

Strengthening Health Management Information Systems in India: An Assessment

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INTRODUCTION

- Ministry of Health and Family Welfare (MoHFW) provide subsidized healthcare through various healthcare facilities/providers in India.
- Health facilities/providers maintain health records via the 'Health Management Information Systems (HMIS)' and report to MoHFW.
- Since 2005 National Rural Health Mission (NRHM) at MoHFW is strengthening HMIS to promote evidence-based decision making.
- Since health is a State subject, 28 States and 7 Union Territories (UTs), i.e., 636 Districts solicit NRHM's support for HMIS strengthening at their discretion.
- Validity of HMIS data is yet to be established.
- At present, 'District Level Household and Facility Survey (DLHS)' substitutes HMIS.
- Both DLHS III (2007-08) and HMIS (2009-10) generate data for 200+ health indicators.

OBJECTIVES

- Research Objective 1: Compare district level HMIS and DLHS III health data.
- Research Question 1: Are district level HMIS data comparable with DLHS III data for selected health indicators?
- Research Objective 2: Determine if NRHM's HMIS strengthening yield data that are comparable to DLHS.
- Research Question 2: Did the Districts of States that solicited support from NRHM for HMIS strengthening since 2005 (HMIS Early Districts) yield HMIS data in 2009-10 comparable to DLHS III for selected health indicators compared to the Districts of States that did not solicit support from NRHM until 2010 (HMIS Late Districts)?

METHODS

- Study Population: All Districts of India
- Sample selection and classification: All Districts (N=590, 92.76%)..of 27 States/UTs (77.14%) for which data for selected health indicators were available in either DLHS III or HMIS, classified as...
- HMIS Early Districts: 309 Districts of 13 States (Chhattisgarh, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Bihar, Uttaranchal, and West Bengal) that solicited NRHM's support since 2005.
- HMIS Late Districts: 281 Districts of 14 States (Andhra Pradesh, Arunachal Pradesh, Assam, Delhi, Haryana, Jharkhand, Manipur, Meghalaya, Mizoram, Rajasthan, Sikkim, Tamil Nadu, Tripura, and Uttar Pradesh) that did not solicit NRHM's support till 2010.
- Sample size: N=590 Districts of India (n=309 HMIS Early Districts, n=281 HMIS Late Districts)
- Data source: Abstraction of HMIS (2009-10) data from MoHFW WebPortal DLHS III (2007-08) data from DLHS III report

METHODS

- Selection of health indicators: Of 200+ health indicators available in both DLHS and HMIS only following 14 have similar definitions, hence comparable:

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|---|--|
| 1. % Antenatal care registration in 1 st trimester | 2. % Home deliveries NOT attended by skilled birth attendants |
| 3. % Home deliveries attended by skilled birth attendants | 4. % Newborns breastfed within 1hour of birth |
| 5. % Women given/received Iron Folic Acid during pregnancy | 6. % Women inserted with Intrauterine Device |
| 7. % Given/received condoms | 8. % Women given/received Oral Contraceptive Pills |
| 9. % Women given/received Emergency Contraceptive Pills | 10. % Men sterilized |
| 11. % Women sterilized | 12. % Women tested for HIV |
| 13. % Women attended for Post natal Complications | 14. % Women treated for Reproductive/Sexually Transmitted Infections |

- Study Design: Secondary data analysis using case-control design
- Data Processing: Subtract DLHS III data from HMIS data for 14 health indicators for each District and classify as:
 - Comparable: If difference was ± 0.00 to 9.99 points
 - Not Comparable: If difference was ± 10.00 to 100.00 points
- Statistical analysis: Chi-square test and logistic regression analysis (One-tailed test with $\alpha=0.05$, $p<0.05$, 95% Confidence Interval)

RESULTS

Table 1: Comparison of HMIS (2009-10) and DLHS III (2007-08) data, segregated by HMIS Early and HMIS Late Districts in India (N=590)

	All Districts (N=590, 100%)	HMIS Early Districts (n=309, 52.37%)	HMIS Late Districts (n=281, 47.62%)	p-value
% Antenatal care registration in 1 st trimester	206, 34.92%	114, 36.89%	92, 32.74%	0.609
% Home deliveries NOT attended by skilled birth attendants	112, 18.98%	56, 18.12%	56, 19.93%	0.210
% Home deliveries attended by skilled birth attendants	415, 70.34%	249, 80.58%	165, 58.72%	<0.001
% Newborns breastfed within 1hour of birth	69, 11.69%	38, 12.30%	31, 11.03%	0.464
% Women given/received Iron Folic Acid during pregnancy	64, 10.85%	28, 9.06%	36, 12.81%	0.086
% Women inserted with Intrauterine Device	557, 94.41%	299, 96.76%	258, 91.81%	0.653
% Given/received condoms	528, 89.49%	283, 91.59%	245, 87.19%	0.657
% Women given/received Oral Contraceptive Pills	524, 88.81%	292, 94.50%	232, 82.56%	0.001
% Women given/received Emergency Contraceptive Pills	560, 94.92%	301, 97.41%	259, 92.17%	0.354
% Men sterilized	550, 93.22%	294, 95.15%	256, 91.10%	0.204
% Women sterilized	40, 6.78%	0	40, 14.23%	<0.001
% Women tested for HIV	394, 66.78%	190, 61.49%	204, 72.60%	<0.001
% Women attended for Post natal Complications	2, 0.34%	1, 0.32%	1, 0.36%	0.710
% Women treated for Reproductive/Sexually Transmitted Infections	6, 1.02%	3, 0.97%	3, 1.07%	0.863

Numbers in bold indicate statistical significance, $p<0.05$.

RESULTS

Table 2. Logistic regression analysis indicating odds of HMIS (2009-10) data being comparable to DLHS III (2007-08) data among HMIS Early Districts compared to HMIS Late Districts in India (N=590)

	OR (95%CI)	p-value
% Home deliveries attended by skilled birth attendants	2.67 (1.81, 3.95)	<0.001
% Women given/received Oral Contraceptive Pills	3.39 (1.61, 7.16)	0.001
% Women tested for HIV	0.46 (0.31, 0.67)	<0.001

Due to zero cell count, logistic regression model for '% Women sterilized' did not converge.

OR: Odds Ratio

CI: Confidence Interval

Numbers in bold indicate statistical significance, $p<0.05$

- Of the 14 health indicators, data for which were compared in HMIS (2009-20) and DLHS III (2007-08), 5 contraceptive indicators (% Women inserted with Intrauterine Device, % Women given/received Emergency Contraceptive Pills, % Men sterilized, % Women given/received Oral Contraceptive Pills, % Given/received condoms) were 'comparable' in more than 80% Districts across the country. Data for these 5 contraceptive indicators were not comparable in few Districts of 14 States (Arunachal Pradesh, Assam, Haryana, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Sikkim, Tripura, Uttar Pradesh, Uttaranchal, West Bengal) in India.
- Data for 6 indicators (% Home deliveries attended by skilled birth attendants, % Newborns breastfed within 1hour of birth, % Women given/received Iron Folic Acid during pregnancy, % Women sterilized, % Women treated for Reproductive/Sexually Transmitted Infections, % Women attended for Post natal Complications) were comparable in <30% Districts of India.
- Greater proportion of 'HMIS Early Districts' had comparable data for 2 indicators (% Home deliveries attended by skilled birth attendants and % Women given/received Oral Contraceptive Pills) which were comparable in more than 70% Districts of the country., $p<0.05$.
- HMIS Early Districts were 3.39 (95% CI:1.61, 7.16, $p<0.05$) times and 2.67 (95% CI:1.81, 3.95, $p<0.05$) times more likely to yield comparable data for 'Women given/received Oral Contraceptive Pills' and 'Home deliveries attended by skilled birth attendants', respectively than HMIS Late Districts.

CONCLUSIONS

- HMIS (2009-10) data are comparable with DLHS III (2007-08) data for selected indicators in the country.
- HMIS Early Districts were more likely to yield comparable data compared to HMIS Late Districts, indicating that NRHM's support for HMIS strengthening need to be continued.
- Such comparison of data sources for other health indicators and same time periods can inform evidence-based decision making and planning of health programs.
- Other factors that contribute to HMIS strengthening need to be researched.