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Title: Seasonal influenza vaccination for children with special risk medical conditions: does policy meet practice?

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Conflict of Interest

JT and NC report no conflict. HM is an investigator on clinical trials of investigational vaccines sponsored by Industry. Her institution receives funding from Industry (GSK, Pfizer, Novavax) for Investigator led research. She does not receive any personal payments from Industry.

What is already known on this topic

- Influenza vaccination rates in children at increased risk are sub-optimal.
- A medical professional recommendation greatly influences vaccine receipt.

- General practitioners (GP) and paediatric specialists play a crucial role in the knowledge exchange concerning influenza vaccination for children with special risk medical conditions (SRMC).

What this adds:

- The number of GPs and paediatric specialists providing a recommendation for the influenza vaccine to parents of children with SRMC is modest.
- A sense of responsibility, knowledge and confidence of determining 'at risk' conditions are key drivers towards providing a recommendation.
- Medical professionals caring for children with SRMC require education to address a knowledge gap and access to concise information about what constitutes a SRMC.

Abstract

Objective: Ensuring children with special risk medical conditions (SRMC) are protected from influenza is important. The study objective was to describe influenza vaccination practices of medical professionals caring for children with SRMC and explore characteristics associated with a vaccine recommendation.

Design: Cross-sectional survey.

Setting/participants: Treating paediatric specialists and general practitioners of children with confirmed SRMCs.

Methods: Postal questionnaire administered from March-September 2018 (option for online response). Characteristics associated with providing a recommendation were explored using univariable and multivariable analyses.

Results: Overall response rate of 24.8%, with the sample representative of the eligible population in terms of practice location and years practicing medicine. There was a higher response from females and sub-specialists. Of the 198 completed survey responders, 97.8% were aware of the recommendation, yet only 38.4% reported they 'always' routinely recommended influenza vaccine and fewer (19.5%) were very confident in understanding all 'medically at risk' conditions. Medical professionals were more likely to provide a recommendation always or mostly, if they received annual influenza vaccination themselves (aOR 3.96, CI 1.12-14.03), had confidence in understanding all 'medically at risk' conditions (aOR 1.82, CI 1.04-3.17) and perceived ownership of the responsibility to provide the recommendation (aOR 7.35, CI 1.67-32.26). Regional practising medical professionals were less likely to provide a recommendation (aOR 0.25 CI 0.10-0.70).

Conclusions: We need to improve medical professionals' knowledge through reminders and access to consistent and concise information about what constitutes a SRMC. Increasing medical professionals' engagement in the influenza vaccination program could also provide a sense of responsibility fostering provider endorsement.

Keywords: Immunisation, Infectious Diseases, Influenza

Introduction

Indisputably, vaccination is one of the most important preventive measures, contributing globally to a decrease in the spread of serious infectious diseases and death. [1] General practitioners (GPs) play a major role in the Australian immunisation landscape: 11% of children's (<15 years) GP encounters are for immunisation, second only to acute respiratory infections (16%). In Australia, the majority of children's vaccinations are administered in general practice.[2, 3] While 82.9% of children have at least one appointment with a GP annually [3], for children also under the care of a paediatric specialist, delineating who should provide preventive health care can be challenging, depending on healthcare provider knowledge, practical limitations and parental preference.

Influenza is a serious respiratory disease, with the potential for significant complications including death; children are particularly vulnerable. [4] The 2019 influenza season started early with high notification rates, an unpreceded number of influenza-related hospitalisations and several deaths in young children.[5] Despite a funded recommendation for all individuals aged ≥6 months with a special risk medical condition (SRMC) to receive the influenza vaccine, coverage in Australian children with SRMC remains sub-optimal. [6-9]

The constant, key influence to vaccination in SRMC children is a recommendation from a medical professional, [7, 10] considered most influential when delivered by the child's paediatric specialist. [7-9]However, data on the delivery practices and attitudes towards influenza vaccination in the context of Australian GPs and paediatric specialists who care for these children is scarce and there is likely to be a significant policy-practice gap.

The aim of this study was to describe, in a group of medical professionals caring for children with SRMCs, the frequency of influenza vaccine recommendation and explore characteristics associated with that recommendation. Additionally, we aimed to establish provider responsibility, medical professionals' confidence in understanding the conditions 'medically at risk' and their beliefs regarding influenza vaccination.

Methods

Study design

Observational cross-sectional study design consistent with STROBE recommendations.[11]

Study recruitment

Purposive sampling was used to select participants, enabling a homogenous sample of medical professionals actively involved in the care of children with SRMC from both tertiary and primary care settings. Medical professionals were identified as the children's treating paediatric specialists and GPs by the parents of children with confirmed SRMCs. The children were recruited as part of a separate cross-sectional study examining influenza vaccine coverage in children with SRMCs. Parents or guardians of children with SRMC attending outpatient clinics or inpatients at the Women's and Children's Hospital (WCH) were recruited using convenience sampling. Paediatric specialists worked either privately or at the WCH, the major provider of tertiary paediatric healthcare services in South Australia. We identified the child's current nominated GP, specified either by name or medical practice. The WCH has a specialist immunisation service including a dedicated immunisation nurse and more recently an immunisation clinic (established in 2015).

Medical professional survey design

The postal survey (31 questions) was administered from March to September 2018. The survey collected data on demographics, experience, individual influenza vaccination behaviour and knowledge of influenza disease. Questions related to influenza vaccine attitudes, understanding of the official recommendations and practice. Additional questions asked participants to elaborate on barriers to recommending the vaccine and future educational resources. A personalised invitation letter was mailed to participants along with the questionnaire and reply-paid envelope. There was an option to complete the questionnaire online, accessible through a web-link which was provided. A second mail-out was posted six weeks after the first, with a third and final contact made via email to all specialists with an email address and all GPs for whom we were able to contact via their medical practice email address.

Statistical analysis

We estimated that a sample size of 217 participants would allow us to determine the proportion of medical professionals providing an influenza vaccine recommendation to children with SRMC and to determine characteristics associated with vaccine recommendation with a ± 5% precision at a 95% confidence level. Respondent attitudes to possible barriers to recommending the vaccine were assessed with a 5-point Likert scale from "strongly agree" to "strongly disagree", with agreement representing a positive belief. Negatively worded items were reworded and reverse scored. As appropriate, Likert scale responses were dichotomized based on distribution of responses.

Data were analysed using descriptive and inferential statistics; responses from open-ended questions were coded with content analysis. Concepts contributing to provider recommendation were investigated. Characteristics associated with routinely recommending the influenza vaccine always or mostly were explored using multivariable regression. Odds ratios (OR) and adjusted OR (aOR) were presented with 95% confidence intervals (CI). Stata (Version 14.1) was used for all statistical analyses (StataCorp, Texas, USA). The study was approved by the Women's and Children's Health Network Human Research Ethics Committee.

Results

Study population

In total, 215 surveys were returned (Figure 1). These returned surveys were the medical professionals of more than half of our total cohort of children with SRMC (n=410) in our original study. The response rate was highest for specialists 27/48 (56%), with a lower rate from GPs 188/820 (21.3%), providing an overall response rate of 24.8%. A total of 198 surveys were completed, 18.2% (n=38) online and 80.8% (n=160) hard copy. As no differences between groups on any variables were identified, data were combined.

Description of study sample

Participant characteristics are summarised in Table 1. While the sample was representative of the eligible population in terms of practice location and years practicing medicine, there was a higher response from females, and sub-specialists. In all those with complete data (n=198), there were

equal proportions of males and females. Of paediatricians with complete data (n=23), 10 were general paediatricians and 13 were subspecialist paediatricians.

Medical professionals' vaccination, knowledge and perceptions of influenza disease

Overall 97.5% of medical professionals had previously received the influenza vaccine, with 90.9% reporting annual receipt (GPs 89%; specialists 100%, n=23). The most influential driver to ever receiving the vaccine was self-protection (67%), followed by protecting patients (23%) and increased risk as a health care professional (16%). Most medical professionals (90.9%) agreed/strongly agreed that HCWs in a hospital should be obliged to be vaccinated against influenza. Only 39.9% strongly agreed that influenza is serious compared to 84.3% who strongly agreed that influenza is serious for children with SRMC ($p<0.0001$).

There was high awareness (98%) that children aged >6 months with SRMCs are recommended to receive the influenza vaccine (Table 2). Fewer medical professionals indicated (19.2%) they were very confident in understanding all the conditions considered 'medically at risk', with 28.3% being only somewhat confident or lower. Medical professionals expressed a need for concise information to define the qualifying medical conditions, with options for online formats to be available (Table 3).

Medical professionals' views

There was a high level of confidence in influenza vaccine: 97.9% and 91.4% of medical professionals, agreeed/strongly agreeedng it was both safe and effective, respectively. While only 68.9% regarded the wording of the recommendations for the 'at risk' medical conditions as well defined, there was only moderate support for a universal recommendation for all children (62.9%). Overall a higher proportion of medical professionals (n=194) perceived providing a recommendation to be the responsibility of a GP compared to the responsibility of a specialist (92.8% versus 84.5%). Medical professionals were divided on whether an incentive payment should be provided for vaccinating children with SRMCs, with 25.8% opposed, 32.8% in favour of a payment and 41.1% reporting no view.

Influenza immunisation practices

Whilst 84.9% of medical professionals reported discussing influenza disease with parents, the remainder reported only sometimes (13.6%) or never (1.5%) having such discussions (Table 2). Only 38.4% reported 'always' providing a recommendation for the influenza vaccine. Participants' level of confidence in understanding the 'at risk' conditions was associated with providing a vaccine recommendation to parents and only 66.2% reported prioritising influenza vaccination (Table 4). In total, only 37.4% of medical professionalss reported having a recall or reminder system for children with SRMC, with an additional 13.7% unsure.

Characteristics associated with routinely recommending the influenza vaccine

In the adjusted model (Table 5), medical professionals were more likely to provide a recommendation always or mostly if they received the vaccine themselves yearly (aOR 3.96, CI 1.12-14.03), had confidence in understanding all qualifying 'medically at risk' conditions (aOR 1.82, CI 1.04-3.17) and perceived ownership towards providing a recommendation (aOR 7.35, CI 1.67-32.26). Those practising in a regional location were less likely to provide a recommendation (aOR 0.25 CI 0.10-0.70).

Discussion

This study found that although GPs and paediatric specialists perceive influenza to be a serious infection in children with SRMC, a considerable sub-group do not recommend the influenza vaccine regularly to these children. Medical professionals indicate only moderate confidence in understanding the conditions 'medically at risk' and in endorsing the current 'at risk' groups as being well defined. Additionally, it remains unclear to GPs and specialists who owns responsibility for providing the recommendation.

Characteristics associated with providing the recommendation were a sense of responsibility, practicing medicine in a metropolitan area and receiving the vaccine annually themselves. From the crude to adjusted model, the effect of 'sense of responsibility' attenuated slightly with the influence of other variables, whilst the positive effect for practicing medicine in a metropolitan area remained relatively consistent. The reason for the difference between practicing locations is unclear. Regional GPs may require greater influenza resources, but it may also suggest that children with SRMC living

in regional areas who are under the care of a sub-specialist may be less engaged with local primary health care providers, so the requirement for providing a recommendation is not as clear. Previous research identifies differences in regional areas, with fewer GPs discussing non-funded immunisations and parents not as aware of current children's influenza recommendations. [38]

In the multivariable model, understanding all the conditions considered 'medically at risk' was associated with providing a recommendation. This may suggest medical pofessionals' knowledge and confidence of 'at risk' conditions could be key drivers towards providing a recommendation. Previous studies also indicate that in addition to a lack of confidence towards general vaccine related knowledge and strong support for more vaccine education, paediatricians want more education and clearer influenza vaccine recommendations. [12, 13] In addition to provider education, serious consideration is also required regarding what type of structural remedies could result in high uptake. Hospital changes could promote and normalise vaccination as part of SRMC care and help to ensure specialists provide recommendations to parents. Discussion of influenza vaccination in patient groups during hospital staff meetings or the establishment of registers of children with SMRC and use of messaging software, currently used for appointment reminders, could assist in improving uptake. Alternatively, structural remedies at the practice level incorporating the use of electronic medical record (EMR) systems that continue to prompt at each visit and encourage an ongoing conversation have demonstrated effectiveness. [14, 15]. Nationally, increasing the capability of the Australian Immunisation Register to capture risk status could provide another mechanism for recommendations to reach parents and help establish accurate coverage information for this priority target group, which is missing on a large scale globally. [16]

This study identifies that detailed awareness of the recommendation is an important knowledge gap, which may result in hesitancy to recommend the vaccine. Regardless of risk status, the vaccine is recommended for all people >6 months who would like to be protected against influenza.[17] If medical professionals have difficulty in determining whether a child identifies at risk according to NHMRC recommendations, it is unlikely that the vast majority of parents would make this distinction individually without medical guidance.

In Australia, the influenza vaccine is currently only funded under the NIP for those in specific recognised risk groups > 6 months of age, all Aboriginal and Torres Strait Islander persons, those with medical conditions, the elderly and pregnant women eligible (Figure 2). Since 2018, all Australian states have funded universal influenza vaccination for all children <5 years of age, and the influenza vaccine will be funded on the NIP for children aged <5 years from 2020, alleviating the challenge to identify young children with SRMC. However, this still leaves Australian children and adolescents with SRMC aged ≥5 years in a targeted program. Elsewhere universal childhood influenza vaccination programs have increased coverage in children with SRMC. [18]

Australian studies suggest a recommendation to be highly influential when delivered by a specialist [7-9], yet we found some specialists did not perceive providing a recommendation to be their role. Another study [13] of paediatricians found 16.8% disagreed administering influenza vaccination was their role. Conversely, a study exploring the reasoning behind decisions to immunise young children against influenza from primary care providers found discussions surrounding influenza vaccination to be opportunistic, with deferment to paediatricians regarding children with SRMC. [19] Whilst vaccine administration may be impractical in some circumstances, fostering a greater collaborative partnership could assist all medical professionals treating children with SRMC to take joint ownership for providing the recommendation, with repeated consistent messaging reinforcing its importance to parents.

The ATAGI is currently working on consistency in identifying categories of 'at risk' groups identified in the Australian Immunisation Handbook, [17] including specific medical conditions and the increasing use of immunosuppressive therapies in these patient groups. (Personal communication, N Crawford) This will need to be communicated to all stakeholders involved in the provision of influenza vaccination. The 2019 ATAGI statement on seasonal influenza recommends vaccination for people with any of the medical conditions listed in Table 6. [20] Additionally, the Guidelines for preventive activities in general practice (Red Book) [21] published by the RACGP should include the most recent influenza vaccination recommendations to ensure messages are within reach of the broadest audience of GPs and therefore remain consistent with ATAGI and specialists.

This is the first study to provide the unique perspective of Australian medical professionals linked to a child with a SRMC, ensuring we captured GPs and paediatric specialists at the core of primary health prevention for these children. Our study is not without limitations, particularly the low response rate despite the use of reminders, and although paediatric specialists had a higher response rate, most respondents were GPs. This likely represents the workload of Australian GPs and paediatric specialists and is consistent with other surveys.

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Table 6. Medical conditions associated with an increased risk of influenza disease complications and for which individuals are eligible for free vaccination under the National Immunisation Program

Category	Vaccination strongly recommended for individuals with the following conditions
Cardiac disease	Cyanotic congenital heart disease, congestive heart failure, coronary artery disease
Chronic respiratory conditions	Severe asthma, cystic fibrosis, bronchiectasis, suppurative lung disease, chronic obstructive pulmonary disease, chronic emphysema
Chronic neurological conditions	Hereditary and degenerative CNS diseases, seizure disorders, spinal cord injuries, neuromuscular disorders
Immunocompromising conditions	Immunocompromised due to disease or treatment, asplenia or splenic dysfunction, HIV infection
Diabetes and other metabolic disorders	Type 1 or 2 diabetes, chronic metabolic disorders
Renal disease	Chronic renal failure
Haematological disorders	Haemoglobinopathies
Long-term aspirin therapy in children aged 6 months to 10 years	These children are at increased risk of Reye syndrome following influenza infection

Reference: Australian Technical Advisory Group on Immunisation (ATAGI), Statement on the administration of seasonal influenza vaccines in 2019. Australian Government Department of Health: Canberra; April 2019 Available at: https://beta.health.gov.au/resources/publications/atagi-advice-on-seasonal-influenza-vaccines-in-2019

Table 4: Medical practitioners caring for children with SRMCs beliefs towards influenza vaccination (N=198)

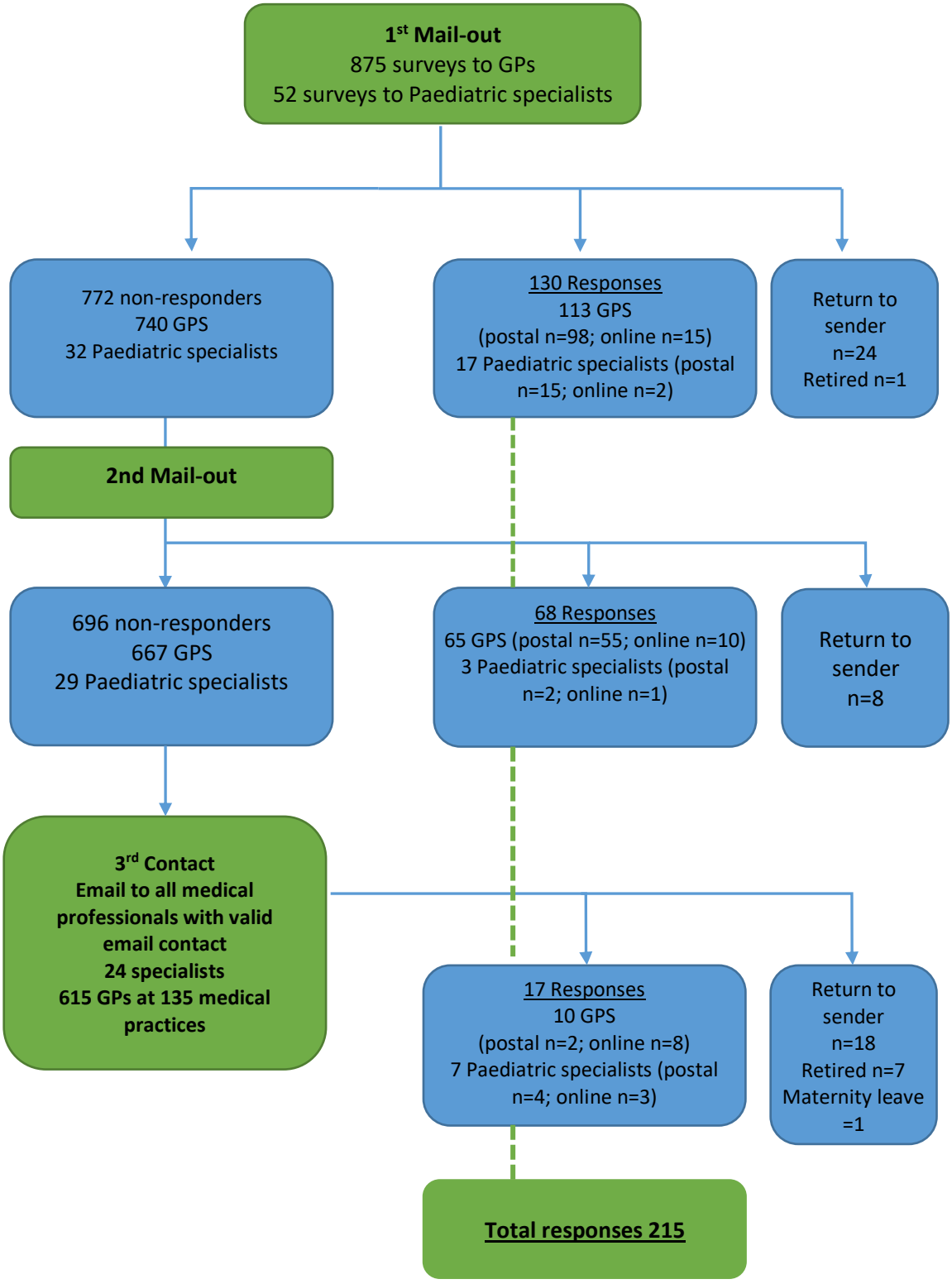
Belief	Routinely recommend influenza vaccination for children with SRMCs	Strongly disagree / disagree	No view either way	Strongly agree / agree
		n (%)	n (%)	n (%)
Consultation time sufficient to discuss influenza vaccination	**overall**	**33(16.7)**	**31(15.7)**	**134(67.7)**
	always	12(15.8)	6(7.9)	58(76.3)
	mostly	13(14.1)	21(22.8)	58(63.0)
	sometimes/never	8(26.7)	4(13.3)	18(60.0)
Influenza vaccination is a clinical priority	**overall**	**30(15.2)**	**37(18.7)**	**131(66.2)**
	always	6(7.9)	6(7.9)	64(84.2)
	mostly	15(16.3)	26(28.3)	151(55.4)
	sometimes/never	9(30.0)	5(16.7)	96(53.3)
Complexity of a child's medical condition does not limit discussing vaccination	**overall**	**32(16.2)**	**26(13.1)**	**140(70.7)**
	always	9(11.8)	4(5.3)	63(82.9)
	mostly	14(15.2)	19(20.7)	59(64.1)
	sometimes/never	9(30.0)	3(10.0)	18(60.0)
Providing a recommendation not limited by certainty, that 'at risk' condition qualifies.	**overall**	**23(11.6)**	**33(16.7)**	**142(71.7)**
	always	4(5.3)	5(6.6)	67(88.2)
	mostly	14.0(15.2)	18(19.6)	60(65.2)
	sometimes/never	5.0(16.7)	10(33.3)	15(50.0)
I feel equipped to respond to parent's questions, even if a child's medical care involves a specialist	**overall**	**25(12.6)**	**37(18.7)**	**136(68.7)**
	always	6(7.9)	8(10.5)	62(81.6)
	mostly	11(12.0)	23(25.0)	58(63.0)
	sometimes/never	8(26.7)	6(20.0)	16(53.3)

Table 5: Multivariable regression for the effect of characteristics on routinely recommending the influenza vaccine mostly or always (N=198)

			Crude			Adjusted model #		
Characteristic		**Level**	**OR**	**95% CI**	**p value**	**aOR**	**95% CI**	**p value**
Demographic variables	Regional (versus metro)		0.32	(0.14-0.73)	0.007	0.26	(0.10-0.70)	0.007
	Full time (versus part time)		1.60	(0.71-3.59)	0.257	1.87	(0.74-4.72)	0.185
	HCP Type	GP	ref	-	-	ref	-	-
		Sub Specialist	1.63	(0.36-7.43)	0.531	1.39	(0.23-8.54)	0.72
	Time practicing medicine	<16 years	ref	-	-	ref	-	-
		16+ years	1.14	(0.47-2.79)	0.769	0.78	(0.26-2.34)	0.652
	Receives vaccine yearly	Yes	3.41	(1.16-10.01)	0.026	3.96	(1.12-14.03)	0.033
Views and beliefs towards influenza and influenza vaccination	Influenza vaccine is effective	Yes	1.50	(0.40-5.69)	0.551	0.88	(0.19-4.07)	0.865
	Influenza vaccine is safe	Yes	1.96	(0.20-19.57)	0.565	2.47	(0.18-33.04)	0.496
	Consultation time sufficient to discuss influenza vaccination		1.41	(0.62-3.22)	0.418	1.59	(0.58-4.42)	0.370
	Influenza vaccination is a clinical priority		2.06	(0.91-4.62)	0.081	1.15	(0.41-3.22)	0.795
	I feel equipped to respond to parent's questions		2.06	(0.91-4.65)	0.083	1.09	(0.37-3.16)	0.878
	Confidence in understanding all of the conditions considered 'medically at risk'		2.26	(1.46-3.50)	<0.001	1.82	(1.04-3.17)	0.036
	A recommendation is my responsibility		10.47	(3.05-35.98)	<0.001	7.35	(1.67-32.26)	0.008

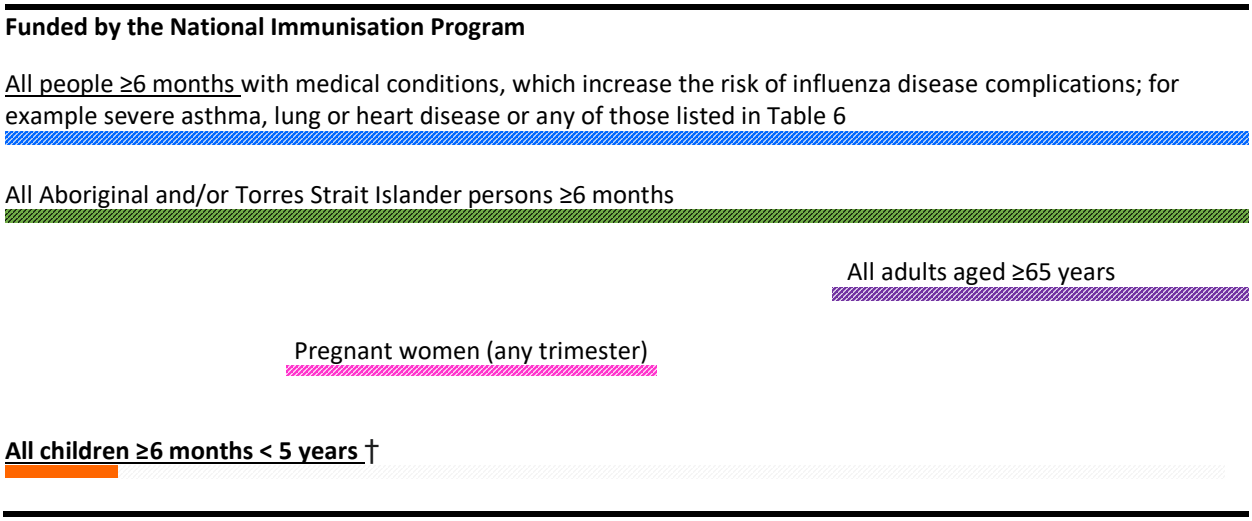
adjusted for all other variables

Figure 1: Participant recruitment



Footnote: Return to sender were medical practitioners who no longer practiced at the nominated address.

Figure 2: Eligibility for funded influenza vaccines for 2020



Footnote: Annual influenza vaccination is recommended, but not NIP-funded, for all people ≥6 months of age and other groups are strongly recommended but not NIP-funded. †Previously funded from 2018 by individual states Victoria/New South Wales/ Queensland/ South Australia/ Western Australia (since 2007)/ Northern Territory/ Tasmania. Reference: Australian Technical Advisory Group on Immunisation (ATAGI), Statement on the administration of seasonal influenza vaccines in 2019. Australian Government Department of Health: Canberra; April 2019 Available at: https://beta.health.gov.au/resources/publications/atagi-advice-on-seasonal-influenza-vaccines-in-2019 and Pharmaceutical Benefits Advisory Committee (PBAC), Positive Recommendations - July 2019. Available at： http://www.pbs.gov.au/industry/listing/elements/pbac-meetings/pbac-outcomes/2019-07/positive-recommendations-07-2019.pdf

Table 1. Demographics of survey participants

		Eligible sample N= 868[†]	Returned surveys N=215	Complete surveys N=198[††]
	Level		**n (%)**	**n (%)**
Gender	Male	509 (58.6)	107 (49.8)	99 (50)
	Female	359 (41.4)	108 (50.2)	99 (50)
Practice location	Metro	675 (77.8)	161 (74.9)	148 (74.7)
	Regional	193 (22.4)	54 (25.1)	50 (25.3)
Time practicing medicine	<5 yrs	9 (1.0)	8 (3.7)	7 (3.5)
	6-10 yrs	92 (10.6)	22 (10.2)	21 (10.6)
	11-15 yrs	104 (12.0)	23 (10.7)	22 (11.1)
	16+ yrs	663 (76.4)	162 (75.3)	148 (74.7)
Specialty of medical practitioner	**General practice (N=820)**	**820 (94.5)**	**188 (87.4)**	**175 (88.4)**
	Subspecialist (N=48) [§]	**48 (5.5)**	**27 (12.6)**	**23 (11.6)**
	General Paediatrics	14	11	10
	Cardiology	3	1	1
	Endocrinology	4	2	2
	ENT	3	1	1
	Gastroenterology	4	2	1
	Metabolic	2	2	2
	Nephrology	3	1	1
	Neurology	4	3	2
	Orthopaedics	1	1	-
	Paediatric Surgery	1	-	-
	Pulmonary Medicine	5	2	2
	Rheumatology	2	-	-
	Urology	2	1	1
Work status	Part time	-	81 (37.7)	74 (37.4)
	Full time	-	134 (62.3)	120 (62.6)
Survey method	Online	-	39 (18.1)	38 (19.2)
	Postal	-	176 (81.9)	160(80.8)

Footnote: Gender and time practicing medicine for the eligible sample derived from APHRA; practice location derived from practice address. [†] excludes surveys returned to sender, retired or on maternity leave. [††]Participants with missing data were excluded listwise from the dataset with the exception of those who were missing data for the variables, "A recommendation is the responsibility of a child's specialist"(n=4), "The 'at risk' medical conditions are well defined "(n=2) and "A universal recommendation for all children is justified"(n=4). Denominators are clearly indicated where these data are presented.
[§]subspecialist categories presented by number only.

Table 2: Medical practitioners caring for children with SRMCs knowledge and practices towards influenza vaccination (N=198)

Influenza vaccination knowledge or practice	Frequency/ Level	n (%)
Awareness of recommended for children aged >6 months with SRMCs to receive the influenza vaccine	Yes	194(97.8)
	No	4(2.0)
Discuss influenza infection with parents of children with SRMCs	Always	72 (36.4)
	Mostly	96 (48.5)
	Sometimes	27 (13.6)
	Never	3 (1.5)
Level of confidence in understanding all the conditions considered 'medically at risk' for influenza	Very	38 (19.2)
	Confident	104 (52.5)
	Somewhat	43 (21.7)
	A little	8 (4.0)
	None	5 (2.5)
Routinely recommend influenza vaccination to parents of children with SRMCs	Always	76 (38.4)
	Mostly	92 (46.5)
	Sometimes	28 (14.1)
	Never	2 (1.0)

Table 3: Suggested topics and format of future educational resources

Format	·	online webinars/modules (interactive)
	·	email
	·	Online/ electronic printable leaflet
	·	brochures/ poster displays
	·	local face-to-face (including regional)
	·	stickers for medical record books
	·	CPD events
	·	School education and parent groups
	·	you tube videos
	·	An app
Topics	·	Succinct summary of recommendations (who, where and how)
	·	benefits
	·	complications / sequelae
	·	reminder lists of who/when to offer
	·	Numbers of deaths + hospitalizations - (e.g. relative to meningococcal infections)
	·	Concise/better explanation of qualifying medical conditions (at risk)
	·	Vaccine efficacy /safety adjuvants preservatives etc

Title: Seasonal influenza vaccination for children with special risk medical conditions: does policy meet practice?

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Conflict of Interest

JT and NC report no conflict. HM is an investigator on clinical trials of investigational vaccines sponsored by Industry. Her institution receives funding from Industry (GSK, Pfizer, Novavax) for Investigator led research. She does not receive any personal payments from Industry.