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Perceptions of influenza and pneumococcal vaccine uptake by older persons in Australia

Lynne Briggs [a,*], Patricia Fronek [a,b], Val Quinn [a], Tracy Wilde [a]

[a] School of Human Services and Social Work, Griffith University, Gold Coast Campus, Parklands Drive, Southport, QLD 4222, Australia
[b] Law Futures Centre, Griffith University, Nathan Campus, 170 Kessels Rd., Nathan, QLD 4111, Australia

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ABSTRACT

Background: Influenza and pneumococcal vaccinations reduce adverse health outcomes in older adults. The Australian National Immunisation Program (NIP) provides free seasonal influenza and pneumococcal vaccinations for adults ≥65 y. Guidelines recommend all adults ≥65 y receive one dose of 23-valent pneumococcal polysaccharide vaccine (23vPPV) regardless of their risk of invasive pneumococcal disease. However, the reported rate of vaccination against pneumococcal disease is much lower than seasonal influenza. Identifying and understanding the perspective of older people on vaccination is important to informing effective promotional strategies for this age group.

Methods: Using a purposive and snowball recruitment strategy, 36 participants aged between 65 and 84 years of age were recruited in south-east Queensland and northern New South Wales. Face-to-face qualitative interviews conducted between July 2017 and January 2018 were recorded, transcribed and thematically analysed.

Results: In this sample, the uptake of the influenza vaccine (n = 28, 78%) was greater than for the pneumococcal vaccine (n = 14, 39%). Five key themes identified were health practitioner influence; anti-vaccination influence; social responsibility; work-based vaccination; and perceptions of age. The influences on uptake were complex and multi-faceted.

Conclusions: Findings provide new insights, in particular, the role of social responsibility, the long-term impact of workplace vaccinations, and how older people do not necessarily consider themselves old.

1. Background

Older people rank amongst the most vulnerable groups at risk of complications and premature mortality from influenza and pneumococcal disease alongside the very young, people with chronic diseases and, in Australia, Aboriginal and Torres Strait Islander peoples ≥50 y [1–3]. Older Australians also remain active in work and the community longer due to overall better health and increased life expectancy [4]. Vaccination plays a key role in the prevention of disease and the maintenance of their health.

The Australian National Immunisation Program (NIP) has provided influenza and pneumococcal vaccinations for ≥65s since 1999 and 2005 respectively [5–7]. The 23-valent pneumococcal polysaccharide vaccine (23vPPV) has been available through the NIP since 2005 and through some state health departments from 1998 [8–12]. The Australian Technical Advisory Group on Immunisation and the Therapeutic Goods Administration recommend one dose of 23vPPV (Pneumovax23) for all ≥65ys and a second dose only for those with increased risk of invasive pneumococcal disease (IPD), a notifiable disease. In the period 1 October to 31 December 2018, 38% [n = 173] of all reported IPD deaths [n = 425] were people aged ≥65y, the largest number of all age groups [13]. Of the 3.5 million Australians ≥65y, only 51% are said to be vaccinated against pneumococcal disease [7]. For influenza, Fluad and Fluzone High Dose were made available through the NIP in 2018 following one of the worst seasons on record [14–17]. According to the last Australian Adult Vaccination Survey (2009), more older adults (74.6% = 2.2 million) had received influenza vaccines than the pneumococcal vaccine (54.5% = 1.6 million) since the inception of the NIP [18].

In Australia, seasonal influenza vaccination is well publicised for all age groups promoted by campaigns, health professionals and in workplaces, whereas 23vPPV appears to have a much lower public profile [1,19]. It has been suggested that general practitioners (GPs) recommend pneumococcal vaccine less often because

* Corresponding author at: School of Human Services and Social Work, Griffith University, Gold Coast Campus, Parklands Drive, Southport, QLD 4222, Australia.
E-mail addresses: l.briggs@griffith.edu.au (L. Briggs), p.fronek@griffith.edu.au (P. Fronek), v.quinn@griffith.edu.au (V. Quinn), tracy.wilde@griffith.edu.au (T. Wilde).

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people with pneumococcal illness are more likely to present to acute care [20,21]. Other factors include media and government emphasis on childhood vaccination, older people who are less informed or mistrust vaccinations, and ongoing debates about effectiveness and cost benefits [5,22–25]. Australian government research found that older people were generally receptive to vaccination [26]. Participants ≥70s in the focus groups either considered themselves healthy and not at risk of illness, held beliefs such as vaccination caused 'the flu', or were keen proponents of vaccination [26].

The literature suggests making decisions to vaccinate or not is a complex process. The vaccination hesitancy model, not used in the present study, proposes that factors influencing decisions can be categorised as convenience (access), complacency (perceptions of need) and confidence (trust in the provider) [27,28]. Other studies have found older people are more likely to be vaccinated if they are female, have a medical risk factor, hold perceptions of poor health, have lower education, trust vaccinations and live in the city [6,22,24]. Accessibility to vaccines which includes cost, location of health centres and transport are key influences on vaccination uptake [6,24]. Transport and the location of services particularly access to domiciliary services are important for those older people who may be physically immobile, have limited transport options or the relevant information to support self-advocacy [24]. State regulated pharmacist-administered vaccination increases accessibility and have been evaluated positively by recipients [29].

Links have been made between vaccination uptake and individual beliefs about susceptibility and vaccine effectiveness [30,31]. Nagata and colleagues suggest awareness of the severity and impact of influenza and pneumonia are important to pro-vaccine behaviour [24]. It follows that individuals with a chronic condition or a poor perception of their health are more likely to be aware of disease risk and to understand their heightened susceptibility while people who perceive themselves to be in "good" health are less likely to be vaccinated [6,22,23]. It is also suggested that older people already understand the need for vaccinations based on their own experiences of communicable diseases lending support to the importance of including vaccine characteristics in discussions [32].

Information and recommendations from doctors are associated with increased vaccination uptake in older people [24,31,33,34]. In Australia, written information for people ≥65y was found to lack cultural relevance, readability and emotional connections [7,26]. Therefore, rather than relying solely on written information, the quality of doctor-patient relationships and communication skills when proposing vaccination becomes particularly important [30,35]. While health practitioners are influential, peers and all forms of media are said to raise awareness in older people [30,31].

A growing body of research examines influences on immunisation uptake in older adults, nonetheless, few studies examine the issue from the older person's perspective within the Australian context using in-depth qualitative methodologies [6,23,24,26,36–38].

2. Methods

The qualitative study reported here, conducted between 2017 and 2018, explored perceptions on vaccination uptake for influenza and pneumococcal disease from the perspective of 36 people ≥65y in Australia. The theoretical paradigm [39] which informed the development of the interview guide, data collection and analysis was subjective and interpretive as it aimed to understand the varied perspectives of participants on the two vaccines. Ethics approval was granted by the Griffith University Human Research Ethics Committee (GU Ref No: 2017/338).

2.1. Participants

Participants ≥65y were recruited using purposeful and snowball sampling. Invitations were posted in medical centres, sporting clubs and community centres in two Australian states, south-east Queensland and northern New South Wales. Interested volunteers were invited to contact the researchers. Three participants suggested a further six people whom they believed would be interested in participating in the research, and recruitment information was provided on request. All six volunteered to participate in the study. Inclusion criteria was ≥65y, the capacity to communicate in English, and to give informed consent. Participant information explaining the study, informed consent and other ethical requirements, was provided to volunteers. Signed consent was obtained and re-confirmed verbally at interview.

2.2. Interviews

One semi-structured interview (60–90 mins) was conducted with each participant in homes, community centres or available offices between July 2017 and January 2018. Interviews were divided between two experienced researchers. Demographic data was collected. Closed questions asked whether participants had received annual influenza and pneumococcal vaccinations. The interview guide was not based on any pre-existing models or constructs [40]. Rather open-ended questions (e.g. Can you tell me what motivated you to be vaccinated against influenza?) were designed to elicit participants' perspectives on influenza and pneumococcal vaccinations, perceptions of benefits and risks, and influences on their decision to vaccinate or not. Prompts and probing questions enabled further elaboration allowing each participant to describe their experiences. Interviews were recorded, transcribed and deidentified for analysis.

2.3. Analysis

Thematic analysis [41] was conducted manually and independently by two researchers to address bias. First and second level coding was conducted line by line and themes were developed using an iterative process, outlined in Table 1: Theme Development. Results were compared and refined. There was strong alignment between researchers. Although some codes and themes were named differently, agreement was easily reached. Clear documentation of analytical processes conducted at each stage and member checking addressed rigour [42].

3. Results

Of the 36 participants, 26 (72%) were female and 10 (28%) male. Twenty-eight (78%) had received the seasonal influenza vaccination and 14 (39%) who reported being vaccinated against pneumococcal disease had also received the influenza vaccine. All participants had some knowledge of the severe consequences of both diseases. All were aware of free vaccinations for influenza, but 20 (56%) were unaware of the availability of the pneumococcal vaccination for ≥65ys. Demographic characteristics are shown in Table 2: Frequency Distribution of Demographic Characteristics (N = 36).

Twenty-eight participants (78%) were well educated, middle-class, holding pre-retirement professional careers in a range of fields including healthcare and two were still working. Twenty (56%) participants volunteered in health and other organisations or were members of clubs. While there were commonalities, participants were a heterogenous group with varied perspectives and insights. As participants described their perspectives on vacci-

Table 1
Theme development.

First level coding (n = 21)	Second level coding (n = 10)	Themes developed (n = 5)
Doctors	Meaning given to age	Health Practitioner Influence
Nurses	Influential people	Anti-vaccination Influence
Pharmacists	Other external influences	Social Responsibility
Alternative medicine	Perceptions of risk	Work-based Vaccination
Positive	Perceptions of health	Perceptions of Age
Negative	Concern for others	
Prompts/reminders	Independence	
Decision making	Self-determination	
Children	Beliefs about vaccination	
Spouse		
Other family		
General community		
Experience of vaccination		
Childhood influences		
Knowledge of influenza		
Knowledge of pneumonia		
Knowledge of vaccination		
Co-morbidities		
Receives influenza vaccination		
Received pneumococcal vaccination		
History of vaccination		
Experience of illness in self		
Experience of illness in others		

Table 2
Frequency distribution of demographic characteristics (N = 36). Mean age = 70.42 - years; Std. Dev. 5.12; Range 65–84 years.

	(n)	(%)
Gender		
Female	26	72
Male	10	28
Ethnicity		
Australian	34	94
Malaysian	1	3
Italian	1	3
Location		
Queensland	31	86
New South Wales	5	14
Urban	29	81
Regional	7	19
Previous Occupation		
Academic/Education	10	28
Professional/Law/Arts	7	19.5
Government/Bank	4	11
Management/Administration	7	19.5
Community Work	3	8
Sales/Labours	5	14
Current Activity		
Still Working	2	5.5
Volunteer/ Active in Clubs	20	56
Vaccinated		
Influenza: Yes	28	78
Influenza: No	8	22
Pneumococcal: Yes	14	39
Pneumococcal: No	22	61
Total Received Both Vaccines		
Pneumococcal and Influenza	14	39

nation, it became clear during analysis that decisions to vaccinate for many participants were the result of accumulating influences. Some of these were highly individual, for example, exposure to pandemics, death of a parent due to pneumonia, a child with a disability, and personal illness events contributed to their decisions to vaccinate or not. As well as noting unique influences, five key themes were identified during analysis. These are: health practitioner influence; anti-vaccination influence; social responsibility; work-based vaccination; and perceptions of age and susceptibility.

3.1. Health practitioner influence

Participants considered prompts to vaccinate against influenza affective. Prompts included posters and brochures in GP waiting rooms, reminder telephone calls and computer-generated letters. Participants could not recall such prompts to vaccinate against pneumococcal disease. However, the majority of participants placed their trust and confidence in recommendations and information from their doctors, for example, "*GPs are the only ones I listen to*" (#1), "*I've got a GP doctor that I've known for seven or eight years and he's very, very good. So, I trusted his judgement.* " (#29), and "*You need to respect the doctor and do as that doctor suggests. . .I don't know better than a doctor.*" (#10).

Participants who had been immunised against pneumococcal disease had done so at their doctor's recommendation and were also receptive to influenza vaccination. Participants who were previously unaware of the pneumococcal vaccine indicated intention to pursue it with their GP, "*So, I think it's something* [pneumococcal vaccination] *that I should probably look into, and I'll certainly ask my doctor about, with regard to my own health. Next time I'm in there I'll bring it up.*" (#1).

With only a few exceptions, trust in GP recommendations to vaccinate and, for some, trust in science more broadly, were key to influencing uptake.

3.2. Anti-vaccination influence

Some health practitioners acted as deterrents to uptake behaviours. Two nurses expressed anti-vaccination beliefs to two participants, one while administering an influenza vaccination. Some pharmacy staff, three chiropractors and one GP who practised alternative medicine were openly anti-vaccination as reported by participants. However, it was only those participants who held pre-existing anti-vaccination beliefs that uncritically accepted these perspectives. One participant described her reaction to the chiropractor,

> "*My chiropractor is always going on about it [not having vaccinations] . . .But if you're coming from one side you're often not open to the reasons on the other side, so I think I probably make more of my own informed decision given all the information I get from other people.*" *(#21),*

and, *"I take the information to my doctor and talk it through with her and take her advice. I wouldn't make a decision in ignorance, I would get some expertise*" *(#2)*,

Three participants held anti-vaccination beliefs, some considered anti-vaccination perspectives before rejecting them, others spoke disparagingly and considered *"anti-vaxers*" to be a small number of vocal people who only posed risks to the uninformed. Different perspectives within families created tensions. Two participants were vaccinated despite the opposing views of their spouses, as described by one participant in the following excerpt.

"...she's not so comfortable having influenza vaccinations, and she tells me I don't need to either but I do ... my wife, she's naturopath and she doesn't vaccinate." (#6)

Some participants also had to manage relationships with other family members. One participant said,

"I won't even enter into any discussion because I know it will end in grief, because [relative] is so adamant - so adamant - that vaccinations are bad and leads to autism, and all those sorts of things that, you know, they get on the bandwagon about." (#12)

Anti-vaccination beliefs when held by children or grandchildren worried participants. Those participants concerned for their descendants tried to deliver positive messages about vaccination.

Some participants grew up in households where alternative medicines were the norm but still chose to be vaccinated while others described a parent who ensured their children understood the value of vaccinations. Many participants spoke of diseases once prevalent from the Spanish and Asian influenza epidemics to polio and childhood diseases that have re-emerged. From their perspective, the lack of exposure to the consequences of these diseases has contributed to anti-vaccination movements today. Despite knowledge of disease and its consequences, participants with anti-vaccination beliefs did not support any vaccination and one preferred to ward off influenza by taking homeopathic drops provided by a naturopath.

3.3. Social responsibility

Although participants who accepted vaccinations were concerned about maintaining their own health, a key driver was concern for others, for example, "*I think there's a social responsibility too, not to pass it on to other people*" (#19), and "*you're not going to pass it on to anyone in the shopping centres*" (#32). Concern for the health and livelihood of grandchildren and other family members pervaded the data, followed by responsibility for the community in general, for example, "*well a) just for my own health and b) is that I don't pass it on to my grandchildren who are six and four, or pass it on to somebody else*" (#27).

Influenza vaccinations are provided in human services and health organisations where some participants volunteered and in some settings was a mandatory requirement. For one participant, a volunteer in a hospital, concern for others (patients, volunteers and staff) also extended to monitoring the vaccination status of fellow volunteers,

"[It is] flu injection time. [Participant asks a fellow volunteer if they will be getting the annual influenza vaccination] Are you having it? And if you get someone say, 'well I'm not having it', we'll [say to them], 'well you better go back to the office and stop being a volunteer, because you won't be in the hospital anymore. And if you don't go and tell them, we will'. Because it's protecting other people." *(#P3)*

Some participants also spoke about the benefits of vaccination in institutions where people lived, worked or volunteered in close proximity such as in aged care facilities, hospitals, prisons, schools, shopping centres and airlines, and for people living in rural and remote areas where access to vaccination posed practical challenges, and for vulnerable groups including Indigenous communities, migrants, refugees and people in low socio-economic circumstances.

3.4. Work-based vaccination

Findings suggest that providing influenza vaccination to younger people in the workplace is important to continuing this behaviour in later life. With the exception of one, all participants who were first vaccinated for influenza in the workplace several decades earlier continued annual vaccinations in retirement, including paying for vaccinations prior to the free coverage by the NIP. As one participant described,

"And then, there was a program where they would come to the workplace, and they would do it in a day, or two days, and make it available and, so, I guess that got me into doing it. And, of course, since I've finished work, then I just continued with it. I just go to my GP." *(#14)*

For another,

"The furthest back I can remember is, I used to work for [name of organisation], so they offered it for free. They just got a nurse in. They were allocated a time and you just front up, and the nurse gave it to you. I started there when I was just 50, so that's about the first time I think I'm aware of having the flu injection. I had them every year and carried it on since leaving there. So, I still follow up and have that." *(#1)*

3.5. Perceptions of age

Overall participants identified as healthy, active, socially engaged and responsible individuals even with chronic or other health conditions. Even when receptive to vaccination, participants generally felt those in need of vaccination were less healthy or older than themselves. Perceptions of what it meant to be old ran throughout the data, e.g. "*I don't feel like I'm elderly*." (#21, 75yrs), "*I associate* [pneumonia] *with old people. And I'm not that.*" (#11, 73yrs), and "[both vaccinations are for] *the really elderly. I mean people in their nineties*" (#17, 65yrs). and,

"[pneumococcal vaccination] *is probably okay for older people, and I'm talking probably 85 plus. I'm talking old-old. For the flu, my impression of it is – it's there, and it's great for those who want it.*" *(#33, 75yrs)*

One participant framed ageing as a state of mind believing succumbing to being old was unacceptable,

Well ageing is just another social problem in a way that lots of people, particularly lower socioeconomic groups, just say, "I'm getting older, I'm now 104 or something or other, I'm really old" *and that's all there is about it...and that's very scary to me*" *(#6, 78yrs)*

4. Discussion

The sample did not represent a cross section of ≥65ys in Australian society. Participants were mostly well-educated, had an interest in their health and well-being and were socially active even when living with chronic conditions, perhaps accounting for their volunteering for this research. Lifestyles included volunteering, work, exercise, travel, social clubs and family. Deciding to vaccinate or not involved multi-faceted decision making incorporating

multiple influences and influencers. The majority were open to vaccinations even when there was disagreement in their families. Openness to vaccination included both influenza and pneumococcal vaccinations as did resistance. Not all participants were polarised as pro- or anti-vaccine, a small number were 'swinging voters' making year-by-year decisions with regards to seasonal influenza vaccination.

Seventy-eight percent of participants received influenza vaccinations, more than the reported national vaccination rate of 74.6% in ≥65ys [18]. The self-reported rate of 23vPPV vaccination (39%) was lower than that for seasonal influenza vaccination and lower than the national figure of 51% [7]. An Australian study published in 2016 compared self-reports of vaccination by ≥65ys with provider information and found self-reports of influenza vaccination were reliable whereas reports of pneumococcal vaccination were not. Of those who reported that they had not been vaccinated against pneumococcal disease, 77% had received the vaccine [43]. While verifying vaccination status with providers was beyond the scope of this study, participants were articulate, alert and expressed themselves clearly. Two participants were initially unsure if they had been vaccinated against pneumococcal disease when the question was posed and decided they had not. If self-reports of vaccination rates are to be accepted in this study, there is an under-utilisation of 23vPPV in this sample.

Consistent with the literature, the majority of participants in this study trusted their doctors and medicine in general [31,33,34]. A lesser focus by GPs on recommending 23vPPV has been noted in the literature [19,20]. Certainly, many of the participants in this study reported that they had never been offered the pneumococcal vaccination. It is possible that GPs may be reluctant to suggest 23vPPV for older people without chronic illness for two reasons. The first, long standing debates about effectiveness and cost benefit [5,22] and second, changes in official recommendations due to concerns about risks of revaccination following the recall of pneumovax in 2011. A review conducted by the TGA followed reports of a cluster of severe skin reactions. The outcome of which determined reactions were due to an increase in unnecessary repeat vaccinations in immunocompetent individuals [11].

Even where close relatives or health professionals rejected vaccinations, participants made their own decisions based on a range of factors including their own beliefs. Grandparents were concerned about the health of their families and made efforts where possible to exert positive influence while balancing the maintenance of family relationships.

The most interesting findings were social responsibility, the effects of work-based vaccinations and participants' perceptions of age. A lack of emotional connectivity in information about vaccinations for older people in Australia has been noted [26]. This is interesting when considering the theme *Social responsibility* (exemplified by concern for others, specifically family members and the broader community) and personal identities of being healthy and active. Most promotional strategies for older people are targeted at the individual level whereas a broader focus on feelings of responsibility to family and community could be considered when developing promotional materials and broader health prevention strategies.

The practice of providing influenza vaccinations in workplaces was beneficial as it did more than help maintain participants' health while they were employed. A receptive attitude towards vaccination was formed that continued into retirement. In light of the findings consigning older people to an aged and at-risk category can be at odds with their perceptions of being healthy, active and engaged adults, and importantly 'not old', even when living with chronic conditions. In some cases, this could lead to resistance to vaccination as the need for vaccination is relegated to those who are truly old and, therefore, at risk. As ≥65ys live longer and lead healthier lives, the issue of who is old and how people perceive their age is pertinent to how doctors communicate about vaccination to this age group.

Decision making for participants was complex incorporating a range of interacting factors. Single factors such as knowledge of vaccines, disease or free access were insufficient for vaccination acceptance. Knowledge of vaccinations for participants ranged from very well informed to misinformed. All participants understood the health consequences of influenza and pneumonia and nearly all participants referred to friends and relatives who had fallen ill or died from these diseases whether they themselves accepted vaccinations or not. A determination to make their own decisions and to maintain control contributed to individual decision-making and was important to these participants even when trust in their doctors was a key factor.

4.1. Limitations

Generalisability is not an aim of qualitative research. As such the findings of this study with low numbers and specificity of context cannot be generalised. The sample recruited did not represent a cross-section of society which was not an aim of the study and may reflect the interest in vaccination of the self-nominated volunteers.

5. Conclusion

The findings of this study offer new understandings of social responsibility, the value of work-based vaccination as an influence in later life, and perceptions of what it means to be old for older people. Although the findings of this study cannot be generalised and participants were a relatively advantaged group, important insights have emerged that can inform health promotion, communication between health professionals and older people, and how pro-vaccination behaviour can be supported by understanding their perspectives.

Declaration of Competing Interest

The authors declare no conflicts of interest.

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Authorship

Lynne Briggs was responsible for conception and design of the study. Lynne Briggs, Val Quinn acquired the data. Lynne Briggs, Patricia Fronek, Val Quinn and Tracy Wilde conducted analysis. Patricia Fronek produced the final draft and its critical revision.

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