

The impact of digital antenatal care implementation on paper-based recordkeeping: results from an audit of antenatal records in primary healthcare facilities in Nepal



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BACKGROUND

Accurate recordkeeping is important to providing high-quality ANC. The mobile Health integrated model of hypertension, diabetes and antenatal care (mIRA) project aimed to improve antenatal care (ANC) quality in Nepal through tablet-based electronic decision support systems (EDSS). As a part of the implementation, electronic data entry was implemented alongside existing paper-based ANC records, adding an additional record-keeping requirement for health care providers. This sub-study of the mIRA project evaluation aims to assess the impact of introducing an EDSS on the completeness and agreement of existing paper-based ANC records.

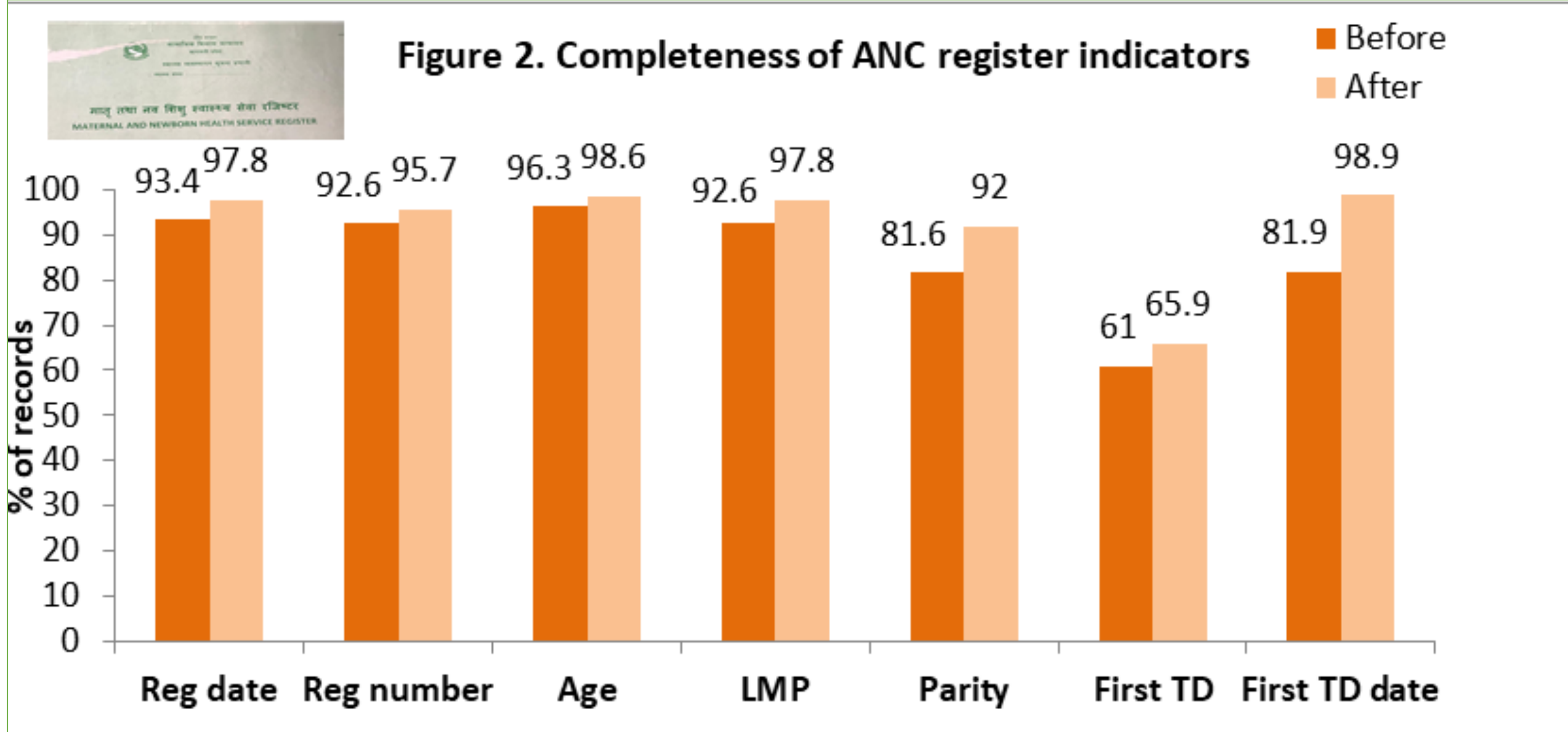
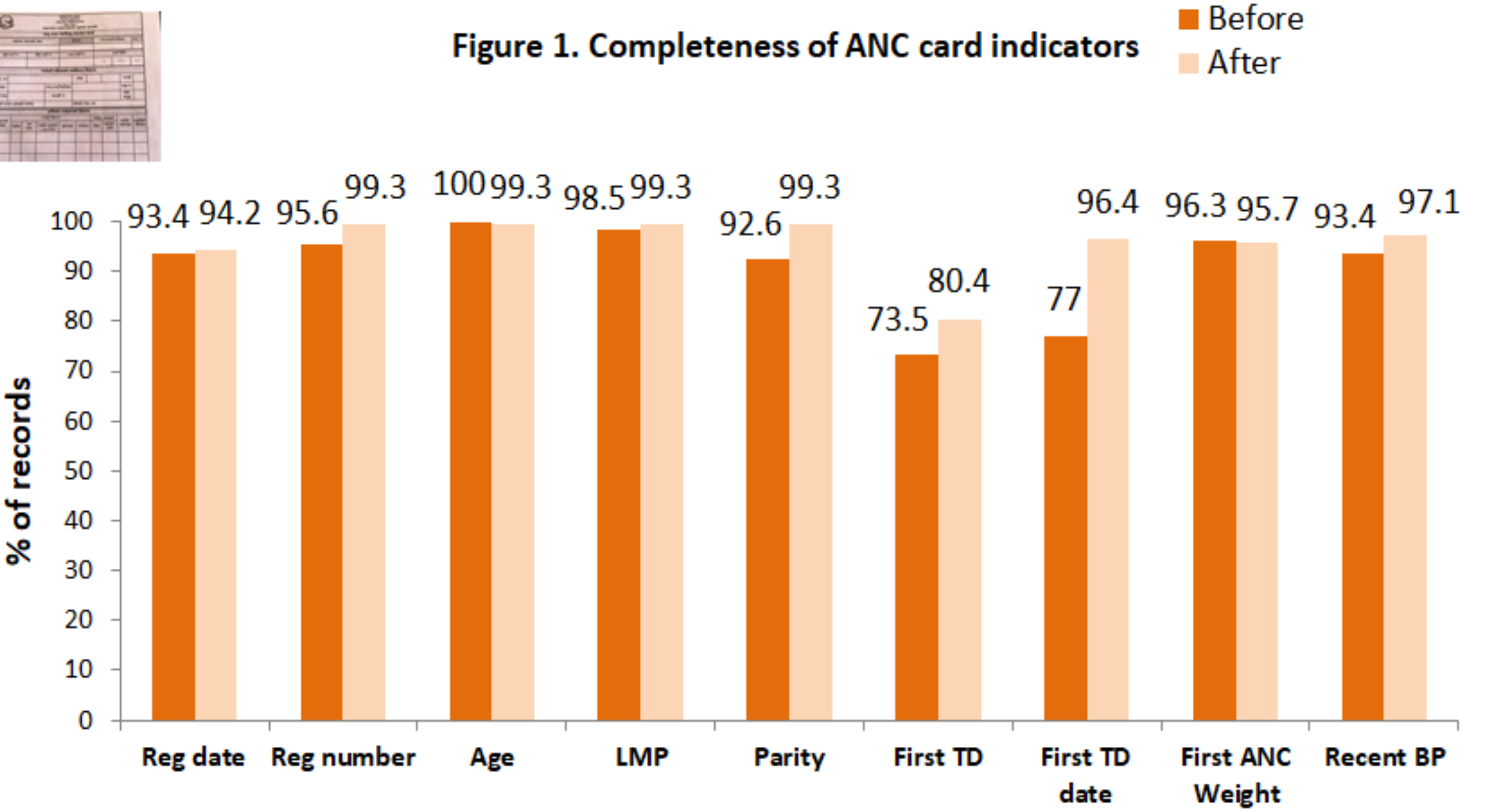
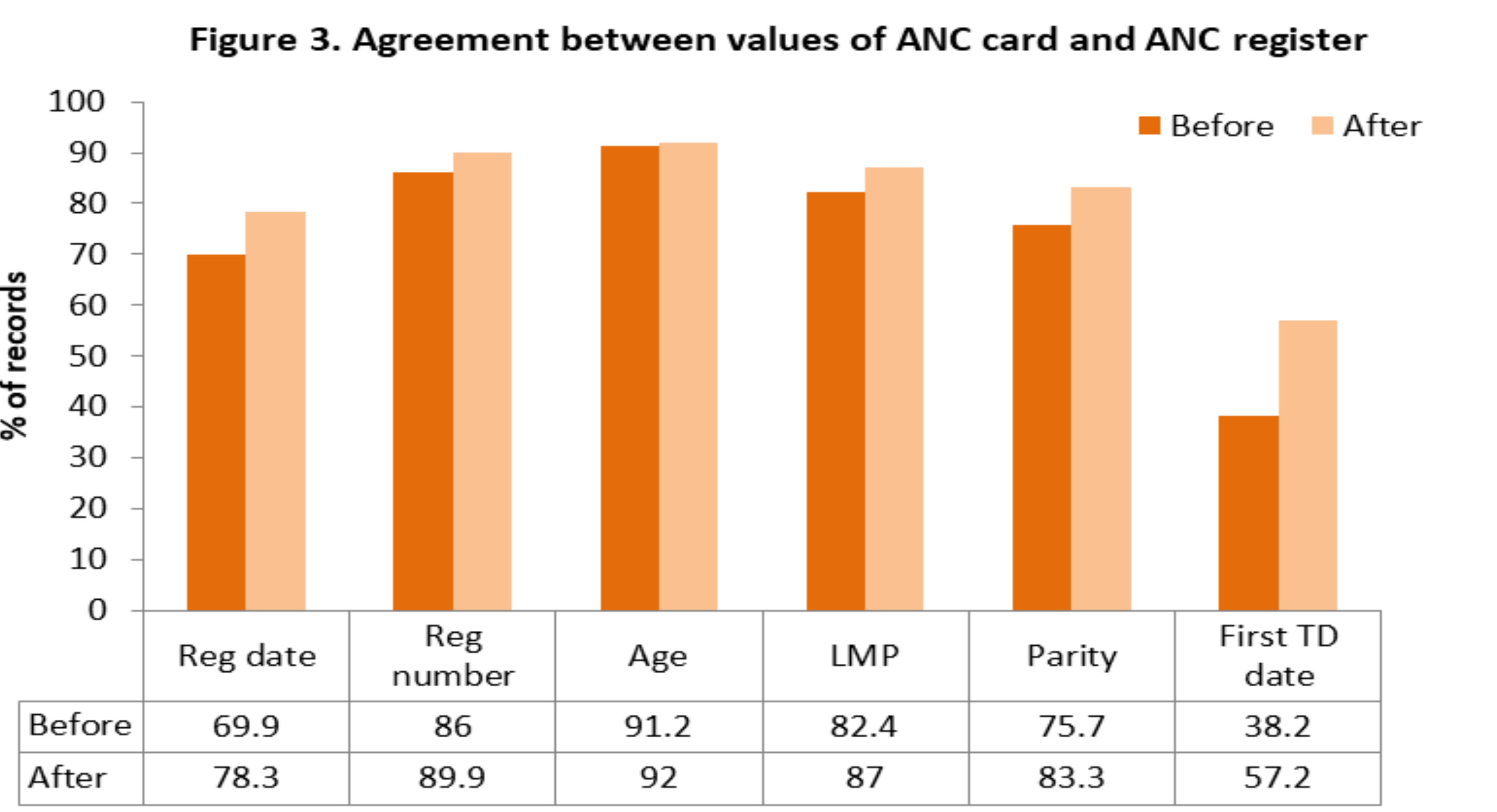
METHODOLOGY

The study was conducted in four rural districts in Bagmati Province, Nepal in 19 primary health facilities. We examined pregnant women’s records before (n=136) and after (n=138) EDSS implementation. For selected indicators in the ANC card and ANC register, we estimated the percentage completeness (any value recorded) and agreement (whether values matched), comparing results before and after implementation, and additionally comparing EDSS record values. Differences in completeness and agreement were estimated using chi-square and fisher’s exact test, as appropriate.

FINDINGS

Headline findings

- ANC indicators in the ANC card and ANC register showed **high completeness before the implementation**, and there was a general trend towards variables **being more complete after implementation** of the EDSS for both the ANC card and the ANC register.
- The completeness of variables in the **EDSS was low**; suggesting recordkeeping in ANC cards and ANC registers was **prioritized**.
- Percentage agreement **slightly increased** in all selected indicators of paper ANC records after an implementation.



Completeness of selected ANC indicators after implementation of WHO EDSS and mIRA EDSS								
Indicators	ANC card n (%)	ANC register n (%)	WHO-EDSS n (%)	p-value	ANC card n (%)	ANC register n (%)	mIRA-EDSS n (%)	p-value
Date of ANC registration	56 (90.3)	62 (100.0)	Not included ^b	<0.001	74 (97.4)	73 (96.1)	66 (86.8)	0.081
ANC registration number	62 (100)	61 (98.4)	55 (88.7)	0.002	75 (98.7)	71 (93.4)	66 (86.8)	0.010
Woman’s age	62 (100.0)	62 (100.0)	55 (88.7)	<0.001	75 (98.7)	74 (97.4)	66 (86.8)	0.003
Last menstrual period (LMP) date	62 (100.0)	62 (100.0)	55 (88.7)	<0.001	75 (98.7)	73 (96.1)	66 (86.8)	0.006
Parity	61 (98.4)	58 (93.5)	55 (88.7)	0.068	76 (100.0)	69 (90.8)	65 (85.5)	0.004
First TD vaccination received	46 (74.2)	36 (58.1)	55 (88.7)	0.001	65 (85.5)	56 (73.7)	29 (38.2)	<0.001
^a TD vaccination date	43 (93.5)	34 (94.4)	Not included ^b	<0.001	64 (98.5)	56 (100.0)	29 (100.0)	0.431
First ANC visit weight (KG)	58 (93.5)	Not included ^c	Not included ^b	NA	74 (97.4)	Not included ^c	65 (87.8)	0.025
Most recent Blood pressure	62 (100.0)	Not included ^c	55 (88.7)	0.013	72 (94.7)	Not included ^c	55 (72.4)	<0.001

^aTD vaccination date was calculated out of total TD vaccination first dose received.
^bDate of ANC registration, TD vaccine date, first ANC visit weight were not available in WHO EDSS.
^cFirst ANC visit weight and most recent blood pressure measurement was not available in ANC register.
Total number of records were 62 for WHO EDSS and 76 for mIRA EDSS.

CONCLUSION

EDSS did not have a negative impact on paper-based ANC records. The additional recordkeeping required by the EDSS resulted in general improvements in the completeness and agreement of ANC paper records. However, large-scale EDSS implementation should consider how to integrate digital and paper-based records to decrease burden on healthcare providers, and the standard of records should be audited on regular basis. Digital records are widely being used in high-income countries to improve documentation accuracy, enhance patients care, and provide better organization and access to data. The increasing implementation of electronic health records in low-resource settings increases the demand for evidence to understand the feasibility and impacts of digital health interventions in real-world settings.

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