

COMMENTARY

Child Immunization Cards: Essential Yet Underutilized in National Immunization Programmes

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Abstract: The child immunization card is an inexpensive yet effective instrument for systematically recording the vaccines received by a child. Moreover, the card can enhance health professionals' ability to make clinical decisions, empower parents/caregivers in the health care of their children, and support public health monitoring. Unfortunately, the child immunization card is too often underutilized or inappropriately used by parents and health care workers and therefore does not always fulfil its intended purpose. National immunization programmes should be encouraged to procure cards in conjunction with other necessary vaccination supplies and to more actively promote the issuance and appropriate use of the card.

Keywords: Immunization cards, immunization, recording, monitoring.

INTRODUCTION

Monitoring childhood immunization status is an important public health activity. In many countries, a child's immunization status is recorded in registries, sometimes electronic and often not, that are maintained at health facilities. Although registers provide a potentially important source of information for assessing trends, responding to emerging threats and guiding development of policies and interventions, registers are often not used in outreach activities to identify unimmunized children and at times are difficult to use to trace back a child's immunization history. Fortunately, the child immunization card, one of the most simple personal health records available, can be used to fill these gaps.

Child immunization cards provide a systematized way of recording the vaccines received by children as recommended by national and international health authorities [1]. More importantly, the child immunization card is a point-of-care information resource that can (1) enhance health professionals' ability to make clinical decisions and prevent unnecessary repetition of vaccination, (2) empower parents/caregivers in the health care of their children, and (3) support public health monitoring.

The successful utilization of child immunization cards by national immunization programmes requires that the card be issued to parents (caregivers) at the birth of the child or at the first contact with a vaccinator/health care worker and that the card be retained and brought to each encounter the child has with the health care system. As such, information would be collected at all health consultations including sick- and well-visits conducted at a health clinic/post as well as any

supplementary immunization activity (e.g., a measles campaign in a village), although presentation of cards at the latter is rarely practiced. Finally, the successful use of the card requires that all health care workers, who come into contact with the child, reference the card and accurately and legibly update the card so that the information on the card is correctly interpreted and translated into appropriate medical advice and action [2].

When properly used, child immunization cards provide a relatively inexpensive and effective instrument in the promotion of childhood immunization and child health more generally [3]. In addition, the cards allow the addition of essential health information including a record of birth data such as the birth date and birth weight, a visual record of the child's growth, factors that may affect the child's ability to develop normally or adapt to a new environment, as well as a continuous and permanent record of the child's development by recording the medical and social history. These more comprehensive child health cards are viewed by many as advantageous because they inherently emphasise the place of immunization within the context of the child's overall health and development rather than being viewed as an end in itself [4]. Regardless of type (immunization card or health card), the utilization of cards has been associated with improvements in the uptake of preventive health services, such as immunizations [5], and with up-to-date [6] and fully immunized [7,8] children as well as serving as a reference for health care workers [9].

Immunization cards also have an important role in improving parental awareness and involvement in their child's health care. Research has shown that missed opportunities for immunization are often the result of parental lack of awareness of the benefits of vaccines as well as a lack of awareness of the vaccination schedule and when their child is due for his/her next vaccine [10,11]. Although most cards incorporate such information, opportunities

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Table 1. Prevalence (%) of Immunization or Health Cardholders at the Time of Survey by Select Background Characteristics in 87 Countries with a DHS or MICS Survey, 2000–2010

	Survey	95%L P* 95%U Overall	Sex		Residence		Wealth Quintile				
			Male	Female	Urban	Rural	Lowest	2nd	Middle	4th	Highest
North Africa											
Algeria	MICS 2006	92	93	92	92	93	91	95	94	94	88
Egypt	DHS 2000	71 73 75	73	73	69	75	70	74	77	77	63
Egypt	DHS 2003	71 74 77	75	73	71	76	71	76	82	73	65
Egypt	DHS 2005	71 73 75	74	73	71	74	75	74	75	71	71
Egypt	DHS 2008	67 69 71	70	67	68	69	68	65	71	69	69
Morocco	DHS 2003-04	75 78 81	78	78	84	72	69	75	84	83	84
sub-Saharan Africa											
Benin	DHS 2001	70 73 77	71	76	75	73	::	::	::	::	::
Benin	DHS 2006	64 66 68	66	67	67	66	56	66	69	70	71
Burkina Faso	DHS 2003	62 67 71	68	65	82	65	55	59	67	74	82
Burkina Faso	MICS 2006	79	79	79	91	76	81	75	74	78	91
Burkina Faso**	DHS 2010	83	85	81	85	83	::	::	::	::	::
Burundi	MICS 2005	64	65	63	64	64	59	67	68	66	57
Burundi**	DHS 2010	62	61	63	52	63	::	::	::	::	::
Congo (Brazzaville)	DHS 2005	55 60 65	60	59	73	48	37	53	64	75	77
Congo, Democratic Rep	DHS 2007	20 24 28	26	23	29	22	15	28	26	20	35
Cote d'Ivoire	MICS 2006	73	74	71	84	66	56	68	75	84	89
Cameroon	DHS 2004	54 57 60	56	59	61	54	47	63	55	60	65
Cameroon	MICS 2006	66	68	65	69	65	59	66	66	68	75
Cape Verde	DHS 2005	77 81 85	83	80	81	82	::	::	::	::	::
Central African Republic	MICS 2006	37	35	38	49	29	22	31	33	44	56
Chad	DHS 2004	19 25 31	24	25	33	22	8	20	25	34	34
Eritrea	DHS 2002	73 77 81	76	78	83	73	70	72	76	82	84
Ethiopia	DHS 2000	24 27 30	28	26	51	24	20	18	23	32	48
Ethiopia	DHS 2005	34 37 40	39	35	62	35	31	31	39	35	52
Ethiopia**	DHS 2010	29	26	32	55	24	::	::	::	::	::
Gabon	DHS 2000	59 63 67	65	61	65	57	48	60	68	72	68
Gambia	MICS 2005-06	91	90	91	88	92	96	89	91	88	88
Ghana	DHS 2003	80 83 86	85	81	85	82	80	84	87	80	86
Ghana	MICS 2006	85	83	88	82	87	86	84	87	88	81
Ghana	DHS 2008	83 86 89	86	86	81	89	91	86	82	86	84
Guinea	DHS 2005	49 54 59	53	54	67	50	40	48	55	63	70
Guinea-Bissau	MICS 2006	78	79	78	78	78	76	78	78	79	80
Kenya	DHS 2003	56 60 64	58	62	48	62	55	66	64	65	50

Table 1. contd....

	Survey	95%L P* 95%U Overall	Sex		Residence		Wealth Quintile				
			Male	Female	Urban	Rural	Lowest	2nd	Middle	4th	Highest
sub-Saharan Africa											
Kenya	DHS 2008-09	70	69	72	55	75	72	75	80	72	56
Lesotho	DHS 2004	74 78 82	77	78	78	78	73	74	78	85	79
Lesotho	DHS 2009	70 74 79	73	76	68	76	73	80	78	73	68
Liberia	DHS 2007	43 48 53	45	51	58	43	35	38	55	57	59
Madagascar	DHS 2003-04	44 50 56	46	54	55	49	35	50	52	64	60
Madagascar	DHS 2008-09	57 60 63	60	61	71	59	46	58	64	69	74
Malawi	DHS 2000	79 81 83	79	83	77	82	79	80	81	86	80
Malawi	DHS 2004	72 74 76	75	73	74	74	68	70	81	75	81
Malawi	MICS 2006	77	78	76	80	76	74	78	77	78	79
Mali	DHS 2001	45 48 51	48	48	64	43	41	42	40	51	71
Mali	DHS 2006	58 61 64	64	58	62	60	63	59	62	59	63
Mauritania	DHS 2000-01	30 34 38	35	34	39	31	29	36	35	27	47
Mauritania	MICS 2007	32	31	34	31	33	31	38	34	29	31
Mozambique	DHS 2003	75 78 81	79	77	86	75	64	80	78	86	90
Mozambique	MICS 2008	85	85	85	90	83	78	81	87	89	91
Namibia	DHS 2000	70 74 78	72	75	68	76	74	78	75	70	72
Namibia	DHS 2006-07	70 73 76	74	73	70	76	77	71	74	74	69
Niger	DHS 2006	39 43 47	44	42	75	37	32	42	32	40	71
Nigeria	DHS 2003	17 21 25	20	23	36	15	12	13	16	26	42
Nigeria	MICS 2007	18	18	19	28	14	6	10	15	29	31
Nigeria	DHS 2008	24 26 28	26	26	39	21	8	17	26	36	52
Rwanda	DHS 2000	63 66 69	68	64	64	67	65	66	64	68	68
Rwanda	DHS 2005	73 76 79	75	77	69	77	71	77	78	78	75
Rwanda	DHS 2007-08	63 67 71	65	69	64	68	66	68	70	67	62
Sao Tome and Principe	MICS 2006	91	88	93	87	95	93	93	94	86	88
Sao Tome and Principe	DHS 2008-09	90 93 96	92	95	92	94	90	91	97	::	94
Senegal	DHS 2005	67 70 73	70	70	69	71	71	67	71	70	72
Sierra Leone	MICS 2005	53	54	52	50	54	42	48	60	60	53
Sierra Leone	DHS 2008	57 60 63	61	59	58	61	58	64	61	58	58
Somalia	MICS 2006	8	10	6	15	4	3	4	11	10	12
South Africa	DHS 2003	65 71 77	71	71	67	79	::	::	::	::	::
Swaziland	DHS 2006-07	81 84 87	84	84	75	86	89	85	83	86	77
Tanzania, United Rep.	DHS 2004-05	76 79 82	78	80	79	79	75	77	80	85	78
Tanzania, United Rep.	DHS 2010	82 84 87	84	85	85	84	82	87	83	85	85

Table 1. contd....

	Survey	95%L P* 95%U Overall	Sex		Residence		Wealth Quintile				
			Male	Female	Urban	Rural	Lowest	2nd	Middle	4th	Highest
sub-Saharan Africa											
Togo	MICS 2006	70	69	72	77	66	64	61	72	77	80
Uganda	DHS 2000-01	44 47 50	48	47	43	48	48	46	49	47	48
Uganda	DHS 2006	60 63 66	64	62	63	63	59	67	66	62	59
Zambia	DHS 2001-02	77 80 83	78	81	81	79	::	::	::	::	::
Zambia	DHS 2007	75 78 81	79	77	79	78	80	79	74	77	80
Zimbabwe	DHS 2005-06	69 72 75	69	76	75	71	70	70	73	75	75
Caribbean and Latin America											
Belize	MICS 2006	64	73	54	65	63	::	::	::	::	::
Bolivia	DHS 2003	77 79 81	77	80	79	79	75	82	79	82	75
Bolivia	DHS 2008	74 77 80	78	75	79	74	72	78	79	80	75
Colombia	DHS 2000	72 75 78	75	74	76	71	::	::	::	::	::
Colombia	DHS 2005	76 78 80	80	76	80	74	73	75	83	80	83
Colombia	DHS 2010	81 83 85	84	82	82	85	84	86	84	82	77
Cuba	MICS 2006	98	98	97	97	99	::	::	::	::	::
Dominican Republic	DHS 2002	47 50 53	49	51	50	51	44	46	55	55	54
Dominican Republic	DHS 2007	59 62 65	61	63	61	64	59	57	61	69	67
Guyana	MICS 2006-07	75	71	80	76	75	72	71	80	78	78
Guyana	DHS 2009	83 88 92	87	88	85	88	84	91	92	88	87
Haiti	DHS 2000	61 66 71	67	66	70	64	59	60	74	63	80
Haiti	DHS 2005-06	69 73 77	75	71	77	71	67	72	74	72	83
Honduras	DHS 2005-06	83 85 87	85	85	80	88	90	87	86	81	77
Jamaica	MICS 2005	74	76	72	72	76	::	::	::	::	::
Nicaragua	DHS 2001	76 79 82	80	77	77	80	77	82	83	78	72
Peru	DHS 2000	55 58 61	59	57	63	52	53	56	60	66	60
Peru	DHS 2004	61 67 72	65	68	69	63	62	68	72	57	81
Peru	DHS 2004-06	63 66 70	68	65	67	65	67	65	69	57	79
Peru	DHS 2007-08	59 63 66	65	61	62	64	63	70	60	56	62
Peru	DHS 2009	63 66 69	67	65	66	66	68	68	62	66	65
Peru	DHS 2010	73 76 78	77	74	::	::	80	76	78	74	67
Suriname	MICS 2006	81	79	83	81	::	79	87	86	79	77
Trinidad and Tobago	MICS 2006	79	77	81	::	::	::	::	77	::	::
Caucasus and Central Asia											
Armenia	DHS 2000	91 94 97	::	::	93	96	::	::	::	::	::
Armenia	DHS 2005	87 92 97	94	89	92	91	91	92	96	93	::
Armenia**	DHS 2010	92	91	94	90	96	::	::	::	::	::
Azerbaijan	DHS 2006	66 72 78	79	65	75	70	57	72	82	67	86

Table 1. contd....

	Survey	95%L P* 95%U Overall	Sex		Residence		Wealth Quintile				
			Male	Female	Urban	Rural	Lowest	2nd	Middle	4th	Highest
Caucasus and Central Asia											
Kazakhstan	MICS 2006	95	96	95	97	93	96	95	93	96	96
Tajikistan	MICS 2005	83	85	81	85	82	81	86	81	84	84
Turkmenistan	DHS 2000	94	94	94	89	98	99	99	95	91	87
Uzbekistan	MICS 2006	96	96	96	92	98	97	98	97	96	92
Western Asia											
Iraq	MICS 2006	55	58	53	61	47	::	::	::	::	::
Jordan	DHS 2002	75 78 81	77	78	76	84	85	81	79	73	58
Jordan	DHS 2007	88 90 92	88	92	91	87	91	92	90	90	85
Turkey	DHS 2003	49 54 59	57	51	63	34	::	::	::	::	::
Yemen	MICS 2006	48	50	47	51	47	44	39	44	55	62
Southern Asia											
Bangladesh	DHS 2004	46 49 52	47	52	58	47	44	46	48	52	61
Bangladesh	MICS 2006	66	66	65	66	65	62	64	68	68	66
Bangladesh	DHS 2007	54 58 62	58	58	60	58	62	54	56	63	56
India	DHS 2005-06	36 38 40	39	36	46	35	26	32	39	43	56
Maldives	DHS 2009	86 89 92	88	90	85	91	92	93	89	86	85
Nepal	DHS 2001	14 16 18	17	15	18	16	11	16	16	20	22
Nepal	DHS 2006	27 32 37	34	30	43	30	23	29	36	35	43
Nepal	DHS 2010	34	38	30	39	33	::	::	::	::	::
Pakistan	DHS 2006-07	21 24 27	24	24	26	23	13	20	26	26	36
South-Eastern Asia											
Cambodia	DHS 2000	44 48 52	47	49	49	47	42	40	44	54	70
Cambodia	DHS 2005	64 67 70	69	64	63	67	57	69	66	73	73
Indonesia	DHS 2002-03	28 31 34	30	32	32	30	23	25	39	34	34
Indonesia	DHS 2007	34 37 40	38	36	38	36	26	36	38	46	39
Lao PDR	MICS 2006	49	48	50	56	44.2-49.2	41	44	60	53	55
Philippines	DHS 2003	36 39 42	41	36	38	40	32	46	47	37	32
Philippines	DHS 2008	43	43	42	43	42	37	43	45	47	42
Thailand	MICS 2005-06	88	89	87	85	90	90	93	85	90	82
Timor-Leste	DHS 2009-10	47 50 53	52	47	44	52	43	51	52	57	45
Vietnam	DHS 2002	34 40 46	40	40	59	36	24	38	39	38	68
Vietnam	MICS 2006	38	36	42	54	34	::	::	::	::	::
Eastern Asia											
Mongolia	MICS 2005	81	81	80	79	82	76	80	89	81	77
Oceania											
Vanuatu	MICS 2007	69	67	71	66	69	65	71	66	75	::

Table 1. contd....

	Survey	95%L P* 95%U Overall	Sex		Residence		Wealth Quintile				
			Male	Female	Urban	Rural	Lowest	2nd	Middle	4th	Highest
Industrialized											
Belarus	MICS 2005	99	99	99	99	99	99	99	99	99	99
Bosnia and Herzegovina	MICS 2006	77	76	78	71	80	76	79	79	74	76
Macedonia	MICS 2005	75	71	79	83	66	67	84	73	81	65
Moldova	DHS 2005	86 90 93	90	90	90	89	::	90	86	86	93
Montenegro	MICS 2005-06	71	69	74	71	72	::	::	::	::	::
Serbia	MICS 2005-06	71	70	72	70	72	69	76	71	68	69

* The prevalence (P) with its 95% confidence interval (where available) is presented as 95%L P 95%U. See Louis TA, Zeger SL. Effective communication of standard errors and confidence intervals. *Biostatistics*, 2009, 10(1), 1-2.

** Preliminary survey results at the time of publication.

Note: Standard errors are not available for the prevalence of cardholders in all survey reports and thus confidence intervals are not provided here in some instances. The author encourages the reporting of standard errors for all estimates reported in DHS and MICS standard reports.

remain to redesign immunization or health cards in such a way to improve communication between all parties, closing gaps in communication between health care workers and parents, while also potentially streamlining workflow in health clinics or posts. Recent research in Pakistan has demonstrated the potential benefit on increased follow-up immunization visits (e.g., reduced drop-out) of redesigned, more mother-friendly immunization cards that incorporate a larger card size with bright colour and the strategic placement of reminder information in large text [12, 13]. In addition, more needs to be done through training and mentoring of health care workers to improve caregivers' understanding of the card and the benefits of retaining and bringing the immunization card to all child health care encounters [14]. As a child-centred, parent-controlled piece of information, immunization cards can improve the health consciousness of parents (and health providers) by providing basic information such as date, day of the week and location of the next vaccination visit as well as other health information and instructions thereby inherently promoting child health within the family and giving parents the potential to play a large role in protecting and promoting the public's health.

Finally, immunization cards support the collection of data for uses other than direct clinical care or delivery of vaccines such as for quality management and public health monitoring. Periodic coverage surveys, through which information is collected directly from a sample of households, are one way in which immunization coverage of young children is monitored. Within these surveys, immunization or child health cards available in the household are used to collect documented information on immunization services received by children. In the absence of an available or completed card, surveys often collect information based on maternal recall, though there is mixed evidence regarding the validity and reliability of recall relative to health records or immunization cards [15-20]. Despite the importance of cards to monitoring, the reliance on cards as a source of immunization data will almost certainly underestimate coverage until the proportion

of cardholders is more nearly equal the proportion of children immunized [21], further reinforcing the need to improve issuance, maintenance and utilization of cards.

Unfortunately, the prevalence of cardholders is surprisingly low in many countries. In 87 countries with readily available card prevalence data from Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Surveys (MICS) since 2000, the median prevalence of cardholders is 72% (min: 8%; max: 99; inter-quartile range: 59-82%) (Table 1) (N.B., all data are available at www.measuredhs.com and www.childinfo.org/mics.html). Cardholder prevalence was < 50% in 17 of the 87 countries (20%), 50-69% in 20 countries (23%), 70-79% in 25 countries (29%), 80-89% in 13 countries (15%) and >90% in 12 countries (14%) (based on the most recent survey result for the 87 countries). The prevalence of cardholders was < 70% in 21 of the 33 least developed countries (according to World Bank classification [22]) represented in the Table 1 (median: 62%; min: 8%; max: 93%; inter-quartile range: 48-74%). Differences in cardholder prevalence between boys and girls, urban and rural areas, and across wealth quintiles varied across countries. Whether the low prevalence of cardholders reflects problems related to issuance or to lost or misplaced cards is unclear. Recent anecdotal reports of national immunization programmes failing to procure and distribute cards may also be a factor contributing to low prevalences in some areas.

In summary, despite its potential to provide an adequate record of immunization history and its potential contribution to child health as a source of health monitoring data, the child immunization card is too often underutilized or inappropriately used by parents and health care workers and therefore does not always fulfil its intended purpose. National immunization programmes should be encouraged to procure cards as an essential piece of equipment in conjunction with other necessary vaccination supplies (e.g., auto-disable syringes, safe injection supplies). Moreover, these programmes should be encouraged to more actively promote the issuance and maintenance of the card (i.e., the card must be retained) with appropriate instructions for the

utilization of the card by parents and health care workers at each health care encounter and work to ensure accurate completion of the card by health care workers each time a child is immunized. The child immunization card is a relatively inexpensive intervention, and further research is needed to examine its potential role as a cost-effective means of improving immunization coverage. In addition, the global immunization community should begin to engage with the growing momentum of technology innovation and integration in public health to improve child immunization recording and monitoring of immunization status in the 21st century.

DISCLAIMER

The opinions expressed here are those of the author alone and do not necessarily reflect the positions of the United Nations Children's Fund.

ACKNOWLEDGEMENTS

The author is grateful to Drs Jos Vandelaer and Maritel Costales and Ms Stacy Young for their thoughtful comments on early versions of this manuscript.

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Received: October 14, 2011

Revised: January 03, 2012

Accepted: January 05, 2012

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