Lim et al., *Cogent Medicine* (2016), 3: 1142410
http://dx.doi.org/10.1080/2331205X.2016.1142410

cogent medicine

PEDIATRICS | SHORT COMMUNICATION

Exploring immunisation refusal by parents in the Malaysian context

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Received: 19 October 2015
Accepted: 12 January 2016
First Published: 20 January 2016

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Reviewing editor:
Albert Lee, The Chinese University of Hong Kong, Hong Kong

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Abstract: *Objective:* To investigate parental reasons for reluctance towards immunising their child. *Methodology:* Ten government health centres providing primary immunisation were selected via non-proportionate stratified random sampling. Children aged 15–24 months who defaulted immunisation for 3 months or longer were identified. Data were obtained from clinic records and a structured telephone interview of parents. Parents were categorised as immunisation refusals or immunisation defaulters. *Results:* Of 10,189 immunisable children, 95 missed primary immunisation. Contact was established with 52 and 44 completed telephone interviews. Of these, 8 (18.2%) refused immunisation, while 31 (70.5%) defaulted immunisation. The immunisation refusal and defaulter rates per 10,000 children immunised per year were 8 and 30, respectively. The main reason for refusing immunisation was a preference for alternative treatment 6 (75.0). *Conclusion:* This first systematic evaluation of immunisation refusal in Malaysia showed that a small number of parents refused immunisation.

Subjects: Health and Social Care; Pediatrics & Child Health; Public Health Policy and Practice

Keywords: child; immunisation; parents; refusal

1. Introduction

Immunisation is a significant public health achievement, which has greatly reduced the burden of vaccine-preventable diseases (Andre et al., 2008; Omer, Salmon, Orenstein, deHart, & Halsey, 2009).

ABOUT THE AUTHOR

This study was conducted as a joint initiative between the Clinical Research Center and a regional Paediatric Department in the administrative area of Perak, Malaysia. The focus of the team was to use Health System Research to evaluate important community issues impacting health care and health delivery.

PUBLIC INTEREST STATEMENT

What is known about this topic:
Vaccination has reduced the burden of infectious diseases. Achievement of the Millennium Development Goal 4 (two-thirds reduction in under-5 child mortality by 2015) will be greatly advanced by expanded and timely access to key life-saving immunisations. However, there is a growing trend internationally for immunisation refusal by parents.
What this study adds:
Study findings suggest that parents were concerned with vaccine contents and assumed that vaccines do not have their purported effects. This leads to parental refusals, without realising the consequence of not vaccinating their children is far more serious. This perception could endanger their children and lead to epidemics affecting other children.

It is estimated that vaccines prevent almost 6 million deaths annually worldwide (Ehreth, 2003). Vaccines also mitigate diseases' severity and protect the unvaccinated population through "herd immunity" (John & Samuel, 2000). Concerns with adverse events with vaccines and the purported association between vaccines and autism have led to an increasing number of parents refusing vaccination for their children (World Health Organization, 2014).

In Malaysia, there have been an increasing number of parents having concerns about immunising their child with some refusing vaccines. This study investigated the immunisation refusal rate and parental reasons for reluctance towards immunising their child in an administrative region in Malaysia.

2. Methodology

2.1. Study setting and sampling

A cross-sectional study was conducted in November 2013 to explore the reasons for parental reluctance to immunise their child. The study methodological flow chart is shown in Figure 1. All Ministry of Health (MOH) government health centres in the Kinta administrative region providing immunisation to children were identified and stratified into three groups according to the type of health centre (13 health clinics, 4 mother and child health clinics and 12 rural clinics). Ten health centres were selected via non-proportionate stratified random sampling.

It was estimated from clinic visit records that these health centres would provide a sample in excess of 10,000 children receiving primary immunisation. Clinic records of children aged 15–24 months with a history of missing any immunisation were reviewed for study inclusion. A missed immunisation was defined as a child aged 15–24 months who had not received any of the primary immunisation vaccines, given in the first year of life, for more than 3 months from the scheduled immunisation date. Children who were admitted to hospitals where they received a modified immunisation schedule or had contraindications to vaccine(s) were excluded. Children who completed their immunisation according to the MOH schedule in other government or private centres were also excluded.

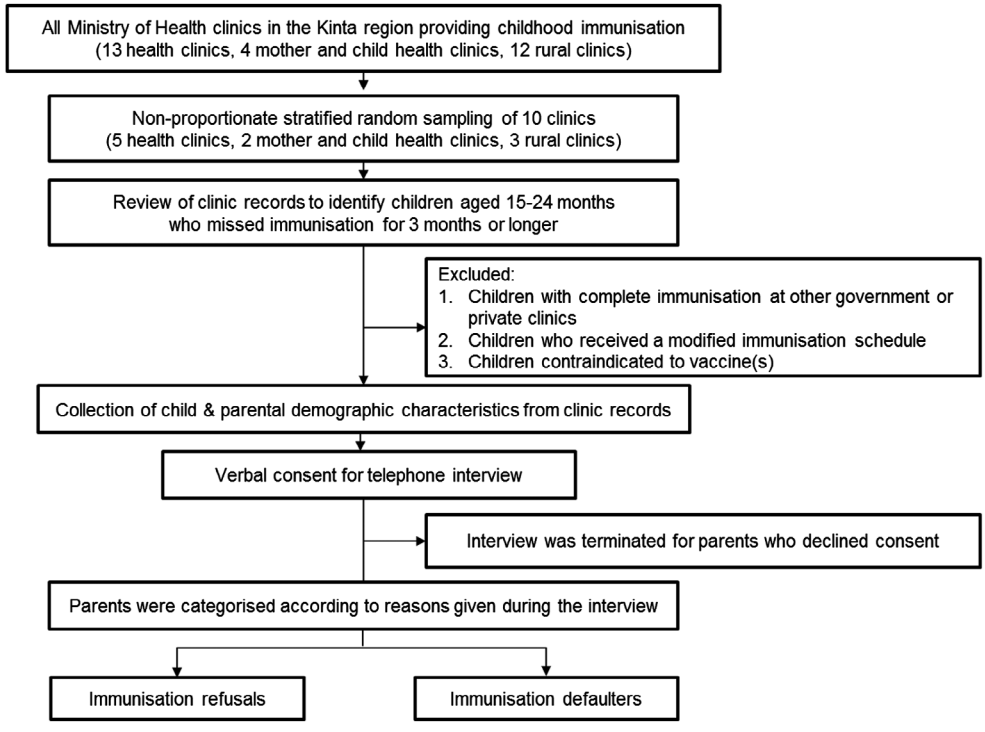

Figure 1. Methodology flow chart.

2.2. Data acquisition

Parents who fulfilled study criteria were interviewed via telephone to determine the reasons for defaulting or refusing immunisation of their child. Verbal consent was obtained prior to the interview. To minimise response bias, the respondents of the telephone interview were restricted to the child's parents or grandparents. The interview questionnaire was developed in two languages (Bahasa Malaysia and English) using a literature review, local expertise and targeted at meeting research objectives. The questionnaire was pretested on five parents for each language version for clarification of content and these were not included into the sample. The pretested interview questionnaire was revised prior to conducting the study.

Child and parental demographic characteristics were obtained from clinic records and completed, if necessary, from the telephone interview. Depending on the interview, parents were categorised into two groups: (a) immunisation refusal and (b) immunisation defaulters (non-refusals or missed appointments). Immunisation refusal was defined as a parent who had refused some or all vaccines for their child in the first year of life. Immunisation defaulter was defined as a parent who had missed some or all vaccines for their child in the first year of life, but was still planning to complete immunisation. Refusal and defaulter rates were determined, and calculated for an annual time period.

2.3. Ethical considerations

This study attained approval from the Medical Research Ethics Committee (MREC) of MOH Malaysia (NMRR-13-979-17774). Institutional approval was obtained from the Perak State Health Director. Participation in the study was voluntary. All data collected and responses obtained from the telephone interview were kept strictly confidential, and no unique identifiable information was collected. Participants did not receive any form of remuneration for participation in this study.

3. Results

3.1. Sample recruitment and response rate

In the 10 selected health centres, there were 10,189 children registered. Ninety-five children missed primary immunisation for 3 months or longer. Telephone contact was attempted with parents. Forty-three parents' phone numbers were not contactable after multiple attempts. Contact with 52 parents was established, but 8 declined to participate. Out of 44 parents, 8 (18.2%) chose to refuse and 31 (70.5%) defaulted immunisation. Another five (11.4%) reported that their child had transferred to another health care facility for follow-up and had completed immunisation. A flow chart of sample recruitment and response rate is shown in Figure 2.

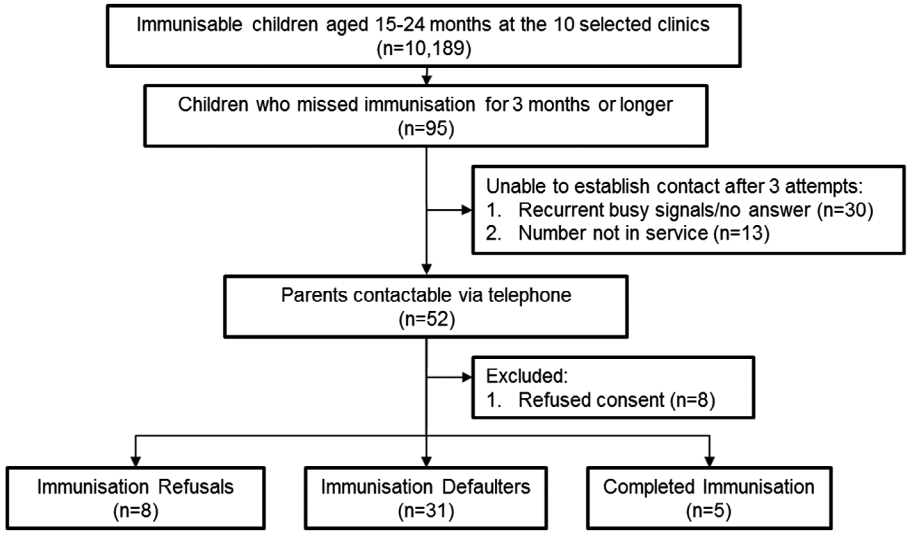

Figure 2. Flow chart for sample recruitment and response rate.

Table 1. Characteristics and immunisation profile by parental refusal and defaulter group

	Refusal (*n* = 8)	Defaulter (*n* = 31)	Total (*n* = 39)
Respondent demographics			
Respondent, *n* (%)			
Father	1 (12.5)	3 (10.0)	4 (10.3)
Mother	7 (87.5)	28 (90.0)	35 (89.7)
Age of respondent in years, mean (SD)	31.8 (5.5)	31.1 (6.1)	31.2 (5.9)
Education level of respondent, *n* (%)			
Primary	0 (0.0)	1 (3.2)	1 (2.6)
Secondary	8 (100.0)	16 (51.6)	24 (61.5)
Tertiary	0 (0.0)	14 (45.2)	14 (35.9)
Occupation of respondent, *n* (%)[a]			
A (high managerial, administrative or professional)	0 (0.0)	1 (3.2)	1 (2.6)
B (intermediate managerial, administrative or professional)	0 (0.0)	2 (6.5)	2 (5.1)
C1 and C2 (supervisory and skilled manual)	3 (37.5)	15 (48.4)	18 (46.2)
D (semi- and unskilled manual workers)	2 (25.0)	1 (3.2)	3 (7.7)
E (pensioners, casual/lowest grade, unemployed with benefits)	3 (37.5)	12 (38.7)	15 (38.5)
Child demographics			
Age of child in months, mean (SD)	18.5 (4.4)	19.0 (3.3)	18.9 (3.5)
Gender of child, *n* (%)			
Male	4 (50.0)	16 (51.6)	20 (51.3)
Female	4 (50.0)	15 (48.4)	19 (48.7)
Ethnicity of child, *n* (%)			
Malay	8 (100.0)	23 (74.2)	31 (79.5)
Chinese	0 (0.0)	4 (12.9)	4 (10.3)
Indian	0 (0.0)	4 (12.9)	4 (10.3)
Number of children alive in household, *n* (%)			
1	1 (12.5)	0 (0.0)	1 (2.6)
2–4	2 (25.0)	23 (74.2)	25 (64.1)
≥5	5 (62.5)	8 (25.8)	13 (33.3)
Immunisation profile			
Number of vaccines missed, *n* (%)			
1	1 (12.5)	19 (61.3)	20 (51.3)
2–5	4 (50.0)	12 (38.7)	16 (41.0)
>5	3 (37.5)	0 (0.0)	3(6.1)
Types of vaccines missed, *n* (%)			
BCG	1 (12.5)	0 (0.0)	1 (2.6)
HepB first dose	1 (12.5)	0 (0.0)	1 (2.6)
HepB second dose	3 (37.2)	0 (0.0)	3 (7.7)
HepB third dose	6 (75.0)	13 (41.9)	19 (48.7)
DTaP/IPV/Hib first dose	4 (50.0)	2 (6.5)	6 (15.4)

(*Continued*)

Table 1. (*Continued*)

	Refusal (*n* = 8)	Defaulter (*n* = 31)	Total (*n* = 39)
DTaP/IPV/Hib second dose	4 (50.0)	8 (25.8)	12 (30.8)
DTaP/IPV/Hib third dose	6 (75.0)	11 (35.5)	17 (43.6)
Measles	1 (12.5)	0 (0.0)	1 (2.6)
MMR	7 (87.5)	30 (96.8)	37 (94.9)
Contraindication to vaccine(s), *n* (%)	0 (0.0)	0 (0.0)	0 (0.0)
Follow-up initiatives by clinic staff, *n* (%)			
Yes	6 (75.0)	9 (29.0)	15 (38.5)
No	2 (25.0)	22 (71.0)	24 (61.5)

Notes: SD = standard deviation; BCG = Bacillus Calmette–Guérin vaccine; HepB = Hepatitis B vaccine; DTaP = diphtheria–tetanus–pertussis vaccine; IPV = inactivated poliovirus vaccine; and Hib = Haemophilus influenzae type B vaccine; MMR = measles, mumps and rubella vaccine.

[a]Social grading derived from the British National Readership Survey (NRS) 2008.14.

3.2. Demographics and immunisation profiles

The demographic characteristics and child's immunisation profile of parents who refused and defaulted their child's immunisation are summarised in Table 1. All parents who refused immunisation for their child were of Malay ethnicity, with secondary-level education. None of the parents were of social classes A and B, majority were of social classes C1 and C2 and E. Parents who refused immunisation had more children in the household, and missed a higher number of vaccines compared to parents who defaulted immunisation. Children of refusal parents missed immunisation appointments at a younger age compared to children of defaulter parents. The three most commonly missed vaccines in both groups are MMR, third dose of HepB and third dose of DTaP/IPV/Hib. However, none in the defaulter group missed the BCG vaccine and the first two doses of the HepB vaccine. Clinic staff made more contact attempts to reschedule missed immunisation appointments with parents of the refusal group compared to the defaulter group (75.0% vs. 29.0%).

3.3. Immunisation refusal and defaulter rates

In this study, the immunisation refusal rate was 8 per 10,000 children per year and the immunisation defaulter rate was 30 per 10,000 children per year.

3.4. Reasons for refusing immunisation

Table 2 shows reasons for refusing immunisation. Six (75.0%) parents believed in alternative treatment and considered homeopathy rather than conventional immunisation due to perceived less side effects. Three (37.5%) parents assumed vaccines are not effective and two (25.0%) expressed doubts about the vaccine(s) contents. Other reasons cited were inadequate information from health

Table 2. Parental reasons for refusing immunisation[a]

	n (%)
Alternative treatment (homoeopathy)	6 (75.0)
Assume vaccines have no effect	3 (37.5)
Doubtful of the vaccine contents	2 (25.0)
Did not receive information about vaccine/immunisation from doctor/nurse	1 (12.5)
Information from family members	1 (12.5)
Information from TV, radio, newspaper, etc.	1 (12.5)
Religious influence	1 (12.5)
Personal belief	1 (12.5)
Long waiting time at the clinic	1 (12.5)

[a]Respondents may provide more than one reason.

Table 3 Parental reasons for defaulting immunisation[a]

	***n* (%)**
Busy with work	10 (32.3)
Long waiting time at the clinic	7 (22.6)
Child not well	7 (22.6)
Forgot the immunisation date	5 (16.1)
No transportation	4 (12.9)
Unhappy with the service provided at the clinic	3 (9.7)
Did not receive information about vaccine/immunisation from doctor/nurse	2 (6.5)
Others (e.g. overseas, etc.)	5 (16.1)

[a]Respondents may provide more than one reason.

care providers, social media and family influence, long waiting time at the clinic and religious and personal beliefs, one (12.5%), respectively.

3.5. Reasons for defaulting immunisation

The reasons for defaulting immunisation are listed in Table 3. Ten (32.3%) parents claimed to be busy with work, 7 (22.6%) complained long waiting time at the clinic, 7 (22.6%) claimed that their child was not well, 5 (16.1%) forgot their child's appointment and 4 (12.9%) did not have transportation. Other reasons cited were unsatisfactory services at the clinic 3 (9.7%), and inadequate information about immunisation from health care providers 2 (6.5%).

4. Discussion

4.1. Principal findings

The immunisation refusal and defaulter rates per 10,000 children immunised per year were 8 and 30, respectively. The three most commonly missed vaccines were same for both groups, which was MMR, followed by the third dose of HepB and third dose of DTaP/IPV/Hib. Seven (87.5%) children from the refusal group missed two or more vaccines while 19 (61.3%) from the defaulter group missed one vaccine.

The three main reasons for refusing vaccines were a preference for alternative treatment, six (75%), assumption that vaccines have no effect, three (37.5%), and doubt regarding vaccine contents two (25%). The three main reasons for defaulting vaccines were busy with work, 10 (32.3%), long waiting time at the clinic, 7 (22.6%), and child not well, 7 (22.6%).

4.2. Strengths and limitations

This study calculated an annual immunisation refusal and defaulter rates. It identified the accompanying reasons for refusal and defaulting immunisation. This study was conducted via telephone interview with parents, which has enabled rapid direct contact with respondents, and accessed a number of respondents within a short data collection period.

However, telephone interview limited study findings to parents with functioning telephones. The immunisation beliefs and intentions of parents without working telephones may differ from those we report. Admitting to refusal or default may be subjected to interviewer bias over the phone. As the study was conducted in an urban setting, we cannot determine if immunisation refusals are more or less prevalent in rural areas of the region. The study was conducted in government clinics, which deliver 80% of immunisation in the country. Some parents who refuse immunisation may be seen in the private sector or not register with any health provider. Thus, the actual immunisation refusal rate might be higher. The small rate of immunisation refusal identified in this study, together with limited respondents, impairs generalisability and the clear determination of the profile of

parents likely to refuse immunisation for their child. However, the current study can be viewed as the basis for future studies on this issue.

4.3. Comparisons with other studies

To date, there are no published local studies regarding immunisation refusal rates or reasons for parental reluctance towards immunising their child. An unpublished local study conducted in a University Hospital setting in 2009 investigated parental knowledge, barriers and beliefs towards childhood immunisation, but did not evaluate the reasons for refusal (Bahari & Pubalan, 2014).

Fredrickson, Davis, and Bocchini (2001) reported the most commonly expressed reason for parental refusal of vaccines was side effects. Less common reasons reported were religious or beliefs that the disease was not harmful. These reasons were similar with the reasons reported by parents in our study.

The 2003–2004 National Immunisation Survey in the USA states the main reason parents changed their minds about delaying or refusing a vaccine was due to doubtful information or assurances from health care providers (US Department of Health & Human Services, 2000). In our study, some parents reported missing vaccination due to inadequate information about immunisation provided to them by health care providers.

4.4. Unanswered questions and future research

In our study, parents were interviewed via telephone to determine reasons for refusing immunisation for their child. Future research could utilise a focused-group discussion approach involving health care providers to actively engage parents and explore vaccination knowledge, attitudes and practices among parents who refused immunisation for their child. In addition, future studies could look at interventions aimed at improving vaccine uptake among children. Educational and outreach programmes that emphasise the importance and health benefits of childhood vaccination should be evaluated.

4.5. Implications for Clinicians and Policy-Makers

Findings from our study indicated that some parents were concerned with vaccines' side effects, contents of the vaccine(s) and assumed that vaccines do not have their purported effects. These concerns have led to parental refusal of immunisation without realising that the consequence of not vaccinating their children could be more serious. In addition, some parents are turning towards alternative treatment such as homeopathy based on personal, religious beliefs and information obtained from the media and family members. This perception could endanger their child and other children. Clinicians and policy-makers need to be aware of refusal rates, the reasons for them, as well as parents' perspectives that might influence refusal decisions. Periodic national childhood immunisation surveys should be conducted to monitor childhood immunisation refusal rates.

5. Conclusion

This first systematic evaluation of immunisation refusal in Malaysia showed that a small number of parents refused immunisation.

Acknowledgements
We thank the Director General of Health Malaysia for giving permission to publish this paper. We also thank respondents for their cooperation in the telephone interview, and medical staff of MOH health centres in the Kinta region for their support.

Funding
This study was supported by routine operational funds of Clinical Research Centre Perak. This study received no specific grant from any funding agency in public, commercial or not-for-profit sectors.

Competing interests
The views, interpretations, implications, conclusions and recommendations expressed in this paper are those of the authors alone and do not necessarily represent the opinions, views and policy of the Ministry of Health Malaysia.

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Citation information
Cite this article as: Exploring immunisation refusal by parents in the Malaysian context, W.Y. Lim, H.S.S. Amar-Singh, Netia Jeganathan, H. Rahmat, N.A. Mustafa, Fatimah-Sham Mohd Yusof, R. Rahman, S. Itam, C.H. Chan & M.S. N-Julia, *Cogent Medicine* (2016), 3: 1142410.

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***Cogent Medicine* (ISSN: 2331-205X) is published by Cogent OA, part of Taylor & Francis Group.**