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Home-based record prevalence among children aged 12–23 months from 180 demographic and health surveys

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ABSTRACT

Background: There is currently a re-focus at the global level on the importance of the home-based record within vaccination service delivery as an important information resource but there are few reports of ever and current home-based record prevalence across countries.
Methods: We considered all Demographic and Health Surveys (starting with DHS round 3) conducted between 1993 and 2013 for which a final dataset was available in the public domain at the time of the analysis. Ever and current prevalence of home-based records for recording vaccination was estimated for children aged 12–23 months at the time of the survey through a secondary analysis of data from 180 Demographic and Health Surveys conducted in 67 countries derived from questions asked of women aged 15–49 years for their children on home-based record availability and retention. *Ever* home-based record prevalence is the proportion of children aged 12–23 months who have ever received a home-based record. *Current* home-based record prevalence is the proportion of children aged 12–23 months for whom a home-based record was available for viewing by the surveyor at the time of the survey.
Results: Estimated ever home-based record prevalence was ≥90% in 116 surveys from 52 countries and was <70% in 15 surveys from 7 countries. Estimated current home-based record prevalence was ≥80% in 31 surveys from 23 countries and was <50% in 51 surveys from 24 countries. Current home-based record prevalence was <80% as of the most recent survey during 2010–2013 for five (Bangladesh, Ethiopia, Nigeria, Indonesia and Pakistan) of the ten countries with the largest birth cohorts globally. Among 34 countries that conducted three or more DHS, we observed improvements in both ever and current home-based record prevalence of >10% points in six countries. Current home-based record prevalence increased >10% points in six countries where the ever prevalence was maintained at ≥90% across the period of observation. And, no meaningful change was observed in estimated ever and current home-based record prevalence in 11 countries, five of which maintained ever prevalence ≥90% across the period of observation. High home-based record loss rates were observed in many countries.
Conclusions: The results here show that despite improvements in the availability, utilization and retention of home-based records for recording vaccination history in some countries, opportunities remain to change the mind-set in many national immunization programmes around the importance of the home-based record, particularly in countries with large birth cohorts. Immunization programmes are encouraged to monitor ever and current home-based record prevalence. Nationally representative household surveys collecting information on immunization coverage should include ever and current home-based record prevalence in the standard survey reports and tables to better enable programme managers to identify problems and target corrective action.

1. Introduction

There is currently a re-focus at the global level on the importance of the home-based record within vaccination service delivery as an important information resource to enhance health professionals' ability to make clinical decisions and prevent unnecessary repetition of vaccination, to empower patients/caregivers around immunization services, and to support public health monitoring [1–3]. In the area of immunization performance monitoring, home-based records fill a gap where facility-based registers often fall short, such as for supporting outreach activities to vaccinate un-/under-immunized children and serving as a source of documented

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vaccination history in household coverage surveys [1]. In household coverage surveys, evidence of vaccination history is predominantly driven by confirmation of vaccination records maintained in the household. At the time of this writing, few household coverage surveys visit health facilities to document vaccination history (i.e., facility trace back) perhaps due to additional cost and challenges of incomplete health facility records.

The presence of documented vaccination history on home-based records at the time of a household survey is determined in part by (i) health workers providing a home-based record to an individual or her caregiver (ideally free-of-charge) at the first immunization encounter or before, (ii) the patient or caregiver bringing the document to every health encounter, (iii) the home-based record being appropriately and legibly updated with the vaccination history at the time of vaccination service delivery, and (iv) the successful retention of the home-based record, free of damage, in the household. Challenges persist, however, for national programmes and global monitoring efforts [4,5] that use surveys to estimate vaccination coverage when home-base records are not routinely employed as a result of reporting errors that occur when caregivers misclassify a child's vaccination history during recall in lieu of documentation. Cutts and colleagues [6] note the latter may become an increasing problem as recommended immunization schedules become more complex with multiple injectable and oral vaccines administered at the same clinic visit.

To monitor success in providing home-based records to newborns or their caregivers at birth or the first immunization encounter in order to meet the above needs, immunization programmes (or health systems) are encouraged to track the proportion of children who have ever received a home-based record, i.e., *ever* home-based record prevalence. Low ever home-based record prevalence indicates system problems around assuring availability and access to this basic recording tool, including failures in forecasting needs for printed quantities or more broad logistics management issues as well as presence of barriers (e.g., financial) to access [3]. Beyond assuring the availability of the record, immunization programmes are also encouraged to track *current* home-based record prevalence, i.e., the proportion of children for whom a home-based record is available for viewing at any given point in time. Current home-based record prevalence is a function of availability of a record and retention of a record once received. Low current home-based record prevalence levels may indicate problems among caregivers with regards to acceptance or value placed on the document as well as suboptimal record design and/or durability.

Prior reports [1] have highlighted *current* home-based record prevalence derived from surveys, but we are unaware of prior work describing *ever* home-based record prevalence across countries. In this report, we present estimated country-specific ever and current home-based record prevalence from nationally representative household surveys.

2. Methods

We considered all Demographic and Health Surveys (DHS) (starting with DHS round 3) conducted between 1993 and 2013 for which a final dataset was available in the public domain at the time of the analysis. Two surveys (Senegal, 1997 and Ukraine, 2007) conducted during the period were not analysed because they did not include the immunization module. A detailed description of the Demographic and Health Survey programme is available online at www.dhsprogram.com

For this analysis, we estimated ever and current prevalence of home-based records for recording vaccination through a secondary analysis of data from 180 Demographic and Health Surveys conducted in 67 countries. Because of the rapid release of new survey results by the DHS programme, the 180 surveys included here may not reflect all DHS conducted during this period, particularly for 2012 and 2013. A detailed listing of all surveys included is shown in Annex 1 and a summary of the number of surveys and survey sample size is shown in Table 1.

In each survey, questions on home-based record availability and retention were asked of women aged 15–49 years for their children aged 0–59 months (and who were alive) at the time of the

Table 1
Summary* of estimated ever and current prevalence of home-based records for vaccination among children aged 12–23 months at the time of survey from 180 Demographic and Health Surveys conducted between 1993 and 2013 by World Health Organization regional classification.

	AFR	AMR	EMR	EUR	SEAR	WPR
No. of surveys	90 (conducted in 35 countries)	35 (conducted in 10 countries)	11 (conducted in 4 countries)	15 (conducted in 9 countries)	19 (conducted in 6 countries)	10 (conducted in 3 countries)
Survey sample size**						
Median value	1281	1564	2030	371	1402	1397
Minimum	369 (COM, 1996)	75 (DOM, 1999)	1154 (MCO, 2003)	253 (KAZ, 1999)	843 (MDV, 2009)	467 (VNM, 2002)
Maximum	5834 (NGA, 2013)	3435 (COL, 2010)	2746 (EGY, 2005)	1024 (TJK, 2012)	10,209 (IND, 1998)	1812 (PHL, 1993)
Ever HBR prevalence						
Median value (%)	92	98	99	98	84	91
Minimum	42% (TCD, 2004)	79% (BOL, 1994)	75% (PAK, 2006)	81% (AZE, 2006)	64% (NPL, 1996)	59% (VNM, 1997)
Maximum	100% (STP, 2008)	99% (HND, 2005)	99% (JOR, 1997)	99% (KAZ, 1999)	99% (MDV, 2009)	97% (PHL, 2013)
Current HBR prevalence						
Median value (%)	66	72	73	90	39	42
Minimum	19% (NGA, 1999)	35% (BOL, 1994)	24% (PAK, 2006)	39% (TUR, 1998)	16% (NPL, 2001)	13% (VNM, 1997)
Maximum	93% (STP, 2008)	90% (HND, 2011)	90% (JOR, 2007)	98% (ALB, 2008)	89% (MDV, 2009)	77% (KHM, 2010)
HBR loss rate***						
Median value (%)	27	24	26	9	51	51
Minimum	7% (STP, 2008)	9% (GUY, 2009)	9% (JOR, 2007)	0% (ARM, 2000)	11% (MDV, 2009)	18% (KHM, 2010)
Maximum	67% (NGA, 1999)	56% (BOL, 1994)	68% (PAK, 2006)	55% (TUR, 1998)	78% (NPL, 2001)	79% (VNM, 1997)

Note: The unit of analysis for the table is 180 survey. For the minimum and maximum values, the country and year of survey is reported in parentheses. *Abbreviations:* AFR, African Region; AMR, Region of the Americas; EMR, Eastern Mediterranean Region; EUR, European Region; SEAR, South-East Asia Region; WPR, Western Pacific Region; HBR, home-based record.

* A complete listing of surveys and HBR prevalence values is available in Annex 1.

** Unweighted.

*** HBR loss rate = $\left((\text{ever home based record prevalence} - \text{current home based record prevalence}) / (\text{ever home based record prevalence})\right) \times 100\%$.