EUROPEAN ACADEMIC RESEARCH
Vol. IV, Issue 10/ January 2017

Impact Factor: 3.4546 (UIF)
DRJI Value: 5.9 (B+)

ISSN 2286-4822
www.euacademic.org

Paternal education level plays a vital role during the childhood measles vaccination

MD. ENAMUL HAQUE[1]
School of Public Health
Independent University, Dhaka, Bangladesh
B.M. RAJIB AHMED
Faculty of Science and Engineering
Department of Applied Statistics
East West University, Dhaka, Bangladesh
MD. SHOFIUL AZAM
Department of Food Engineering & Tea Technology
School of Applied Sciences and Technology
Shahjalal University of Science & Technology
Sylhet, Bangladesh

Abstract:

Reduction of childhood morbidity and mortality was the 4th goal of Millennium development Goal and routine measles vaccination coverage was one of the indicators of progress for the reduction of childhood mortality and morbidity. So the consideration for achieving this goal, funds were increased by national and international agencies and worked with national government. Furthermore, they had tried to find out more influential factors which will have strong significances for taking measles vaccination as well as for covering 100% measles vaccination. From that sense, paternal educational level was one of the factors which can played an important role for up taking measles vaccination among 9 to 59 months of child.

[1] Corresponding author: ehshamol@gmail.com

This study was conducted by secondary data which was taken from Bangladesh Demographic Health Survey (2011). Nationally, it worked as a representative data source. The survey was based on a two-stage stratified sample of households. This study's sample size was 6919 number of youngest children of the family. The data was collected from the different urban and rural part of the Bangladesh. Univaraite, bivariate and logistic regression analysis had applied for examining the frequency distribution among variables, association between dependent and independent variables measles vaccination coverage among 9 to 59 months of child. In this study, paternal education is statistically significant in case of up taking measles vaccination among 9 to 59 months children in Bangladesh at primary education; secondary education and higher education level. So the investigation showed that, paternal education level had influenced on measles vaccination uptake among 9 to 59 months of children from different level of their education in Bangladesh.

Key words: paternal education, childhood measles vaccination

1. BACKGROUND:

Measles is vaccine preventable and viral infectious disease and it is also highly contagious (7). It has case fertility rate up to 10%. 10 million cases and 64000 deaths were found occurred by measles in all around the world in 2008(4). 700 million children were vaccinated against measles those were in 9 months to 14 years aged in high risk countries within 2000 to 2008 (5). Among 2000 to 2008, measles deaths were desolated (potito howa) by 78% in all around the world. The South East Asia and Africa regions were belonging to the lowest rate which was 75% and 73% respectively (2). 76% measles vaccination covered in the low in-come countries among 12-23 aged children(5). 47 precedence (drototor) countries have identified by the World Health Organization and UNICEF as a highest burden of measles for rapid strategy for measles deaths reduction (13).Seven countries like India, China. Congo, Nigeria, Ethiopia

and Indonesia, 22.7 million children which was 2/3rds out of all children were not come to measles vaccination coverage within 2008. In fact, 70% India's children might have come to measles vaccination coverage but in 2008, 300 children have embraced (boron) death by the measles related disease in everyday. This scenario was saying that, though measles vaccination uptake rate is 70% but measles complications related death or mortality is high in India (6).

World Health Organization revealed that, measles is the top five leading causes for less than five child death in Bangladesh. Annually an estimated, 20000 children die as because of measles disease in the country (14). A study had conducted for BCG taking and measles coverage at Bhairab in Bangladesh which showed that, 90% girls were come to BCG coverage and among them, 70% were dropped for measles vaccination (3).BDHS 2011 report showed that the measles vaccination coverage is high which was 84.0% while other vaccine coverage is high like BCG- 97.8%, 1st dose of DPT/ Pentavalent,97.8%, 2nd dose,95.6%, 3rd dose,93.2% and 1st dose of polio, 97.8%, 2nd dose,95.8%,3rd dose, 93.2%. So in comparison to these vaccines measles vaccination coverage is still not satisfactory and as an indicator of MDG-4 our target is to reach 100% by 2015(9).

A study of Pakistan showed that, maternal education worked as influential factors in improving child nutritional outcomes but it was seen that father educational status was high influential factor to take health decision such as taking vaccination (1). A study conducted by Indian National Family and Health survey and it revealed that, literate father's children were vaccinated if even mother was illiterate (10). Data showed that a study conducted in Ohio, (United States) among 1003 children, aged 2, and it showed that paternal education status played a positive influence for receiving measles vaccination (8). However, this study tried to analysis

the paternal education's role on the measles vaccination uptake for the child aged less than 5 years.

2. HYPOTHESIS OF THE STUDY

Paternal education status influences infant's measles vaccination uptake.

3. OBJECTIVES OF THE STUDY:

This study had stand from the point of view of a general objective and two specific objectives.

3.1. General objective:

To investigate the significant influential determinants for child's measles vaccination uptake in Bangladesh.

3.2. Specific Objectives:

1. To examine the significances of paternal education level among 9 to 59 months child's measles vaccination uptake in Bangladesh.
2. To see the other influential factor that could be functional determinants among 9 to 59 months child's measles vaccination uptake in Bangladesh.

4. VARIABLES:

Nine independent variables had taken on the basis of one dependent variable.

4.1.A. Dependent variable:

► Measles vaccination uptake (Vaccine uptake or not uptake status during the childhood vaccination)

4.2. B. Independent variables:

Variables	Contains
1.Husband's/Partners/Paternal Educational Level	Husband's/Partners/Paternal education levels were contained a level category of education which was No, Primary, Secondary and Higher education.
2.Mothers Education Level	Mother education level was considered as the name of No, Primary, Secondary and Higher education.
3.Sex of the child	Sex of the child had considered as male and female group.
4.Wealth Index	Respondent's wealth status was presented by poorest, poorer, middle, richer and richest rank.
5.Type of Place of Residence	This variable considered as urban and rural area.
6.Region	Region as considered by seven administrative divisional area of Bangladesh like Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, Sylhet respectively.
7.Husband's/partners/paternal age	Husband /Partner/Paternal age was considered as three groups which was bellow 18 years age group,18 to 44 years age group, 45 and above years age group.
8.Birth order number	It contained 1st birth, 2 to 4th birth and 5th and above birth group.
9.Media Exposure	Respondents were exposed and not exposed on the media.

5. METHODOLOGY:

This study had been conducted by the following methodology likelihood found the data source and created data set according to the variables then selected sample size and data analysis used by analysis software as well as.

5.1. Sources of Data

BDHS data is a nationally representative data and the national entire population is covered by this data set. The survey used as a sampling frame the list of enumeration areas (EAs) prepared for the 2011 Population and Housing Census, provided by the Bangladesh Bureau of Statistics (BBS). A two stage stratified sample was used for data collection. 600 EA's were selected which was 207 in urban area and 393 in rural area for first stage. After that, a listing was carried out among in all selected EA's for making a sampling frame for the second stage. 18000 residential house holds were selected in this survey where 18000 ever married women (15-49) gave

interview. The survey was conducted in 18000 residential house where 6210 in urban area and 11790 in rural area. The sample was expected to result in about 18,072 completed interviews with ever-married women age 15-49, 6,426 in urban areas and 11,646 in rural areas.

5.2. Sample Size:

This study's sample size was 6919 number of children. Vaccination's information was taken for the last child of the respective respondents during the interview and each children age was between 9 months to 59 months.

5.3. Data analysis Procedure:

Statistical methods and software were used for examining the hypothesis. For analyzing the data, Univeriate, Bivariate and Logistic regression analysis were conducted for getting study results where SPSS 16 software was used. In this analysis, Firstly Univeriate analysis was done among independent and dependent variables. After that, Bivariate analysis was tested for examining the association among Dependent variable and independent variables. Lastly, Logistic regression analysis was used among variables those were significant at bivariate analysis. In this analysis, i tried to see the impact of paternal education level on measles vaccination uptake after controlling all other variables.

6. RESULTS:

Table 1 represents the frequency distribution analysis among all variables showed that, the levels of Husbands / Partners / paternal education (focal independent variable of this study) percentage scenario was that, Higher education level 12.1% which was very few rather than other education level. Here other education level's percentages were no education level 27.3%, primary education level 29.7% and secondary education

level 30.9%. On the on other hand, mother's higher education level (7.4%) was fewer than the husbands/partners/ paternal higher education level (12.1%) in this analysis. According to the analysis, mother's education level percentages were (no education, 18.3% which was less than the paternal/husband's/partner's education level, primary education 29.9% which was higher than the partner's/husband's/paternal education level, secondary education 43.6% which was higher than the husbands/paternal/partners education level. Moreover, in the case of measles vaccination uptake, 27.7% respondents didn't give measles vaccination to their children till now. So it was huge missing in terms of up taking measles vaccination among children yet. In the consideration of sex of the child number, male children's number was likelihood the higher than female children which was 51.6% and 48.4% respectively. In the case of wealth index of respondents, poorest respondents were belonged to the likelihood 21.3% percentage area which was higher number than the other respondents while poorer respondents were in 19.5%, middle respondents were in 19.4%, richer respondents were in 19.8%, richest respondents were in 20.0%. Among the respondents, they were residing more in rural area (68.7%) rather than urban area (31.3%). According to regional distribution for respondent's residing, this study found that, the percentage of Chittagong division was 19.6% which was higher percentage of respondents living region where Khulna division was belonging to lower stage of the percentage table which was 11.8%. On the other hand, other division's percentages were likely, Dhaka, Sylhet, Rangpur, Rajshahi, Barisal 17.2%, 14.0%, 12.9%,11.9% respectively. Moreover, partner's/paternal/husband's age group distributions, 66.2% husband's/partner's were belonged to 18-44 years age group where 33.7% husbands/partners belonged to bellow 18 years age group and .0% was in 45 and above years age group. Last analysis of final analysis, in the context of birth order number,

which was divided by First birth order number (33.6%) 2nd to 4th birth order number (57.0%) and 5th and above birth order number (9.3%) among respondent's children.Lastly,70.5% respondents was not exposed of media and only 29.5% was exposed on media.

Table 2 analyzed the bivariate analysis showed the association among measles vaccination uptake and all other independent variables. This analysis found the one insignificant independent variable out of all independent variables. Sex of the child were showed as insignificant variable in terms of p value which was p >0.05(.345). The P value of remaining 8 significant variables were, Husband's/partners/paternal education level(p-value=.000), Mother's education level(p-value=.000),Wealth index(p-value=.000),Type of place of residence(p-value=.001),Region(p value=.000), Husband / Partners / Paternal age (p-value=.047),Birth order number (p-value=.033) and media exposure (p-value=.000). In this analysis, whose fathers/partners/husbands had no education (69.4%), primary education (71.9%), secondary education (73.0%) and higher education (78.3 respectively those children were being measles vaccinated. On the other hand, whose mothers had no education (67.8%) primary education (71.2%), secondary education (73.5%) and higher education (81.1%) respectively those children's were being measles vaccinated. Moreover, 78.3% richest respondents had given measles vaccination to their children and likelihood the poorest 66.9%, poorer 72.2%, middle 72.3%, and richer 72.4% respectively. According to place of residence, 75.0% urban respondent's children were being vaccinated where 71.1 % rural respondent's children were being measles vaccinated. Among fathers age group, those fathers were belonged to 18 to 44 years age of group (73.4%), their children were being vaccinated than other age groups. In case of media exposure, those who had media exposed on measles vaccination uptake, 76.1% of them had given measles

vaccination and those who had no media exposed, 70.8% had given measles vaccination to their children.

Table 3 showed logistic regression analysis where husband's/partners/paternal no education level was used as reference group for husband's/partners/paternal education level variable. According to the same procedure, mother's no education level, middle rank of wealth index of respondents, urban area, 45 and above age year group, 2nd to 4th birth order number, not exposed of media used as reference group respectively. In this analysis, sex of the child variable had excluded because of its insignificant role with measles vaccination uptake what got from bivariate analysis. According to the logistic analysis, paternal/ husband's/partner's education level was statistically significant where secondary education and higher education level's p-value was .012, .000 and odd ratio was 1.192, 1.588 respectively. This result showed that, which father's had attained secondary and higher education levels those children was being 1.192 and 1.588 more times measles vaccinated rather than father's no education level. With the reference of Mother's no education, mother's primary education, secondary education and higher education was significant for up taking measles vaccination with paternal education. With the reference of middle rank of wealth index, poorest and richest respondents were strongly significant. In this analysis, poorest and richest rank's p-value were, .001 and .000 where those were belonged in poorest and richest rank of the wealth index their children were .756 and 1.478 respectively more times measles vaccinated than poorer and richer respondents. With the reference of urban area, rural area was significant where p- value was .000 and rural respondents had given measles vaccination to their children.800 times higher than urban area's respondents. Considering of Dhaka division as the reference of region variable, Barishal, Khulna, Rajshahi,Rangpur division were significant(P-value.014), (p-Value.048),(p-Value,.010),(p-value,.015) respectively. Rajshahi

Division's respondents had given measles vaccination to their children 1.299 times higher than Dhaka division's respondents where other divisions like Barisal division 1.295 times higher, Rangpur division 1.275 times higher, and Khulna division's respondents 1.225 times higher respectively had given measles vaccination to their children than Dhaka division's respondents. As the reference of 45 and above age year group ,whose Husband's/Partner's/Father's were belonged to within 18-44 age group those children were being measles vaccinated 1.117 times higher than 45 and above age group of respondents.

Birth order number with the reference of 2nd to 4th birth and sex of the child with the reference of female group of respondents were totally insignificant with the paternal education level for measles vaccination uptake. Media exposed was highly significant with paternal education level for measles vaccination uptake to their children where media exposed respondents were gave measles vaccination to their children 1.391 times higher rather than not exposed respondents.

7. DISCUSSION:

From this analysis, this study tried to show that, paternal education level is statistically significant where though primary education level is insignificant nevertheless, secondary and higher education level had showed robustly significant on children's measles vaccination uptake in Bangladesh. So in this consideration, if we see the above analysis, Univeriate analysis showed that, paternal secondary education level contained high percentage among other paternal education level including other confounders. These percentages gave us a scenario that, paternal education level must have played a role for up taking measles vaccination. On the other hand, Bivariate tests among measles vaccination uptake and paternal education level including all other variables gave us results that, Paternal

education level is belonged to <p=.005 which was .000*** controlled all other significant variables except sex of the child variable. Now if compare one study which was conducted by Anu Rammohon,Niyi Awofeso and Renae C.Fernandez(11) in Indonesia, Nigeria, India, Pakistan, Demographic Republic of Congo and Ethiopia where a child received measles vaccination increased with increasing levels of paternal education. This result was shown to be independent of maternal education levels. The positive correlation between paternal education levels and measles vaccination remained significant after controlling for a number of possible confounders. So from that result's comparison, this study analyzed socio demographic factors, mass media, maternal education and paternal educational level. After controlling all other factors when only paternal education level had increased then the likelihood measles vaccination up take had also increased. If compared a study which was conducted in Istanbul by SD, Torun, N. Bakirchi(12) (Vaccination coverage and reasons for no vaccination in a district of Istanbul. BMC Public Health2006,6:125–131.) found that the rate of non-vaccination was 2.3 times higher among children whose fathers had less than secondary education compared to those whose fathers had attained secondary education or higher. From this result, if compare among this study then we will see in logistic analysis that, who attained secondary and higher education level, they had 1.192 and 1,588 times respectively gave measles vaccination to their children rather than who did completed only primary education level. Though, we wanted to see, paternal education level influence on child's measles vaccination nevertheless, other variables are also can plays a significant role on that issue. So this study's result could be a nationally representative result where tried to explore that, paternal education level can cover the gap between measles vaccination up taking number and not up taking number. Though, this results have lot of implementation components in

the context of Bangladesh nevertheless, identified some major limitations in this research Firstly, I had bindings to create research design and faced obstacle about actual scenario of the field as because of this research was secondary data based research and that data was likelihood the 2011 data set which was old data. Secondly, strong unavailability of literature on this research topic. Thirdly, Variable chosen was another big limitation from data like variable cannot merge from several BDHS dataset as a result cannot take variables from several BDHS dataset as my wish. Fourthly, this result represents only for low income country like Bangladesh as because of data was collected from low income country. Fifth, Sample size was too small. Sixth, from the cultural context population not equally represent of urban and rural respondents.

Despite some major limitations of this research, nevertheless, study results contained importance for up taking measles vaccination. According to that sense, should have focused on lower-educated partners/husband/father for increasing measles vaccination. On the other hand, should be worked for awareness raising and increase health literacy on educated father. Moreover, should have increase the likelihood of adherence to vaccination schedules. Provide information about vaccine programs to the media exposed and not exposed populations in due time.

CONCLUSION:

Many children died in every year in Bangladesh for measles related complications till now. Measles related disease is the fifth leading cause of child's death in Bangladesh. So in this regard, for reducing child morality and morbidity must be coverage routine measles vaccination. Despite, a large number of children have taken measles vaccination in Bangladesh but a mentionable number is also not taken measles vaccination till now. So it is a major obstacle for achieving MDG4 goal

(reducing child mortality) in Bangladesh till now. In this study analysis, paternal education level plays a big role in the consideration of measles vaccination coverage. Measles vaccination takes some interval from other vaccination. In that interval, father education might be taken an important initiative for taking measles vaccination for their children. This initiative might be a big solution for reducing child mortality and could be cover the gap between measles uptake and not uptake numbers in Bangladesh.

ANALYSIS TABLES:

Table1: The frequency distribution among all variables

Variables	Frequency	Percent (%)
Husband's/Partners/Paternal Educational Level		
No Education	1891	27.3
Primary	2055	29.7
Secondary	2139	30.9
Higher	834	12.1
Mother's Educational Level		
No Education	1269	18.3
Primary	2121	29.9
Secondary	3017	43.6
Higher	512	7.4
Measles Vaccination Uptake		
Uptake	5005	72.3
Not Uptake	1914	27.7
Sex of the Child		
Male	3570	51.6
Female	3349	48.4
Wealth Index		
Poorest	1473	21.3
Poorer	1349	19.5
Middle	1344	19.4
Richer	1372	19.8
Richest	1381	20.0
Type of Place of Residence		
Urban	2167	31.3
Rural	4752	68.7
Region		
Barisal	820	11.9
Chittagong	1358	19.6
Dhaka	1191	17.2
Khulna	817	11.8
Rajshahi	873	12.6
Rangpur	891	12.9

Sylhet	969	14.0
Husband's/Partners/Paternal age		
Bellow 18 years age group	3	.0
18 to 44 years age group	4581	66.2
45 years and above	2335	33.7
Birth Order number		
First Birth	2328	33.6
2nd to 4th birth	3946	57.0
5th and above birth	645	9.3
Media Exposure		
Exposed	2442	29.5
Not Exposed	4877	70.5

Table2: A Bivariate analysis for examining the association between dependent variable and independent variables.

Independent Variables	Dependent Variable		P-Value
	Measles Vaccination Uptake (Percent)		
	Yes(%)	No(%)	
Husband's/Partners/Paternal Educational Level			.000
No Education	69.4	30.6	
Primary	71.9	28.1	
Secondary	73.0	27.0	
Higher	78.3	21.7	
Mother's Educational Level			
No Education	67.8	32.2	.000
Primary	71.2	28.8	
Secondary	73.5	26.5	
Higher	81.1	18.9	
Sex of the Child			
Male	72.8	27.2	.345
Female	71.8	28.2	
Wealth Index			
Poorest	66.9	31.1	.000
Poorer	72.2	27.8	
Middle	72.3	27.7	
Richer	72.4	27.6	
Richest	78.3	21.7	
Type of Place of Residence			
Urban	75.0	25.0	.001
Rural	71.1	28.9	
Region			
Barisal	76.7	23.3	.000
Chittagong	68.5	31.5	
Dhaka	71.8	28.2	
Khulna	74.4	25.6	
Rajshahi	75.5	24.5	
Rangpur	75.2	24.8	
Sylhet	67.5	32.5	
Husband's/Partners/Paternal age			
Bellow 18 years age group	33.3	66.7	.047
18 to 44 years age group	73.1	26.9	
45 years and above years age group	70.9	29.1	
Birth Order number			
First Birth	71.4	28.6	.033
2nd to 4th birth	73.4	26.6	
5th and above birth	69.0	31.0	
Media Exposure			.000
Exposed	76.1	23.9	
Not Exposed	70.8	29.2	

Table 3: Logistic regression coefficients for measles vaccination.

Variables	B(Constant)	S.E	E(B) /Odds ratio	p-value
Husband's/Partners/Paternal Educational Level (Ref. No Education)				
Primary	.118	.070	1.125	.093
Secondary	.175	.070	1.192	.012
Higher	.463	.098	1.588	.000
Constant	.820	.050	2.272	.000
Mother's Educational Level (Ref. No Education)				
Primary	.165	.077	1.179	.032
Secondary	.313	.073	1.368	.000
Higher	.934	.126	2.544	.000
Constant	.746	.060	2.108	.000
Wealth Index (Ref. Middle)				
Poorest	-.279	.082	.756	.001
Poorer	-.023	.086	.977	.787
Richer	.031	.085	1.032	.714
Richest	.391	.061	1.478	.000
Constant	.985	.061	2.677	.000
Type of Place of Residence (Ref. Urban)				
Rural	-.223	.059	.800	.000
Constant	1.154	.049	3.172	.000
Region (Ref. Dhaka)				
Barisal	.258	.105	1.295	.014
Chittagong	-.156	.087	.856	.073
Khulna	.203	.102	1.225	.048
Rajshahi	.261	.101	1.299	.010
Rangpur	.243	.100	1.275	.015
Sylhet	-.134	.094	.875	.152
Constant	.935	.064	2.548	.000
Husband's/Partners/Paternal age (Ref: 45 years and above years age group)				
Bellow 18 years age group	-1.583	1.226	.205	.197
18 to 44 years age group	.111	.056	1.117	.050
Constant	.889	.046	2.434	.000
Birth Order number (Ref. 2nd to 4th Birth)				
1st birth	.002	.063	1.002	.978
5th and above birth	.108	.067	1.114	.105
Constant	.967	.044	2.630	.000
Media Exposure (Ref: Not Exposed)				
Exposed	.330	.060	1.391	.000
Constant	.904	.031	2.469	.000

REFERENCES:

1. Aslam M, Kingdon G:Parental Education and Child Health–Understanding the Pathways of Impact in Pakistan. Research Consortium on Educational Outcomes and Poverty Working Paper2010, WP30/10.

2. Center for Disease Control and Prevention: 2011 Measles update. 2011, URL: http://wwwnc.cdc.gov/travel/content/in-the-news/measles.aspx,accessed on 3rd August, 2012.
3. Chowdhury, A.M.R., Bhuiya, A., Mahamud, S., Salam, A.K.M.A. and Karim, F. (2003).Immunization Divide: Who Do Get Vaccinated in Bangladesh. Journal of Health Population Nutrition, 21(3), 193-204
4. Dabbagh A, Gacic-Dobo M, Simons E: Global Measles Mortality, 2000–2008. MMWR 2009, 58:1321–1326.
5. Duclos P, Okwo-Bele JM, Gacic-Dobo M, Cherian T: Global immunization:status, progress, challenges and future. BMC International Health and Human Rights 2009, 9 (Suppl 1). doi:10.118 6/1472-698X-9-S1-S2.
6. Grais RF, Dubray C, Gerstl S, Guthmann JP, Djibo A: Unacceptably High Mortality Related to Measles Epidemics in Niger, Nigeria and Chad. PLoS Med 2007, 4(1):e16. doi:10.1371/journal.pmed.0040016.
7. https://en.wikipedia.org/wiki/Measles_virus**.**
8. Marks JS, Halpin TJ, Irvin JJ, Johnson DA, Keller JR: Risk factors associated with failure to receive vaccinations.Pediatrics1979,64:304–309.
9. National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2013. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh and Calverton, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.
10. Partha DE, Bhattacharya BN: Determinants of child immunization in four less-developed states of North India. J Child Health Care2002,6:34–50.
11. Rammohon.Anu, Awofeso. Niyi, Fernendez.C.Renae (paternal education status significantly influences infants' measles vaccination uptake independent of

maternal education status' BMC Public health 2012, 12:336,doi:10.1186/1471-2458-12-336.

12. SD,Torun, N.Bakirchi (Vaccination coverage and reasons for no vaccination in a district of Istanbul.BMC Public Health2006,6:125–131.)
13. World Health Organization, United Nations Children's Fund. Measles mortality reduction and regional elimination strategic plan 2001—2005, Geneva, Switzerland: World Health Organization; 2001).
14. World Health Organization. Global immunization vision and strategy 2006—2015, Geneva, Switzerland: World Health Organization; 2005).