



Health Technology Assessment of TeCHO+ Programme in Gujarat



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Policy Brief

Summary

Gujarat has been implementing mHealth programme known as TeCHO+ (Technology for Community Health Operations). A TeCHO+ enabled mobile phone was provided to all Female Health Workers of the State in 2019. This brief addressed the cost-effectiveness of TeCHO+ as compared to E-Mamta in Gujarat.

The study participants were surveyed from 48 sub-centres across 24 Primary Health Centres from 6 Talukas of Gujarat's three selected districts. A total of 385 postpartum women and mothers of 230 children were assessed at baseline and 357 postpartum women and mothers of 157 children after one year of programme intervention in 2020.

Key Findings

The annualized cost incurred for the TeCHO+ programme was estimated to be INR 376,08,26,815. With this investment, the calculated cost per beneficiary amounted to (INR) 2424. The cost-effectiveness analysis indicated that TeCHO+ incurs an incremental cost of INR 1802.84 per DALY averted, which is below the GDP per capita of India.

Recommendations

Cost-effectiveness analysis clearly shows that TeCHO+ is cost-effective for Mother and Child Care. It incurs an incremental cost of INR 1802.84 per DALY averted, which is below the GDP per capita of India. Further, TeCHO+ programme has significantly improved health service delivery through increased accuracy of data management, high risk identification, quality and accessibility of care.

The study findings indicate that the TeCHO+ programme can be considered for replication.

Introduction

The Health & Family Welfare Department, Gujarat introduced TeCHO+ (Technology for Community Health Operations) since 2019, replacing e-mamta – the mother and child tracking system. TeCHO+ is a mobile & web-based application that essentially enables data entry by the person providing service at the time and place of service delivery to improve the coverage and data quality. The programme encompasses unique features such as real-time data entry, generates alerts for high-risk cases, tracks beneficiaries as well as health workers, a web-based dashboard that enables health officials at different levels to access progress reports, and extends supportive supervision to health workers. These unique features are expected to enhance Gujarat's performance in eleven priority areas.

Policy Implications and Novelty

- The study outcomes has pontial in contributing to the the increased access to quality antenatal care in pregnancy, as well as post-natal care.
- TeCHO+ programme attempt to overcome gaps in MCH data and link data with facility and services.
- No cost-effectiveness evidence available of the TeCHO+

Aim of the study

The study aims to compare cost-effectiveness of the TeCHO+ and eMamta in Gujarat, India

METHODS

The study compared key programme outcome indicators before and after the launch of TeCHO+ programme. Cost-effectiveness analysis was done using decision-analytic modelling with health system perspective.

Sample size

The study participants were surveyed from 48 sub-centres spread across the three selected districts of Gujarat. The selection of the district was done based on the category of HDI ranking of Gujarat and maturity of TeCHO+ programme. The selection of Taluka was done purposively based on their distance to their respective headquarters. However, a simple random sampling method was adopted to select the PHC and Sub-Centre using a table of random numbers.

A total of 385 postpartum women and mothers of 230 children were assessed at baseline and 357 postpartum women and mothers of 157 children after one year of programme intervention in 2020. For morbidity and its management related indicators, all the high-risk women suffering from severe maternal anaemia and pregnancy-induced hypertension (PIH) and children suffering from severe acute malnutrition and low birth weight reported at the selected PHCs was surveyed.

Cost data

Cost data was collected from a health systems perspective. An incremental costing approach was adapted for the study. Financial record of *TeCHO+* project involved in delivering intervention activities remained a key source of information.

In addition, a time usage study was conducted to assess the true cost incurred by the State and assess any time saved as a result of the TeCHO plus programme through interviewing key stakeholders and programme staffs at every level.

Cost of time spent by various technical partners of TeCHO+ programme towards capacity building, resource utilization was assessed through interviews and financial records. Cost of service delivery (cost of ANC care, immunization, cost of PHC & CHC level care, cost of institutional delivery, cost of specialist care (Gynaecologist and Paediatrician) were inferred from secondary literature. All costs are presented in local currencies. Costs were converted to constant values and reported as annualized cost in 2019- 2020 price.

Cost-effectiveness

Transition probabilities were derived from primary data for clinical indicators for both the intervention and control arms. Time horizon of the study was one year and 3% discounting was applied. One-way sensitivity analysis was carried out by varying model parameters to estimate uncertainty in all parameters. A tornado chart is presented using ICER values to depict changes in selected variables that influence the results.

Budget Impact Analysis was performed to estimate the cost of implementing TeCHO+ programme at the National levels at 2020 prices. The Budget Impact Analysis depicted the allocation of budget for 1st year to 5th year.

Findings

The annualized cost incurred for the TeCHO+ was estimated to be INR 291,99,69,103. With this investment, around 12,04,590 beneficiaries, the

calculated cost per beneficiary amounted to (INR) 2424. Similarly, for eMamta, the programme cost was estimated to be INR 334,01,06,631. With this investment, around 14,06,252 beneficiaries, the calculated cost per beneficiary amounted to (INR) 2375. For the management of high-risk cases, the total calculated cost per beneficiary for high-risk management in TeCHO+ programme was (INR) 4827 and (INR) 4778 for eMamta based on secondary literature.

For management of high-risk cases, we added cost of receiving services at Community Health Centre and cost of specialist care (Gynaecologist) proposed by Prinja et al 2016 & 2017. The total calculated cost per beneficiary for high-risk management was (INR) 4827. Similarly, cost per beneficiary for high-risk management in eMamta was calculated as (INR) 4778. For children, calculated cost per beneficiary for high risk management was (INR) 3080 and (INR) 2732 for TeCHO+ and eMamta respectively.

Scenario analysis

We have two scenarios 1) Cost analysis without software development cost and 2) cost analysis with software cost derived from pilot project ImTeCHO.

TeCHO+ is based on success of ImTeCHO pilot. ImTeCHO software development cost was INR 46,00,000 at 2016-17 price. Annual maintenance cost was INR 36,74,375/-. The project was piloted in 11 PHCs. Thus for 1100 PHCs, one-time cost of software development was calculated as INR 46,00,00,000 at 2016-17. The annualized cost for software development is calculated as INR 36,74,37,500 and INR 53,22,35,151 for software maintenance at 2019-20 price. Total software cost

(including maintenance cost) calculated is INR 95,73,72,441.

Quality of data

Quality of data reporting in follow-up survey improved as compared to baseline for all the indicators except for full ANC and reporting of delivery in trust hospitals. Improvements are noted in the case of consumption of iron-folic acid (IFA) tablets, delivery reported in government hospitals, medical termination of pregnancy and early initiation of breastfeeding. The concordance rate for routine maternal health indicators (a measure of data accuracy) improved from 69.1% to 80.5%.

There is marked improvement specifically of the consumption of 180 IFA tablets (16.3 % increase in coverage) and initiation of breast feeding within an hour of birth (18.5% increase in coverage).

Improvement in coverage of important health indicators such as full ANC examination (80.1% vs 77.9%, p-value= ≤ 0.0001), consumption of at least 180 iron-folic acid tablets (93.5 % vs 77.2 %, p-value ≤ 0.0001), and early initiation of breast feeding (42.7% vs 24.2%, p-value ≤ 0.001) were found to be statistically significant at 5% level of significant and 95% Confidence Interval.

Improvement in quality of data reporting were observed for almost all the child health indicators during the follow-up survey. However, a marginal decline of quality of reporting was found for BCG vaccination at birth (change in concordance from 96.7 to 95.2 at follow-up) and full immunization (change in concordance from 89.6 to 87.5 at follow-up). The concordance rate for routine child health indicators improved from 86.6% to 92.1%.

Improvement in coverage of HBV0 vaccination (67.2% vs 35.3%, p-value<0.0001) and Pentavalent 2 (100% vs 95.1%, p-value=0.015) were found to be statistically significant at 5% level of significance and 95% Confidence Interval.

Matched case analysis

Since the eMamta data is considered as control, it could have resulted in bias in the analysis. To minimize this, propensity score method (PSM) was used to control demand side characteristics among women in intervention and control groups which could influence utilization of various MCH services. Thus, each woman in the intervention arm was matched on the basis of socio-demographic characteristics (such as religion, caste, region, socio-economic status).

After matching, the women from intervention and control arms (n=250 each) were similar in terms of all socio-demographic characteristics, except the distribution of religion. However, the difference was very small – 41.5% and 38.5% were Muslims in both intervention and control arm.

We found a statistically significant change in ANC/PNC visits, IFA consumption, high risk identification, referral, and breastfeeding within an hour between intervention and control arm. However, there was statistically insignificant change in institutional delivery, 2 TT received, and child immunization.

Cost-effectiveness

Cost-effective analysis for the TeCHO+ was done based using the decision tree model. From health system perspective, TeCHO+ incurs an incremental cost of INR 1802.84 per DALY averted of pregnant women and children which is 1.19% of the GDP per capita of India.

Sensitivity analysis shows that ICER remains largely unchanged even if the input parameter is changed in multiple indicators.

Budget Impact Analysis (BIA)

Budget Impact Analysis (BIA) has been performed to estimate the cost for the roll-out of IVIS intervention at the State level. State-wide scale-up for other states would cost INR 283,21,74,314 for the first year, with lower costs in subsequent years. This cost is exclusive of software cost as software cost is highly variable.

The nationwide scale cost covering 1,52,326 sub-centres in the country is projected. The budget for 1st year is INR 7804,66,95,803/-. The budget of subsequent years is on the lower side except for the fifth-year budget, which is higher (INR 8608,94,49,343) considering 90% of service coverage, mobile replacement and the need for training.

CONCLUSION

Cost-effectiveness analysis clearly shows that TeCHO+ is cost-effective for Mother and Child Care. It incurs an incremental cost of INR **1802.84** per DALY averted, which is below the GDP per capita of India.

Recommendations

The TeCHO+ programme is cost-effective and can be considered for replicating in other states or nationwide scale-up.