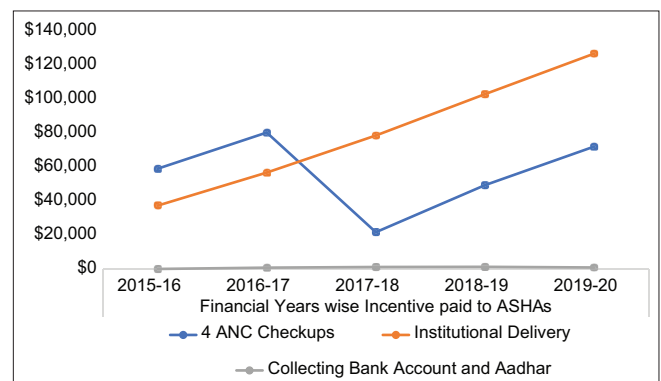


Figure 1: Total incentives paid to ASHA workers under maternal health services through ASHA-Soft programme

Under ASHA-Soft, ASHA workers are paid for providing various child health services such as HBNC (Home Based New-born Care), HBNC+, child death reporting, admission of SAM (Severe Acute Malnutrition) child, follow-ups SAM child, SNCU (Special New-born Care Units) follow-ups, MAA (Mother's Absolute Affection) programme, IDCF (Intensified Diarrhoea Control Fortnight) programme, NIPI (National Iron Plus Initiative) programme, and NDD (National Deworming Day) programme.

Data analysis revealed that incentive provided to ASHA workers for child health services has been continuously increasing since the inception of ASHA-Soft. For the year 2015--16, incentive paid for consolidated child health services was \$35,348.32 which increased to \$116,320.52 in the year 2019--20. [Figure 3] shows the incentive paid to ASHA workers for important child health services.

It was found that ASHA workers provided child health services to 10,661 beneficiaries in the year 2015--16 which markedly increased to 42,706 beneficiaries in the year 2019--20. [Figure 4] shows the details of beneficiaries under child health services for five financial years. There was increase in number of beneficiaries for HBNC, SNCU follow-ups, and MAA programme from 10,658, 3 and 0 (2015--16) to 29,934, 29 and 6,415 (2019--20), respectively.

Immunization services

ASHA workers support India's Universal Immunization Programme through mobilizing beneficiaries and for providing

this service they are paid incentives through ASHA-Soft programme. ASHA workers work for getting all pregnant women and children under five years of age immunized with vaccine doses as per the immunization schedule, in a timely manner.

Under immunization services, incentives are provided to ASHA workers for social mobilization, immunization, complete immunization, and booster doses. Consolidated incentives for immunization for the year 2015--16 was \$49,016.83 which increased to \$101,686.48 in 2019-20. [Figure 5] shows incentives provided to ASHA workers for major immunization services through ASHA-Soft for the duration of five financial years.

It was found that immunization services were provided to 32,617 beneficiaries in the year 2015--16 which markedly increased to 87,358 beneficiaries in the year 2019--20. [Figure 6] shows the details of beneficiaries immunization services for five financial years. There was increase in number of beneficiaries for social mobilization, immunization, and complete immunization from 14,404, 11,867, and 6,346 (2015--16) to 21,994, 42,752, and 22,612 (2019--20), respectively.

Family planning services

ASHA workers have significant role in implementing national family planning programme in their community. They are vital

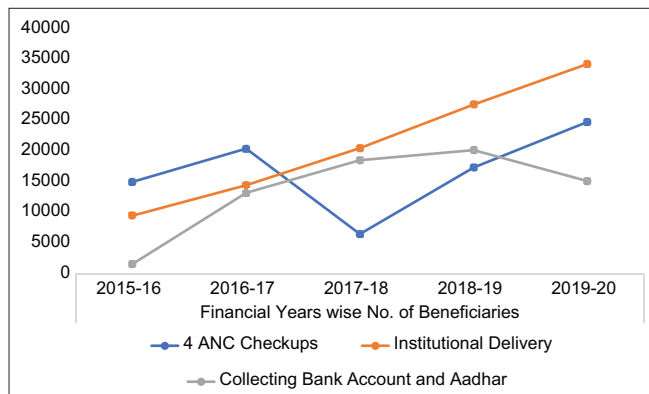


Figure 2: Details of beneficiaries under maternal health services for five financial years

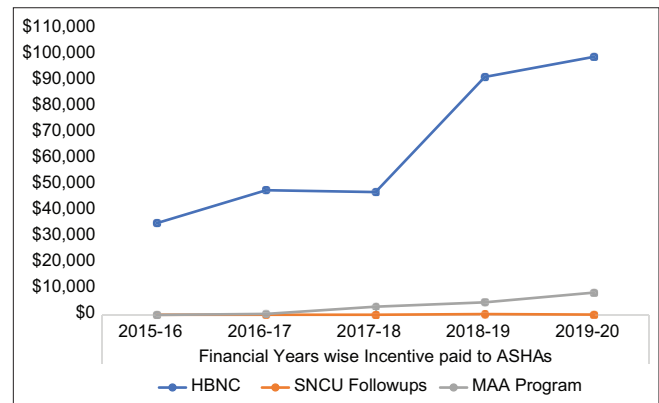


Figure 3: Incentive paid to ASHA workers for important child health services

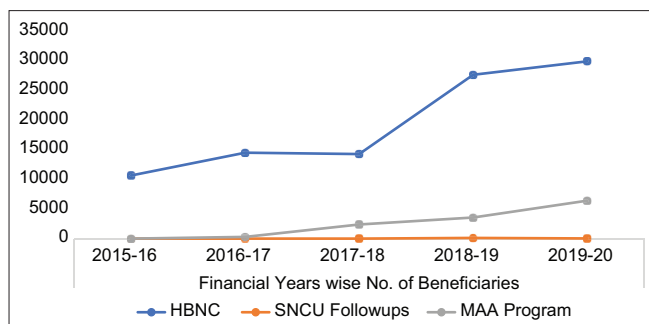


Figure 4: Details of beneficiaries under child health services for five financial years

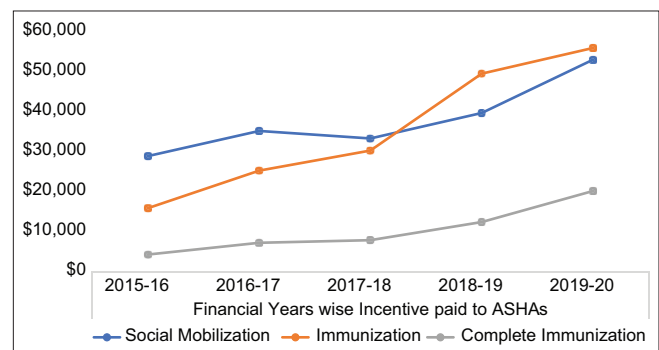


Figure 5: Incentives provided to ASHA workers for major immunization services through ASHA-Soft for the duration of five financial years

agents for inspiring the community to follow small family models by accepting various family planning methods.

Under family planning services incentives provided to ASHA workers for various services namely sterilisation female and male, sterilisation on 1 or 2 children, ensuring 2 years delay of child births after marriage, for 3 years difference between age of two child, PPIUCD (Postpartum Intrauterine Contraceptive Devices), post abortion IUCD, and Antra injectable contraceptive.

This study revealed that consolidated incentive for family planning services provided to ASHA workers in the year 2015–16 was \$40,448.84 which increased to \$86,795.35 (2019--20) after 5 years of implementation of ASHA-Soft programme. For sterilisation and PPIUCD, incentives increased from \$6,350.52 and \$488.91 (2015--16) to \$10,581.08 and \$8,928.67 (2019--20), respectively. [Figure 7] illustrate the incentive provided to ASHA workers under the family planning services through the ASHA-Soft programme for the duration of five financial years.

It was found that family planning services was provided to 6,259 beneficiaries in the year 2015--16 which markedly increased to 16,360 beneficiaries in the year 2019--20. [Figure 8] shows the details of beneficiaries family planning services for five

financial years. There was increase in number of beneficiaries for sterilisation and PPIUCD from 2,571 and 247 (2015--16) to 4,638 and 4,471 (2019--20), respectively.

National programmes

ASHA workers act as a link between the community and the public health system and would have a central role in achieving goals in national health programs and policies.

Under national programme incentives provided to ASHA workers for various services namely DOT's, cataract, leprosy, malaria, blood slides preparation, adolescent health and NPCDCS (National Programme) programme.

This study revealed that consolidated incentive for family planning services provided to ASHA workers in the year 2015--16 was \$3,451.78 which increased to \$12,958.52 (2019--20) after 5 years of implementation of ASHA-Soft programme. For DOT's and NPCDCS programme, incentives increased from \$2438.70 and \$0.00 (2015--16) to \$10,209.60 and \$966.25 (2019--20), respectively. [Figure 9] illustrates the incentive provided to ASHA workers under the national programme services through the ASHA-Soft programme for the duration of five financial years.

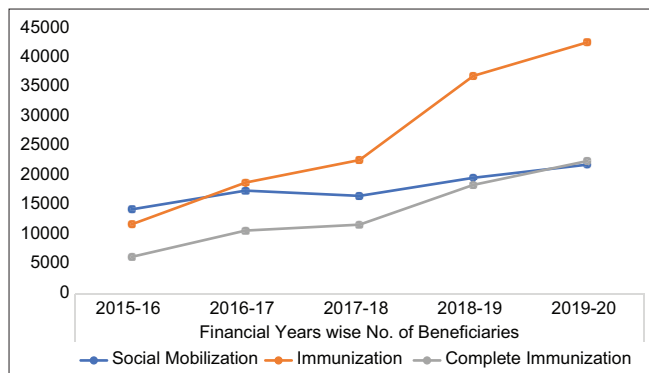


Figure 6: Details of beneficiaries immunization services for five financial years

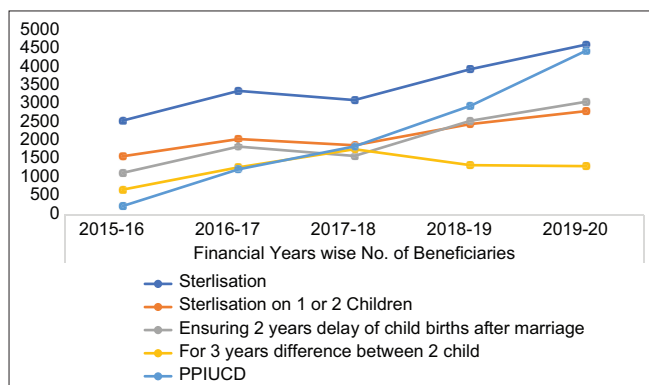


Figure 8: Details of beneficiaries family planning services for five financial years

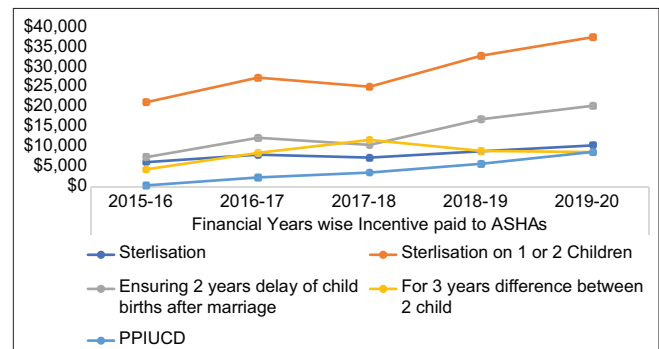


Figure 7: Incentive provided to ASHA workers under the family planning services through the ASHA-Soft programme for the duration of five financial years

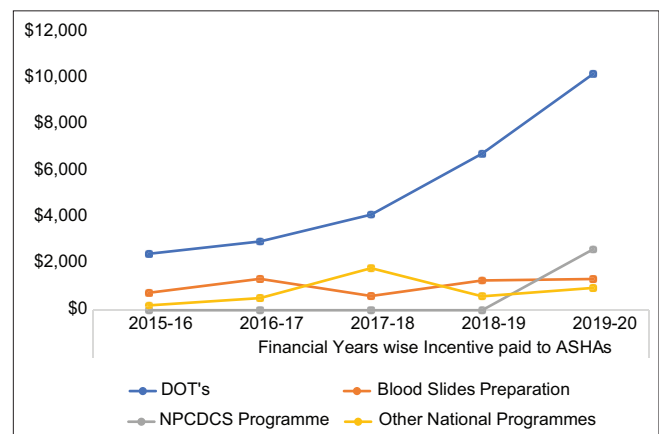


Figure 9: Incentive provided to ASHA workers under the national programme services through the ASHA-Soft programme for the duration of five financial years

It was found that national programme was provided to 4,061 beneficiaries in the year 2015--16 which markedly increased to 9,552 beneficiaries in the year 2019--20. [Figure 10] shows the details of beneficiaries national programme for five financial years. There was increase in number of beneficiaries for DOT's and blood slide preparation from 231 and 3,819 (2015--16) to 929 and 6,813 (2019--20), respectively.

Monthly meetings

ASHA facilitators have to organize a monthly meeting of all enrolled ASHA workers in his/her area. Aim to organize monthly meetings by ASHA facilitator is to conduct performance review and planning; discuss common issues and problems faced by ASHA during the month; highlight those actions which need to be discussed at monthly PHC review meeting; obtaining data from the ASHA to enable consolidation at the block level; and keep the ASHA worker's updated about guidelines and other technical details about programmes related to health and her work.

Under monthly meetings, incentives provided to ASHA workers for various activity namely routine monthly activities performed by ASHA workers (ASHA updated line list of households, ASHA dairy, due list of immunization, due list of ANC and list of eligible couple); monthly MAS meeting performed by ASHA; VHSNC meeting attend by ASHA; PMSBY and PMJJBY.

This study revealed that consolidated incentive for monthly meetings provided to ASHA workers in the year 2015--16 was \$74,262.62 which increased to \$532,745.6 (2019--20) after 5 years of implementation of ASHA-Soft programme. For routine monthly activities performed by ASHA workers, incentives increased from \$44,098.32 (2015--16) to \$431,816.7 (2019--20).

It was found that monthly meetings were provided to 6,901 beneficiaries in the year 2015--16 which markedly increased to 25,466 beneficiaries in the year 2019--20. There was increase in number of beneficiaries for updated line list of households, updated ASHA diary, updated due list of immunization, and updated due list of ANC from 1,317, 1,311, 1,329, and 1,327 (2015--16) to 2,072, 2,068, 2,074, and 2,073 (2019--20), respectively.

To provide trend of overall incentives paid to ASHA workers and beneficiaries of the ASHA-Soft programme for five financial years, line chart was developed as shown in [Figures 11 and 12].

Overall contribution of ASHA workers

Table 1 shows the overall contribution provided by ASHA workers in major health services through ASHA-Soft programme. For institutional delivery, full immunization and sterilisation services contribution of ASHA workers continuously increased for each financial years from the inception of ASHA-Soft programme. Overall data of major health services for Jodhpur district was

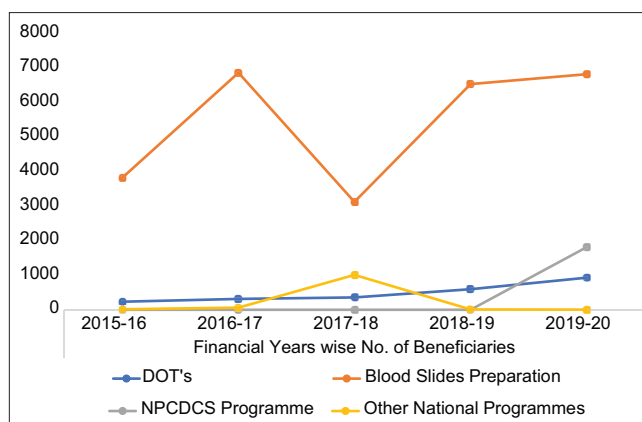


Figure 10: Details of beneficiaries national programme for five financial years

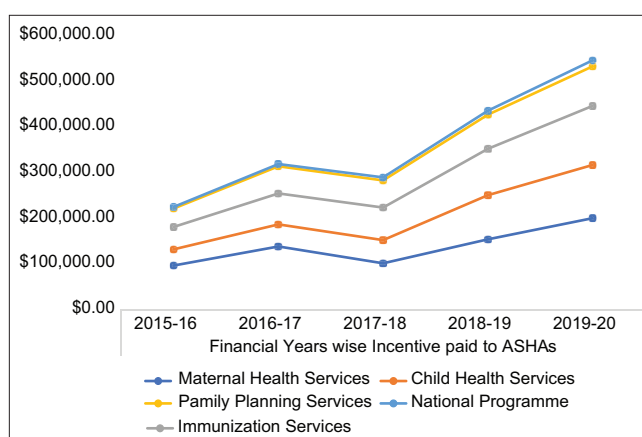


Figure 11: Trend of overall incentives paid to ASHA workers through ASHA-Soft programme for five financial years

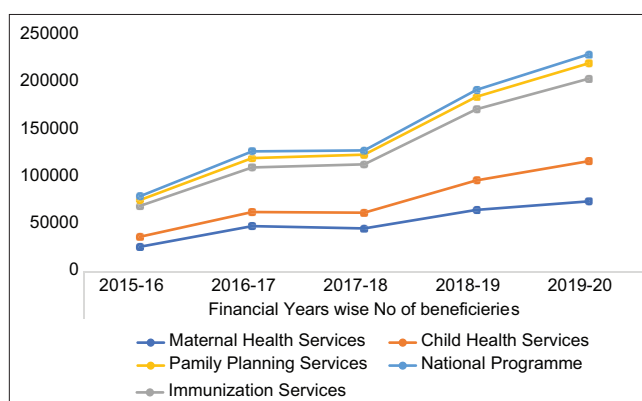


Figure 12: Trend of overall beneficiaries of the ASHA-Soft programme for five financial years

obtained from PCTS (Pregnancy, Child Tracking & Health Services Management System) platform.^[11]

Unit cost of providing health service under ASHA-soft programme

Unit cost of service for National Programme (\$1.13) and Immunization Services (\$1.43) were lowest and for Family

Table 1: Overall contribution of ASHA workers in the health services

Major health services under ASHA-Soft programme	Financial years wise contribution of ASHA workers (%)				
	2015-16	2016-17	2017-18	2018-19	2019-20
4 ANC Check-ups	14.47	18.07	7.00	17.87	21.25
Institutional Delivery	14.34	20.36	29.57	38.71	48.22
Full Immunization	16.69	26.25	31.20	51.93	60.48
Sterilisation (Male and Female)	20.16	26.46	25.66	32.52	37.21
PPIUCD	4.44	16.92	18.72	23.98	29.65

Table 2: Unit cost of providing health services under ASHA-Soft program

Major health services	Total Cost (INR) (2015-20)	Total Number of Beneficiaries (2015-20)	Unit Cost (INR)	Unit Cost (\$US)
Maternal Health Services	51737305	259782	199.16	2.66
Child Health Services	25984354	116186	223.64	2.99
Immunization Services	31379375	293935	106.76	1.43
Family Planning Services	23995150	56128	427.51	5.71
National Programme	2744870	32458	84.57	1.13

Planning Services (\$5.71) were highest. Table 2 shows the unit cost of providing health services under ASHA-Soft programme.

Discussion

It is difficult to perform full economic evaluations of e-Health programs involving PBP initiatives as these type of program are initiated as a part of larger health care improvement efforts which make the evaluation of the independent effect of the financial incentives difficult.^[9] ASHA-soft as most of the PBP does not function in isolation but they co-exist with other supporting interventions, which impact the performance simultaneously.^[9] There is a lack of literature which actually provides the framework for conducting proper economic evaluation for these types of programs and moreover there is mixed opinion regarding actual cost effectiveness of the PBP strategies.^[9,12] Therefore, we developed a four point criteria for conducting economic analysis as mentioned in method section based on literature searches and consultation exercise with experts. Overall, this study pointed out that in Jodhpur ASHA-Soft initiative essentially motivated ASHA workers for providing more health care. Similar findings were demonstrated in the recent studies conducted for assessing ASHA-Soft programme, which showed that satisfaction and motivational level of ASHA workers was increased after the launch of ASHA-Soft programme.^[5,6,13]

In this study, financial year 2015--16 was considered as base line, as this was the first financial years after inception of ASHA-Soft programme. Data across the five consecutive year including end line financial year 2019--20 were analyzed. When data was compared for base line and end line financial years, incentives and beneficiaries for almost all health services showed increasing trend. For maternal health, child health, immunization and family planning services incentives were increased to 52%, 70%, 52%, and 53%, respectively, from base line to end line financial years. Similarly, there was increase in beneficiaries under various services: maternal health (68%), child health (75%), immunization (63%),

and family planning (62%). This study also showed that after implementation of ASHA-Soft programme, ASHA workers were also motivated towards providing their services in national health programmes. Incentives and beneficiaries for DOT's programme showed marked increase of 76% and 75%, respectively. It was also evident that this programme brought ASHA workers into active state for participation in monthly review meetings and this helped in assessing the performance of ASHA workers and keeping record of work done by them. This was verified by analyzing the increase in percentage of ASHA workers (73%) attending monthly meetings and increase in incentive (86%) provided to them.

We also estimated the unit costs of delivering health services by ASHA workers as there only few studies conducted in India which provides unit cost of delivering primary health services.^[14-16] Unit cost can be used further economic evaluations for estimating cost effectiveness or cost utility of health workers.

Effectiveness of this programme was also illustrated in this study by analyzing overall contribution of ASHA workers through ASHA-Soft in delivering the various health services. For important services like institutional delivery and full immunization around 48% and 60% contribution was made by ASHA workers. This type of contribution of ASHA workers will definitely help in expediting the achievement of national health and population policy goals. Moreover, ASHA-Soft programme is contributing a vital role for implementing ASHA programme as it is helping in achieving the goal of increasing community engagement with the health system as anticipated by National Health Mission (NHM).^[4,17]

Conclusion

ASHA-Soft (Online Payment and Performance Monitoring System) programme seems as a potential program to attract ASHA workers for delivering health care services. Understanding the trends of incentive provided, effects and unit cost of the various health services provided under ASHA-Soft could assist policy-makers in guiding further decision making.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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