



## Does the use of home-based records improve maternal, newborn and child health outcomes?

### Global use of home-based records

Home-based records (HBRs) are used in over 163 countries or territories. These records are paper- or electronic-based documents that pregnant women and caregivers commonly maintain and use in the household to monitor the health of the household's children. Moreover, they take HBRs to health facilities, when utilizing maternal and child health services. The contents of HBRs cover one or more components of preventive or curative antenatal, postnatal, newborn, and child health care, including vaccination and nutrition. These records may improve maternal, newborn and child health and development in both developed and developing countries.

### A systematic review of quantitative studies on home-based records

We conducted a systematic search in: (i) Medline; (ii) EMBASE; (iii) CENTRAL; (iv) Health Systems Evidence; (v) CINAHL; (vi) HTA database; (vii) NHS

EED; (ix) and DARE. We included randomized controlled trials, prospective controlled trials, and cost-effectiveness studies published between 1950 and 2017. We used the Cochrane Risk of Bias tool to appraise studies. We extracted and analyzed data for outcomes including maternal, newborn and child health, and women's empowerment. We synthesized and presented data using GRADE Evidence Profiles. We included 14 studies out of 16,419 identified articles.

### Improved maternal and newborn outcomes

HBRs helped pregnant women living in Mongolia and Indonesia remember antenatal care visits, thereby preventing missed appointments and increasing their total number of antenatal visits to meet national recommendations. Mothers using HBRs in Indonesia were also more likely to receive two doses of tetanus immunization (OR: 1.98 95% CI: 1.29–3.04). In Mongolia, there was no impact on smoking or alcohol consumption behaviors during pregnancy. The study



Article "Effectiveness of home-based records on maternal, newborn and child health outcomes: A systematic review and meta-analysis," 2019

Table 1. Summary of findings of select maternal care-seeking and self-care practices

No. of studies	Study design	Risk of bias	Quality assessment				Other considerations	No. of participants		Effect		Certainty (GRADE)	Importance
			Inconsistency	Indirectness	Imprecision			# Events/ Intervention	# Events/ Control	Relative (95% CI)	Absolute (95% CI)		
<b>Antenatal care visits: average number of visits</b> Studies: Mori, 2015 (Mongolia); Osaki, 2018 (Indonesia)													
2	cRCTs	Serious <sup>1</sup>	Not serious	Serious <sup>2</sup>	Not serious	None	Mori (2015): Mean 6.615 (± 1.525) Osaki (2018): Mean 6.3 (± 2.5)	Mori (2015): Mean 6.407 (± 1.765) Osaki (2018): Mean 5.6 (± 3.1)	Mori (2015): mean difference 0.208 (-0.710 to 1.125)	Not calculated	LOW	Critical	
<b>Antenatal care visits: six or more visits</b> Studies: Mori, 2015 (Mongolia); Osaki, 2018 (Indonesia)													
2	cRCTs	Serious <sup>1</sup>	Serious <sup>3</sup>	Serious <sup>2</sup>	None	None	306/436	285/519	OR 1.93 (1.48 to 2.53)	152 more per 1000 (94 more to 206 more)	VERY LOW	Critical	
<b>Antenatal care visits: four or more visits</b> Studies: Osaki, 2018 (Indonesia)													
1	cRCT	Serious <sup>1</sup>	Not serious	Not serious	Not serious	None	133/183	185/271	OR 1.25 (0.81 to 1.95)	Not calculated	MODERATE	Critical	
<b>Care seeking for pregnancy complications</b> Studies: Osaki, 2018 (Indonesia)													
1	cRCT	Serious <sup>1</sup>	Not serious	Not serious	Very serious <sup>4</sup>	None	11/13	36/53	OR 2.6 (0.52 to 13.04)	Not calculated	VERY LOW	Critical	
<b>Maternal immunization: TT2</b> Studies: Osaki, 2018 (Indonesia)													
1	cRCT	Serious <sup>1</sup>	Not serious	Not serious	Not serious	None	139/183	162/271	OR 1.98 (1.29 to 3.04)	Not calculated	MODERATE	Critical	
<b>Childbirth with a skilled birth attendant at a health facility</b> Studies: Osaki, 2018 (Indonesia)													
1	cRCT	Serious <sup>1</sup>	Not serious	Not serious	Serious <sup>5</sup>	None	79/183	106/271	OR 1.14 (0.75 to 1.74)	Not calculated	LOW	Critical	
<b>Care seeking for postpartum complications</b> Studies: Osaki, 2018 (Indonesia)													
1	cRCT	Serious <sup>1</sup>	Not serious	Not serious	Very serious <sup>6</sup>	None	4/6	8/28	OR 5.0 (0.76 to 32.93)	Not calculated	VERY LOW	Critical	
<b>Healthy pregnancy behaviours: smoking during pregnancy</b> Studies: Mori, 2015 (Mongolia)													
1	cRCT	Serious <sup>7</sup>	Not serious	Not serious	Very serious <sup>8</sup>	12 control participants received the intervention	5/253	7/247	RR 1.01 <sup>9</sup> (0.9 to 1.04)	Not calculated	VERY LOW	Critical	
<b>Healthy pregnancy behaviours: drinking during pregnancy</b> Studies: Mori, 2015 (Mongolia)													
1	cRCT	Serious <sup>7</sup>	Not serious	Not serious	Very serious <sup>8</sup>	12 control participants received the intervention	20/251	35/248	RR 1.07 <sup>10</sup> (0.97 to 1.18)	Not calculated	VERY LOW	Critical	

<sup>1</sup> Allocation concealment and attrition bias

<sup>2</sup> Differences in comparison groups (sporadic availability of HBRs vs delay of 7 months)

<sup>3</sup> Mori (2015) reports no effect on outcome; Osaki (2018) reports significant effect

<sup>4</sup> Very low number of events (<100) and wide confidence intervals

<sup>5</sup> Low number of events (<300)

<sup>6</sup> Low number of events (<300) and wide confidence intervals

<sup>7</sup> Serious concerns regarding confounding

<sup>8</sup> Very low number of events (<100)

<sup>9</sup> In Mori (2015) 12 control participants received the intervention

<sup>10</sup> Risk Ratio



A mother and her child waiting for immunization, Timor-Leste (K Imamura)

in Mongolia also reported that HBRs facilitated the identification of pregnancy complications, however, there was no impact on newborn health outcomes such as neonatal death, stillbirth, or immediate breastfeeding.

### Improved child vaccination coverage

Among child health outcomes, evidence indicates that HBRs may have an impact on immunization. In Pakistan, studies conducted in both rural and urban areas showed that using a redesigned immunization card resulted in a significant improvement in diphtheria-pertussis-tetanus (DPT) immunization uptake, compared to a standard Expanded Program on Immunization (EPI) card (OR: 2.39, 95% CI: 1.45–3.92, Figure 1). In Indonesia, after using an HBR, there were fewer underweight children and fewer stunted children. In Mongolia, a three-year follow-up showed a reduced risk of cognitive development delay in children ( $P = 0.007$ ). These findings can be explained by the frequent use of the part of the HBR that increases mothers' awareness of their children's developmental milestones and enhances their efforts to interact with their children.

### Improved communications, empowerment and continuity of care

HBRs used among women and children in Indonesia bring about benefits in practicing continuity of maternal and child health care. The use of HBRs contributed to improvement of patient-provider communication, enhancement of women's feelings of control, and thereby empowerment of women. HBRs are likely to have modest but important effects on maternal and child health. These effects with minimal-to-no harms, multiplied across a population, could play an important role in reducing health inequities in maternal, newborn, and child health.

### Conclusion

While several studies report on the prevalence of

different kinds of HBRs between countries, the design, use and complexity of these records vary. Countries have identified the need for a standardized HBR to improve data transferability and secure the accuracy of data recording and transcription. With a standardized design and proper utilization between different health workers, these records could promote continuous maternal and child health care. Since each country has its own challenges in delivering health care, different regional, social, and economic factors affect their ability to deliver proper health services to women and children. A need for stakeholder engagement were highlighted, particularly in the design, distribution, and implementation of HBRs for maternal and child health, to ensure the successful uptake and sustainability of these records. Additionally, there is a need for high quality evidence that compares electronic versus paper records, as well as more research that compares integrated HBRs (e.g., MCH Handbooks) and standalone HBRs (e.g. vaccination card and growth chart). Note that we could not identify any formal studies on cost or economic evaluation of HBRs.

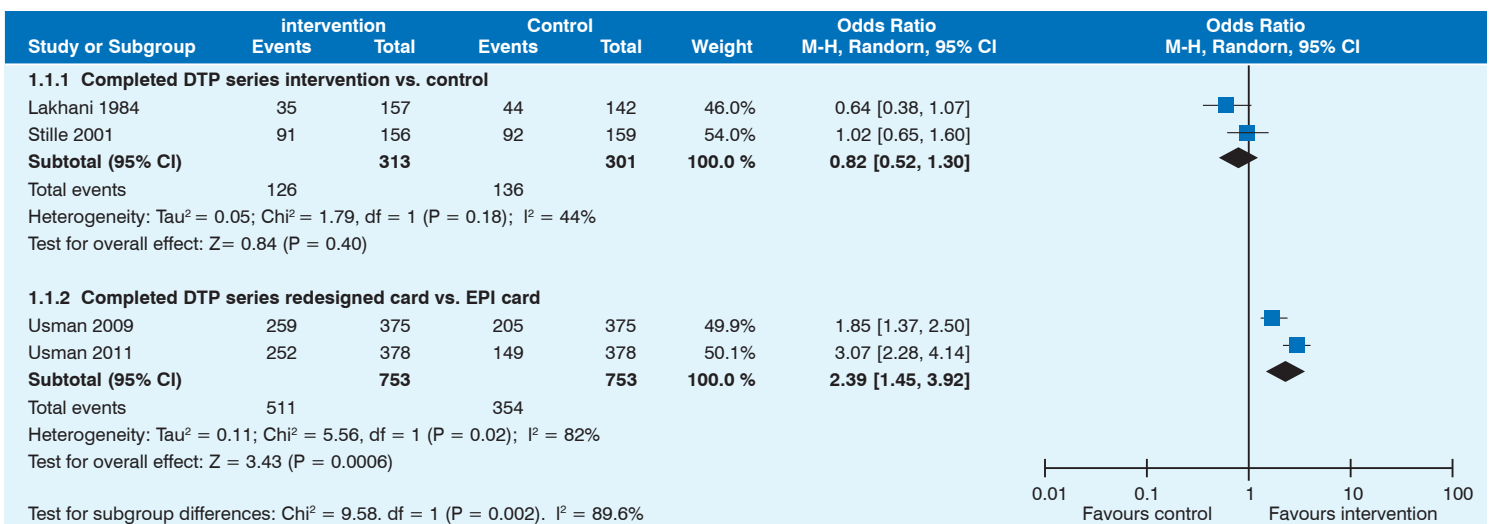
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#### Further readings

1. Magwood O et al. Effectiveness of home-based records on maternal, newborn and child health outcomes: A systematic review and meta-analysis. *PLoS One* 2019; **14**(1): e0209278.
2. Magwood O et al. Understanding women's, caregivers', and providers' experiences with home-based records: A systematic review of qualitative studies. *PLoS One* 2018; **13**(10): e0204966.
3. The World Health Organization (2018) *WHO recommendations on home-based records for maternal, newborn and child health*. Geneva: World Health Organization.



▲ Figure 1. Meta-analysis of childhood vaccination (DTP) series completion among individuals using HBRs as compared to no HBR (1.1.1) or existing EPI cards (1.1.2)