



# Understanding pandemic influenza behaviour: An exploratory biopsychosocial study

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## Abstract

Pandemic influenza represents an ongoing public health threat. Understanding the associated behavioural domain is vital for future intervention development. Cross-sectional qualitative research employing purposive sampling employed a combination of one-to-one semi-structured interviews ( $n = 57$ ) and focus groups ( $n = 59$ ). Data were analysed using (1) inductive thematic analysis and (2) theoretical thematic analysis focusing upon resonance with psychosocial and sociocultural constructs. Two broad themes highlighted an important duality regarding the determinants of pandemic behaviour: (1) psychosocial determinants (e.g. agency, cognitions and identity) and (2) sociocultural determinants (e.g. social context and capacity). These findings suggest this duality should shape future intervention development.

## Keywords

health behaviour, health promotion, public health psychology, qualitative methods, risk, theories

## Introduction

The psychology of behavioural responses to pandemic behaviour is in its infancy. The corpus of work which relates to recent pandemics (e.g. severe acute respiratory syndrome (SARS), Avian flu and Swine flu) has been characterised as lacking theoretical orientation (Bish and Michie, 2010), having an inadequate international perspective, being over-reliant on cross-sectional and quantitative exploratory designs, and focusing on intentions rather than behaviour per se (e.g. Byrne et al., 2012; Myers and Goodwin, 2011; Teasdale et al., 2012). The fragmentary state of the field and the extant need for robust evidence in order to respond effectively to future epidemics indicates the need for a programmatic and mixed-method response to pandemic influenza research.

The Medical Research Council (MRC) complex intervention framework (Craig et al., 2008), with its flexible, iterative epistemology, highlights the need for various embedded research designs. This includes primary exploratory

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qualitative research focussed upon inductively understanding particular behaviours from an experiential perspective, exploring the role of theory in understanding behavioural change mechanisms, modelling behaviour change and appraising potential behavioural outcomes. Some conceptual work has begun to address the complexity of behavioural responses to pandemics in particular (i.e. the behavioural domain of 'pandemic influenza behaviour' (henceforth PIB)). These approaches conceptualise PIB as distinct *health* behaviours. To date, no research has sought to inductively examine the perspectives of the general public regarding their experiences of PIB or indeed the experiences of those at highest risk of ill-health through pandemic influenza infection, although some work has explored the likely public acceptability of implementing restrictive pandemic management measures (Smith et al., 2012) and other research has examined the acceptability of vaccination among those with high-risk conditions such as those living with cystic fibrosis (d'Alessandro et al., 2012).

This article explores the intersection of inductively derived experiential accounts of PIB and concomitant processes of behaviour change, with an exploration of the role of theory in modelling behaviour change. Our exploration of theory is inclusive, drawing upon a repertoire of concepts from health psychology as well as from cognate social sciences. For instance, the notion of scripts which draw upon the extra-individual and interpersonal rules of social conduct in particular social settings (the social organisation of conduct, see, for example, Gagnon and Simon, 1973), or indeed perspectives which focus upon how the social context of the individual enables and constrains their ability to exercise their agency (e.g. social, economic or cultural capital, see Bourdieu, 1986).

## Method

### *The sample*

Four purposive criteria were used to select respondents for one-to-one interviews and focus

groups into four mutually exclusive groups: (1) women who had been pregnant in 2009/2010, women or men with young children in child care in 2009/2010; (2) 'older' people (71 years of age and older); (3) people with compromised immune systems (HIV) and/or chronic respiratory illness (e.g. cystic fibrosis, chronic obstructive pulmonary disease) and (4) people who self-identified as 'healthy'. These groups were chosen to illuminate variation in behavioural response to pandemic influenza within groups identified as particularly susceptible to pandemic influenza infection (NHS, 2014).

### *Recruitment*

Participants were recruited through posting flyers, direct contacting of community and health organisations (>50) in Melbourne, Sydney and Glasgow. These procedures were supplemented by purposive sampling through the personal networks of the research team to reach specific sample groups (e.g. people living with HIV). A total of 116 people participated in the research; 57 took part in one-to-one interviews and 59 took part in focus groups (see Tables 1 and 2 below). Participants from all four groups took part within both focus group discussions and one-to-one interviews, with the exception of those women who had been pregnant in 2009/2010, and those women or men with young children in child care in 2009/2010; these participants only took part in one-to-one interviews.

### *Design*

Both interviews and focus groups were utilised to ensure 'depth and breadth' of talk within this exploratory project. One-to-one interviews present a useful approach to elicit in-depth experiential personal disclosure, whereas focus groups present a particularly useful approach to explore social mores and norms concerning pandemic influenza through the naturalistic and interactive nature of the discussions which ensue. The same broad topic guide was used throughout.

**Table 1.** The sample according to purposive selection criteria.

City	Pregnant/new baby in 2009	71 years of age and older	Immune compromised/respiratory illness	Healthy	Total
Sydney	3	6	18	26	53
Melbourne	6	4	10	17	37
Glasgow	6	0	16	4	26
Total	15	10	44	47	116

**Table 2.** Interviewees and focus group participants by city.

City	Interviewees	Focus group participants	Total
Sydney	18	35	53
Melbourne	26	11	37
Glasgow	13	13	26
Total	57	59	116

### *The topic guide*

A topic guide steered flexible discussions around specified topics, including (1) participant backgrounds, (2) experiences with influenza with a focus upon H1N1 and finally, (3) public communications to pandemic influenza with a focus upon H1N1. The interview style focussed upon providing respondents with the opportunity to tell their own stories in their own words and to elaborate upon factors that were of particular significance to them. Times and locations for interviews were arranged in conjunction with the respondents. Ethical approval for the whole study was granted by Monash University, Australia.

### *Analysis*

The interdisciplinary research team shared a critical realist epistemological position. Data analysis followed two distinct stages. Initial analysis was facilitated by the use of NVivo. This focussed upon identifying inductively derived themes (see Braun and Clarke, 2006). Following multiple readings of the transcripts, thematic areas were identified through identifying shared or common experiences and perspectives among the participants (e.g. 'drugs and antivirals', 'the role of the media'; 'personal flu

management', 'primary health care and general practitioners (GPs)', 'self-management'). This level of thematic analysis related to a realist and inductive (e.g. bottom-up) reading of the data and drew upon a hermeneutic of empathy in which, broadly speaking, what is 'real' to the participants was taken more or less at face value. Second, data relating specifically to 'personal flu management' and 'self-management' were analysed using 'theoretical' thematic analysis (Braun and Clarke, 2006) which focussed upon identifying key areas of resonance between the participants' inductively derived constructs and theoretical frameworks which seek to explain health behaviours. This second level of analytic focus required a hermeneutic of suspicion in which the data were interpreted and interrogated for their dialogue with pre-existing theoretical constructs and frameworks. In lay person's terms, we sought to question what was superficially present within the data. As a result, the analysis presented drew upon both the strengths of experientially oriented, participant-led data collection and also theories useful to health psychology. This dual approach aimed to understand the behavioural domain through exploration of participants' perspectives, and simultaneously advanced psychological theory of PIB.

Given the complexity and scale of the design, for example, the large number of participants, the three sites of data collection across two countries and the uneven distribution of particular participant groups according to recruitment site (i.e. that no people aged over 71 years were recruited in Scotland), it was not possible to conduct a systematic comparative analysis within the data set (such as that enabled through approaches such as Framework Analysis, see Gale et al., 2013) nor was this the aim of the research project. However, in the narrative account of the analysis which follows, on the occasions where there were clear overall patterns within the data these are highlighted.

The overall analysis is presented in two overarching themes. Broadly speaking, they relate to the intra-psychic and inter-psychic domains, which are (1) 'the psychosocial determinants of protective influenza behaviours' and (2) 'The sociocultural determinants of protective influenza behaviours'.

## Results

### *The psychosocial determinants of protective influenza behaviours: 'I guess it was all a risk benefit thing'*

Participants articulated the breadth and complexity of PIB (in relation to preventative, avoidant and the disease management aspects of influenza behaviours). Throughout, the participants highlighted the role of individual agency and the relevance of calculative and deliberate decision-making in shaping PIB. While all participants had assimilated public health information, implementing PIB seemed to be moderated by heightened risk perception. Across the sample, there was a discernible pattern that those with pre-existing health conditions were far more engaged with implementing PIB (preventative, avoidant and disease management) than those who self-identified as healthy (for more detail on this, see Stephenson et al., 2014). So, although the majority of participants talked about the adoption of preventative

behaviours, it was primarily those at greater risk who engaged in avoidant behaviours (e.g. those living with HIV), and only those at greatest risk who spoke of having engaged in management of disease (i.e. taking tamiflu – an antiviral medication that became available to treat H1N1). In this way, there was a sense of the face validity of several traditional health psychology constructs, such as 'perceived susceptibility' (Becker, 1974), which focuses upon the individuals perception of personal risk (e.g. How likely this will happen to me?) and at times 'perceived severity' (Becker, 1974), which address perceptions of the severity of an illness if contracted (e.g. How bad will it be if I get it?). Examples of how perceptions of risk figured within the analysis are presented below. For example, Tina, from a focus group of Black African women living with HIV in the United Kingdom, rehearsed the mechanism by which perceived susceptibility is associated with behaviour change in models such as the Health Belief Model (Becker, 1974):

I know my immune system is not strong as well. And you know so, I just try and do my bit, just to keep myself ... it's difficult you know, because you go into public places and sometimes we can, even just touching a worktop where maybe somebody who ... who has got ... it's, it's difficult to actually – I think each and every one of us should just try and ... and keep, keep ourselves as clean as possible. (HIV-positive African women living in Glasgow)

There was a clear sense of the individual, their agency and their perceived responsibility for managing PIB. Similarly, from a focus group of gay men living with HIV (Glasgow), the perceived severity of H1N1 infection was clearly apparent within the consensus regarding the impact of infection:

Rick: It crossed mine as well ... and I thought 'Well if I get it [H1N1], what next?'

Matt: And 'If I get it, I'm fucked really'.

Rick: Yeah.

Although commonplace among those with pre-existing health conditions, engagement with the implementation of PIB was also reported by those who 'became' a susceptible risk group within the H1N1 outbreak (i.e. pregnant women):

It's up to, the onus of the individual to have certain awareness on what to do. And I think the government maybe needs to give guidelines on maybe what should happen and explain why. (Deb, Melbourne, pregnant during H1N1)

Deb reiterated the centrality of the individual as a locus of responsibility. She also hinted that expert state-sanctioned knowledge (as another participant put it – 'a fair dinkum<sup>1</sup> outbreak') may be necessary as a cue to action, in order to persuade the public and enable them to make 'informed' decisions and thus implement PIB. Similarly, Marlene described how the increased knowledge and risk perception associated with fomites (objects which can carry infectious pathogens) led to implementing preventative PIB such as carrying and using sanitiser gel (for herself, but critically, for her family also):

I'd make sure that when the kids came in I got them to wash or gel their hands before they came in and when they left. And I was, I had a little [sanitiser] gel thing attached to my belt loop ... that I just kind of carried around everywhere, and I was washing my hands quite a lot as well. It was ... yeah. And I don't remember, I don't think I ever really wore a mask or anything like that. But ... and even if out in public, generally, not just work, just being more conscious of, you know, things that people touch like, you know, the handrails on escalators. I remember looking at them and thinking, 'Oh my goodness, how many people have touched this? It's disgusting! I'm not gonna touch it!' (Marlene, Sydney, respiratory illness and pregnant during H1N1)

There was a clear sense of heightened risk vigilance and also the tacit sense of her role within the implementation of family-level PIB. Gill below highlighted a broad range of factors determining PIB. Beyond the reiteration of the

individual as a key locus of behavioural change, there was also a clear sense of the importance of her having the capacity and self-efficacy to implement behaviour change:

I guess it was all a risk benefit thing. I didn't need to work. I didn't need to send my child to childcare or Kinder. I had, there wasn't that much, what's the word? of a [unclear] to stay home. And the benefits, you know, could have been quite high ... [...] It was fairly clear for me what to do but I didn't feel like anyone else was doing it ... We made our own decisions at home, based on what we knew and what we were in a position to do. (Gill, Melbourne, pregnant during H1N1)

Gill's extract reflected a strong sense of her individual agency. However, the shift in pronouns from 'I' to 'we' again suggests the importance of the family as an additional locus of decision-making. Yet, her awareness of the behaviours of others through social comparison implicitly hinted at the role of inequalities in shaping capacity to implement PIB. Her acknowledged privileged position enabled a sense of perceived behavioural control.

The participants also offered several practical strategies for avoidant PIB, for example, avoiding public places (e.g. GP surgeries) and finding strategic ways of minimising risk when forced to use these spaces (e.g. getting lifts with colleagues instead of commuting on public transport). For those with pre-existing health conditions or increased sense of culpability (such as the pregnant women, see below), on occasion, heightened perceptions of perceived susceptibility seemed to mediate sensible but unorthodox approaches to PIB (e.g. buying 'survival' provisions). More commonly, participants talked of common-sense strategies such as avoiding 'ill-looking' people:

I don't like being near people who are sick. So if they seem fluey, I don't go near them. If I've been somewhere where they look a bit sick, I'll make sure I'm washing my hands a lot. I don't like using the towels that they've been using. So yeah, a bit more sort of pedantic about where my hands are touching – things like that. Even like door handles

and everything. Sound like I'm a bit [No, no, not at all] in general, I'm not. (Deb, Melbourne, pregnant during H1N1)

While many participants implemented PIB with little difficulty (particularly those with pre-existing vulnerabilities), a minority of participants struggled. Claire, for example, highlighted a constellation of dilemmas which pivoted upon her sense of responsibility and culpability as she struggled to make decisions about PIB in the context of conflicting expert evidence:

Well it was so difficult just trying to get information and I was just so confused what to do because I got a letter from the GP inviting me to go. And I went and I said 'I don't know what to do because I'm not sure I just want to talk about it, talk over this'. I'm having a baby and I'm really confused and I felt pressurised to have it. It was quite, it was quite, what's the word? Judgemental, the GP said 'people like me are vulnerable' which I'm not compared to a lot of people and it was my responsibility to protect my unborn child from Swine Flu but as a parent you think 'Oh my God!' But then the media was telling you people had had the vaccine and died after it or they'd had a really bad reaction. I don't think it was his comment as the media was making out, but there was a bit of scaremongering about the Swine Flu vaccination, but equally they were people actually dying of the Swine Flu. So it was like 'What the hell do you do?!' (laughs) It's like 'I'm pregnant I need to try and do what's best for my child but the information I was getting was so judgemental. (Claire, Glasgow, pregnant during H1N1)

This theme has shown the importance of a psychological episteme in understanding the determinants of PIB. As models of health psychology would anticipate, persuasive expert communication, levels of knowledge, perceptions of risk, response efficacy and a sense of perceived behavioural control or self-efficacy were common features of the ways participants implemented PIB. However, the implicit mechanism of behaviour change that shapes such complex behaviours was moderated by illness identities (pre-existing health conditions), gendered identities (the burden of responsibility associated with motherhood) and hinted at the

important role of wider social contexts (shaping capability, self-efficacy and perceived behavioural control). The following theme addresses these latter aspects in more detail.

### *The sociocultural determinants of protective influenza behaviours: 'culture and the community does not support those kind of preventative measures'*

The second theme addresses participants' accounts of how implementing PIB was understood in relation to a range of social structures and distinctly, social phenomena. Although the analysis continues to reflect the role of individual agency, the social determination of PIB is also palpable. The scope of psychological and cognitive factors was embedded and materialised within social structures.

The first extract from Marilyn demonstrates how geographic proximity was central to her implementation of behaviour change. Like other pregnant women (newly susceptible to pandemic influenza during the H1N1 outbreaks of 2009/2010) she drew upon the local community to benchmark appropriate conduct, illustrating the power of local and arguably community descriptive norms in shaping PIB:

If it was in the area [closer to the outbreak], yeah, I think it would [change my behaviour]. I think it really would change. I don't know what I'd do, but if I found if I found it was at school, I'd definitely be finding out. I'd probably be a bit more of a follower than anything. I'd be finding out what other people are doing. How they're, what precautions they're taking. And, once again, it'd be my kids that I'd be protecting. Yeah, I don't know. I don't know if they'd go to school. I think they'd be staying home. (Marilyn, Melbourne, pregnant during H1N1)

In terms of considering other social contexts, for many participants, the work environment presented a particular challenge for implementing PIB. As Jan highlights below, decisions concerning the particulars of one's diary (and the threat of potential loss of employment) were

weighed up against the potential risk of infecting other people within the work environment. Her quote, although enshrining individual decision-making, also highlights the centrality of cultural expectations of occupational conduct and hints at wider economic determinants of PIB. Moreover, the shifting of personal pronouns (from 'I' to 'you' was suggestive of the moral aspects of PIB):

- I: So would you I suppose in some ways quarantine yourselves in terms of trying to minimise going out?
- Jan: I don't know. Like I'm not sure. It depends on what kind of commitments I had on. It's very hard to, like, if you've got commitments like, for example, my job, if you've got meeting, it's very hard to kind of say, 'Well I'm not gonna turn up "cause I might have the flu"'. I don't think that would be acceptable way to work. Actually, a lot of people who still come to work even when, even though they know they're sick, or they know they've been exposed to it. And I think that that is the biggest contributor. The culture and the community does not support those kind of preventative measures. (Melbourne, pregnant during H1N1)

Similarly below, Linda emphasises the influence of the wider social context, and suggests that the global economic situation framed a particular sense of surveillance within the workplace, which mitigated avoidant PIB such as self-imposed quarantine:

These days, we have got a climate of fear in the workplace. That climate of fear transcends into when people are sick. And when they become sick they don't want to stay home because they're worried about their job, or how it will be perceived. (Linda, Melbourne, healthy)

For the women who were pregnant through the H1N1 outbreaks (2009 and 2010), the

context of school and parenting featured as important aspects of the implementation of PIB. Perhaps as a consequence of its novelty, pregnant women sometimes talked of actively appraising their peer groups in an attempt to benchmark 'appropriate' norms of PIB conduct. Thus, participants recounted and operationalised pejorative labels to themselves and others ('*fruit loops*', '*germ freaks*') as they considered and struggled to implement the 'right' levels of PIB. As Angela (an Australian woman pregnant during H1N1) describes one of her friends; 'the virus thing was just, just sort of drove her like, you know, into this frenzy of protection'. Equally, Rebecca below highlights a range of factors shaping PIB, for example, the social performance of hand-washing and gel-use, the normative peer influence of other mothers and the anticipated stigma of being a 'bad mother':

- Rebecca: It [sanitiser use] is totally for show! It is really funny, it's like you see all these mums going 'Yeah I'm doing my alcohol gel' 'Yeah me too. What flavour is yours?' 'Oh mine's cucumber' 'Oh well mine's blah, blah, blah' and I'm like 'Eh, we're going to go and use some soap!' and it's like 'Well I'm not sure that's going to clean off all the germs properly!' and you did feel a little bit like judgemental about it.
- I: Well you did say when you're in a group of mothers and if you were the only one that wasn't.
- Rebecca: Everything is like that, everything about being a mum is totally on show though. It's really funny, there's always things that kids do that, you know, you go out with somebody to the park and I think I'm doing quite well because he's got a jacket on and then you get there and they've got scarves and gloves and hats and snow

boots and I'm like, 'Oh no, now I'm the bad mum'. (Glasgow, pregnant during H1N1).

The extract shows how subjective norms, conformity and consumerism coalesce to support preventative pandemic PIB. Despite Rebecca's scepticism and reticence, social influence within her peer group facilitated behaviour change. In contrast to these accounts which address the implementation of novel behaviours, several participants with long-standing vulnerabilities to influenza had, over time and successive infections, developed local social norms, shared practices and what can be described as local risk-reducing cultures, in ways which facilitated a shared (interpersonal) approach to risk management rather than solely individual implementation of PIB. These approaches often relied upon shared knowledge of underlying health conditions (e.g. cystic fibrosis), open lines of communication regarding ambiguous symptoms (disclosures of 'grey' areas), and a ready acceptance of the suspension of intimacy (e.g. kissing, hugging, hospitality) when there was danger of infection within the social unit. These kinds of risk-reducing approaches seemed to happen most readily within family units, although they were also reported within small social networks, or the work environment:

I've got a rather good workplace culture in terms of I've got a small department and they all know I've got a respiratory illness. So they know that if they've got bugs, if they've got a cold, and most people come to work with a cold, not the flu, but if they're capable of working, most people come. They'll say, 'Don't shake my hand today Cindy', or, you know, 'You sit on the other side of the table during lunch'. So it's good that my colleagues are aware of it. And just the general mentality of the office [later]. So it's a good culture whereby people come with sniffles but nobody comes if they're really [unwell] and I've been in workplaces where you come unless you're dying. So this workplace is pretty much 'if you're not feeling well then yeah, we know you can work – just don't give it to us and stay at home'. (Cindy, Sydney, respiratory illness)

Echoing many of the ideas concerning the occupational context other participants also highlighted the importance of the household and family unit in managing risks. Linda, for example, highlighted how within the domestic environment, transmission of influenza between family members instigated a household action plan for future infections:

Did my husband get it? Yes, he got it after me [seasonal influenza]. And that was the new rules he made: contentious, perhaps, but we decided that when this happens again, we don't love each, we love each other too much to give it to each other. So when one of us gets it, we go in the spare bedroom. And since we've done that, we've been able to stop the passing on of it. And I feel that was a very major thing. A very major thing in, you know, between people who are sleeping together and, you know, parents and children. Being in the one room and that sort of thing. (Linda, Melbourne, healthy)

As Linda noted, this was not an insignificant achievement and demanded the co-ordination of conduct across the family unit. The final extract from Mitzi living with respiratory health problems illustrates how the patterning of social relationships can on occasion inhibit PIB. She described a particular vulnerability to pandemic influenza not in terms of her underlying health condition but in terms of the particular power dynamics that result from her ongoing relationship with her GP:

It's amazing how many people don't do it or aren't seeming to be doing it. And my GP's the same. He, you know, has a listen to my chest. I don't see him wash his hands before or after. I don't know whether he does when I leave the room but, quite honestly, he probably doesn't. And that's back on me. Like I should be saying, 'Have you washed your hands?' I should ask him. But, again, I feel like he's in a position of power and I, you know, I don't wanna rock the boat. (Mitzi, Sydney, respiratory illness)

In summary, this theme has highlighted a range of sociocultural determinants of PIB. It has shown the centrality of social contexts in understanding and shaping PIB. The work



environment, the family environment and the school environment figure strongly as moderating individual-level responses to PIB and as providing opportunities for potential public health intervention. These local social contexts are understood as embedded within wider social contexts such as the community, cultural understandings of the ethics of PIB and macro contexts such as the current economic downturn. Moreover, they hint at the role of capacity, social capital and for those with pre-existing health conditions, illness-related assets (such as 'safe' disclosures of illness status and supportive and enabling social networks) in facilitating PIB.

## Discussion

The analysis has highlighted the varied ways participants talked about PIB. We have focussed on describing and interpreting participants' accounts and, where possible, considered areas of resonance with theories which relate to behaviour change and pandemic influenza.

Participants' accounts reflected the currency of the agential, rational and responsible decision-maker (i.e. the traditional health psychological subject). However, the contingent, qualified and caveat-oriented nature of the data was also illuminating. In general, although the idea of the informed and reasoned rational decision-maker was present, given the equal salience of wider social contexts, it figured for some as sometimes problematic, offering only partial insights into PIB. Crucially, participants talked of the adoption of PIB as often dependent on, and shaped by, social contexts, collective practices and material circumstances, that is, household, workplace, geography and travel. So although there was a tangible sense of the role of the individual within pandemic influenza risk management, context-dependent risk-reduction strategies were also apparent. In particular, the implementation of PIB within small social units was reported (the family, friendship networks and workplace cultures) wherein social roles such as motherhood and illness identities were important. Across the analysis participant accounts drew our attention to the social, contingent nature of 'individual'

PIB. The participants' accounts, for example, reiterated the importance of normative influence at a number of levels, for instance, outlining the presence of tangible health protective, descriptive, moral and injunctive norms concerning hand-washing, sneezing and sanitiser use. This resonates with work concerned with the development of an online intervention for preventing colds and flu, which also highlights the unusual importance of normative influence with regard to associated preventative behaviours (Yardley et al., 2011). Of note, in contrast to individual health behaviours, collective, protective, group-level risk-reduction approaches were also reported where gender, parenthood and workplace expectations and norms shaped the extent to which PIB was implemented. Health-protective scripts, governing interpersonal local practices, were described as shaping social and physical interactions within some settings (loosely defined by domestic and occupational boundaries). Equally, at times, norms and social practices inhibited PIB (e.g. wearing masks).

As an exploratory study employing purposive sampling, our analysis offers insights for enhancing public health interventions. It suggests it may be beneficial to examine cues to action, as within this data set they emerge as important in terms of mediating perceptions of risk. This echoes recent work which highlights the centrality of the affective dimensions of risk (rather than the cognitive); a finding which chimes with the current research (see Karademas et al., 2013). Within a process-oriented approach to behaviour change, such cues are understood to move people from contemplation to preparation and action (e.g. Prochaska and DiClemente, 1982). Given the ambiguity of early symptoms, pandemic influenza symptoms themselves may lack the catalytic quality needed to 'kick start' behaviour change at individual and population levels observed with other conditions. Drawing on social-marketing principles, addressing a particular influenza as novel and as distinct from its predecessors may be useful (the social-marketing ideas of a 'flu brand' and 'competition' with previous mass media campaigns may be useful to explore). Further research and

- There is a need for evidence synthesis: - detailed examination of role of socioeconomic status, gender and ethnicity in relation to capacity, self-efficacy, intentions and ability to implement PIBs; the role of symptom recognition in implementing PIBs; the role of normative influence in shaping both historical and novel PIBs.
- There is a demonstrable need for more mixed methods exploratory research
- The feasibility and acceptability of both ‘work’ and ‘household’ based interventions concerning the systemic and interpersonal management of pandemic influenza symptoms, vulnerabilities and action plans.
- The feasibility and acceptability of targeting interventions to key individuals because of their role within particular social contexts, for example, the gendered aspects of PIBs outlined in this paper suggest the potential role of exploring, and perhaps clearly contesting, the role of women within the household as a means of engaging men with familial responsibility within heteronormative households.
- The feasibility and acceptability of interventions which modify social and cultural contexts (e.g. patterns of work, travel, acquisition of essential goods) as a means of enhancing PIBs within inter and intrapersonal contexts.

**Figure 1.** Future research questions raised by this study.

intervention development which addressed the uncertainty of symptoms, their timing, their relation to infectivity, their relation to the norms of PIB and clear workplace policy and practice about appropriate conduct with regard to uncertain symptoms may be worth exploring (see Figure 1). Equally, perceived susceptibility may be worth examining in more detail, particularly in relation to its emotional aspects (Karademas et al., 2013). Certainly, in this study, for those pregnant in 2009, it was the identification of their specific vulnerability (to H1N1) that was pivotal in shaping ensuing behavioural change and a particular vigilance to the normative context of other mothers to be (see Lohm et al., 2014 for more details on this population). Other participant groups already regulated by biomedicine (e.g. the HIV-positive people and those with respiratory illness) were in general compliant with public health advice. The findings also highlight, the role of gender, ethnicity, poverty and other inequalities in shaping both the ability and capacity to act and the meanings of PIB. If, for example, much of the personal hygiene associated with PIB (or equally ‘care’ for the family unit or infected person) is constructed as ‘women’s work’, arguably, public health interventions promoting

pandemic influenza health behaviours will place unfair burden on women or collude with such gender inequalities and target interventions by gender. Equally, constructions of pandemic influenza that culturally, or ethnically, ‘other’ the pandemic may well bolster perceptions of invulnerability at numerous levels (ethnic differences also figure in Rubin et al., 2009). Our analysis also presented examples of creative, agential responses to pandemic influenza which highlighted the individual embedded within social units with clear local rules of conduct, all of which influenced the implementation of risk reduction (familial or occupational action plans of both the formal and informal kinds). The genesis, transferability, implementation and effectiveness of such collectively negotiated plans in generating and maintaining health behaviours and local health cultures demand further attention.

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## Note

1. 'Fair dinkum' translates as honest or genuine.

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