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Living Under the Dome: Individual Strategies Against Air Pollution in Beijing

Abstract

Although poor air quality has been a fact of life for millions of Chinese citizens for at least two decades, individual actions to alleviate the impact of air pollution are a more recent phenomenon. Anecdotal evidence suggests that individualized responses to environmental risks and threats, which Andrew Szasz (2007) termed "inverted quarantine," are becoming increasingly common in China. However, there is little indication about how far inverted quarantine prevails. To address this gap, in 2015 we surveyed over 1,000 Beijing residents into strategies for coping with air pollution. The results are partly consistent with other findings in relation to food safety, providing further evidence of the prevalence of inverted quarantine in response to public health risks in contemporary China. Our empirical evidence also shows public skepticism about the efficacy of individualized solutions to ambient air pollution. Without a serious preventive alternative, inverted quarantine is, at best, a temporary expedient.

Introduction

Ambient air pollution remains a serious problem for Chinese cities (Chen et al, 2016). In February 2015, the report *Dangerous Breathing 2: A Study on the Health Effects of Atmospheric PM2.5 in Urban China* was jointly released by Greenpeace and Peking University's School of Public Health (Greenpeace & Peking University School of Public Health, 2015). It calculated that, in 2013, 257,000 people across China's 31 provincial capital cities died prematurely due to PM2.5 pollution. In the same month, former journalist Chai Jing's documentary about the country's air pollution problems *Under the Dome* made headlines across the world. In China it went viral—over 100 million views were recorded within 24 hours of its release, suggesting strong public resonance with Chai Jing's message (Fu, 2015). Reporting on the film's success, *Foreign Policy* commentator Fu Yiqin announced that, "China's National Conversation on Pollution Has Finally Begun" (Fu, 2015). But not much later censors removed the film from the Chinese Internet.

In contrast, air pollution has proven much more difficult to remove. Poor air quality has been a

fact of life for millions of Chinese citizens for at least two decades. Studies by the World Bank, WHO and the Chinese Academy of Environmental Planning attributed between 350,000 and 500,000 premature deaths per year in China to outdoor air pollution (Chen, Wang, Ma, & Zhang, 2013). And a 2012 report by the Asian Development Bank revealed that, even before PM2.5 became a mandatory indicator of urban air quality, fewer than 1% of the 500 largest cities in China met the air quality standards recommended by the World Health Organization (WHO), with seven of these cities ranking among the 10 most polluted cities in the world (Zhang & Crooks, 2012). More recently, a WHO report that modelled annual median PM2.5 concentration showed that, in China, only parts of Tibet met its air quality guidelines (WHO, 2016).

Air quality in Beijing has come under particular scrutiny due to its capital city status and through its hosting of major international events such as the 2008 Olympic Games and the 2014 APEC Summit. Air quality improved dramatically for both of these events thanks to stringent short-term administrative measures that included the temporary closure of polluting factories in neighboring Hebei Province and restrictions on private car use (Mol, 2010). However, these improvements were short-lived. For example, after enjoying the “APEC blue” effect during the 2014 Summit, Beijing residents were once again condemned to living “under the dome” after delegates returned home. To extend Premier Li Keqiang’s metaphor (in 2014 his government “declared war” on pollution), Beijing residents have become accustomed to waging an “anti-haze war” on an almost daily basis. In December of 2015, Beijing authorities issued the city’s first ever “red alert,” the highest warning level emergency response measure to control heavy air pollution, which resulted in school closures and limits on construction work (The Independent, 2015).

Air pollution has become deeply embedded in the public consciousness. For example, Beijing’s air pollution unexpectedly became a key talking point of President Xi Jinping’s apparently impromptu stroll in the Beijing neighborhood of Nanluoguxiang in February 2014. Public and media discussion focused on Xi’s decision not to wear a facemask, even though the air quality index exceeded 500 and which therefore indicated severe pollution. For some

commentators, this represented his solidarity with the common people who face poor air quality on an almost daily basis. For example, state-owned media outlet Xinhua reported the story under the headline “Xi Jinping visits Beijing’s Nanluoguxiang amid the smog: Breathing together, sharing the fate.” Although some netizens echoed this sentiment, others were more cynical—many perceived Xi’s actions as an attempt to play down the severity of air pollution and the government’s failure to address it (Lora-Wainwright, 2014).

Regardless of how one interpreted Xi’s stroll, the interest in his facemask (or lack thereof) points to a highly noticeable recent development in Beijing and other Chinese cities, namely the upsurge in individual responses to environmental and health risks. In many countries, widely felt threats to common goods often result in collective action. In China, opportunities for the public to engage in collective action are tightly controlled (King et al, 2013). The government is worried that protests against air pollution could spread to encompass wider grievances against the one-party system. This was reportedly the main reason why *Under the Dome* was censored, with the authorities apparently taken back by its popularity (Mufson, 2015). This appears to heighten the attractiveness of individualized behavioral and consumption-based strategies to avoid risk. While there is growing anecdotal evidence, up till now little systematic evidence has been collected on how Chinese urban citizens react individually to the deterioration of their quality of life. With this study we aim to provide more systematic information and understanding concerning to what extent and how Chinese urban residents individually change their behavior when collective action is restricted and governments fail to safeguard the quality of public goods. This article focuses on individual responses to ambient air pollution, and ignores exposure to indoor air pollution, which can also result in serious health problems (Smith & Mehta, 2003). In addition, our survey focused on “problem-based” coping mechanisms, whilst acknowledging that these are often interwoven with emotional responses, which “do not involve changing objective situations” (Gallima & Williams, 2014, p. 68). The article is organized as follows. After briefly reviewing the literature on collective and individualized strategies to environmental and health risks and conceptualizing inverted quarantine, we report on a survey of over 1,000 urban residents conducted in April 2015 in Beijing about how they cope with continuing high levels of ambient

air pollution. Subsequently, we interpret the findings and their implications for contemporary air pollution coping and mitigation practices and policies in China.

Collective goods, individualized responses

The conventional idea over five decades of studies in environmental politics and governance is that common goods such as ambient environmental quality can best be safeguarded and even provided through collective arrangements. Initially, state provision was believed to be the preferential arrangement for providing collective goods. More recent discussions (and practices) have pointed to the potential and actual role of a more diverse set of coordinating arrangements in safeguarding environmental goods: market arrangements, community arrangements and various public-private combinations. Different labels have been used in distinct research and theoretical traditions to highlight how conventional (nation)state institutions have lost their monopoly in collective good provisioning, and are complemented and sometimes replaced by a more diverse set of actors and coordinating mechanisms at a variety of levels. Under the notion of "bringing the environmental state back in" there has been a revival in reflections on the role of state arrangements in environmental goods provisioning (Mol, 2007, 2016; Meadowcroft et al. 2016). Yet this does not diminish the diversity of arrangements designed to safeguard collective goods provision.

Failure to safeguard collective goods has often invoked collective actions and protests, and a wide literature has studied the different forms, strategies and effects of new social movements and collective environmental action (Beierle and Cayford, 2002). At the same time, suboptimal or failing collective arrangements in providing collective environmental goods have often stimulated individualized action. We can expect individual responses to environmental and health risk to prevail massively in situations where collective arrangements fail and collective actions against such failure are deemed unsuccessful or impossible.

In North America a wide literature has emerged on individualized actions against environmental risks and threats. Carrier (2008: 46) defines such individual citizen-consumer action an ''anti-politics machine'' and Josée Johnston (2008) interprets it as self-interested

and therefore anti-collective. Andrew Szasz has termed such individualized responses to environmental dangers and threats "inverted quarantine" (Szasz, 2007), a strategy where individual consumers and citizens protect themselves against dangers and threats. Inverted quarantine can take a variety of forms. Sometimes individuals avoid pollution by behavioral changes such as staying indoors. As Chai Jing herself said, "half of the days in 2014, I had to confine my daughter to my home like a prisoner because the air quality in Beijing was so poor… One morning I saw my daughter banging on the window… The day will come when she asks me, 'Why do you keep me here? What is going to hurt me when I go outside?'" (Fu, 2015). Consumption of goods and services designed to help individuals ameliorate public threats is another aspect of inverted quarantine. A new "haze economy" has started to emerge in China. Sales of equipment such as air purifiers, air monitoring equipment and anti-pollution masks have surged. For example, during a recent bout of smog in Beijing approximately 217,000 facemasks were sold within one week (Duggan, 2014), and state media reported panic buying of facemasks during the December 2015 red alert (The Independent, 2015). Other examples include holidays to smog-free destinations—in a marketing strategy implemented in 2014, major Chinese travel agency Ctrip put away 360 million Yuan to subsidize "haze-escape-trips" for tourists from seven cities including Beijing, Tianjin, and Taiyuan—and the huge popularity of mobile phone apps that provide data on air quality. A quintessential example of emerging individualization occurred when Li Guixin, a resident from Shijiazhuang in northern Hebei Province, attempted to sue his local government for failing to curb air pollution. As Anna Lora-Wainwright (2014) observed, "interestingly, he demanded 10,000 *Yuan* (about £1,000) in compensation—for what he spent on face masks, an air purifier and a treadmill to exercise indoors." At face value, this example echoes Szasz's concern that, rather than being a relatively innocuous phenomenon, inverted quarantine is highly problematic because it is based on individual solutions to problems that can only truly be resolved collectively. It is, he argues,

> … a resigned or fatalistic expression of environmentalism. The people who resort to it recognize that there is a problem and are in fact quite distressed by that problem and intent upon doing something about it. Such people, however, are deeply pessimistic about real change, unable to imagine that things can actually improve, and therefore

> fatalistically resigned to it being a dangerous world. The only course of action left to them, they feel, is to try as best they can to shield themselves individually from harm (Szasz 2007, 236–7).

Such individual protective strategies have a class bias, in the sense that not all can equally protect themselves against the poor quality of common goods. Individual strategies mean that—in contrast to Beck's (1986) famous statement—smog is not democratic in its consequences, nor is poor food or drinking water quality. Inverted quarantine strategies have often also a strongly market driven component, especially when this entails individual consumption of protective technologies or products. Private company interests can then strongly push for inverted quarantine strategies of individual consumers. Some have thus interpreted inverted quarantine as part of the wider political economy of environmental industries, a sector developing strongly in China (Liu et al., 2005; UNEP 2014). Prolonging non-collective 'solutions' for endangered collective goods is consistent with a for-profit market logic.

But individualized actions cannot always be defined in terms of inverted quarantine. Ethical consumption or political consumerism are forms of buying behavior that should be regarded as an extension–rather than a quarantine—of people's lifestyle, social networks, civic and political action or social movements (e.g. Connolly and Prothero, 2008; Spaargaren and Mol, 2008; Willis and Schor, 2012), and not only or mainly as individualized action to protect against specific dangers or threats, and thus not as inverted quarantine. For example, the *Chinese Green Consumers Report 2016* published by the Alibaba Group (2016) showed a steady and rapid increase of green consumers, who numbered 65 million by the end of 2015 (or 16% of active online buyers), and who spent money on energy saving, healthy, and environmentally friendly products. Where ethical consumerism relates to or is primarily motivated by personal health (such as in organic food consumption in China; see, for example, Zhang et al., 2015), the distinction becomes less clear.

While in all societies inverted quarantine strategies can be found to some extent in niche

areas (such as bottled water, organic food), they rarely dominate as the main strategy to cope with low ambient air quality. Anecdotal evidence from China's poor ambient air quality in urban centers suggests that inverted quarantine is more than a niche strategy, although there is little indication about the extent to which the population employs inverted quarantine.

Methods

In April 2015 we administered an online questionnaire survey to Beijing residents to determine the extent to which individuals were turning to inverted quarantine strategies to protect themselves against air pollution. The questionnaire was designed and further improved based on an earlier pilot survey that we administered to 20 people. Questions were separated into four sections. The first section concerned personal details including income levels and *hukou* (household registration) status. Section two focused on public perceptions of, and attitudes towards, air pollution in Beijing. This included questions related to how serious a problem respondents viewed air pollution to be. The third section examined the adoption of individualized solutions, including what measures were taken, how effective they were perceived to be, and why respondents decided to take (or refrain from taking) individualized solutions. The fourth section included several questions related to the documentary *Under The Dome*, including whether or not respondents had heard of or seen the movie. Most questions used a five point Likert-scale for answers. The questionnaire was sent to all Beijing residents who voluntarily registered in the database of the survey company (the total population in the database was 1.92 million, of whom nearly 12% were living in Beijing).

We received 1,050 effective responses out of 1,473. Just over half (57 per cent) of respondents were male;65 per cent were between 22 and 30 years old, and 35 per cent were between 31 and 60 years old. The majority of respondents (68 per cent) were educated at university level or higher. This figure is well above the national average, meaning that the surveyed group is not representative of the Chinese population. Although this could be seen as a limitation of the research, our survey contributes to understandings of China's "emerging middle class" (Chen and Qin, 2014)—a demographic group of significant importance to the

CCP—in relation to serious environmental and health risks. Although about 42 per cent were not officially registered Beijing households, more than 65 per cent had lived in Beijing longer than five years. About 88 per cent lived within the city's sixth ring road, breathing air of more or less similar quality. About 77 percent spent more than one hour on commuting daily. Nearly 90 per cent belonged to middle and high-income groups (monthly family income above 5,000 RMB),This sample represented a population that was well educated, active in the labor market and on the Internet, showed exposure to similar air quality, had access to relevant information, and thus had the potential and capability to take either individualized or collective actions.

Results

Ambient air pollution: perceptions and attitudes

Two thirds of Beijing air pollution originates from within the city (one third from coal burning, one third from vehicles, one third from other sources); the remaining third originates outside Beijing. Behavioral and institutional changes of the people living in Beijing would be ultimately crucial for improving the city's air quality. Our survey data show that Beijing residents consider ambient air pollution to be a serious problem that affects their quality of life. Half (54 per cent) of respondents agreed or strongly agreed with the statement "the air pollution here is intolerable," and only 18 per cent of respondents disagreed or strongly disagreed. More than two thirds (68 per cent) agreed or strongly agreed that "smoggy and hazy weather has become a 'new normal'". In contrast, only 15 per cent disagreed or strongly disagreed with this statement. Our findings were largely similar in relation to the statement "my health has been very much affected by air pollution" (see Figure 1).

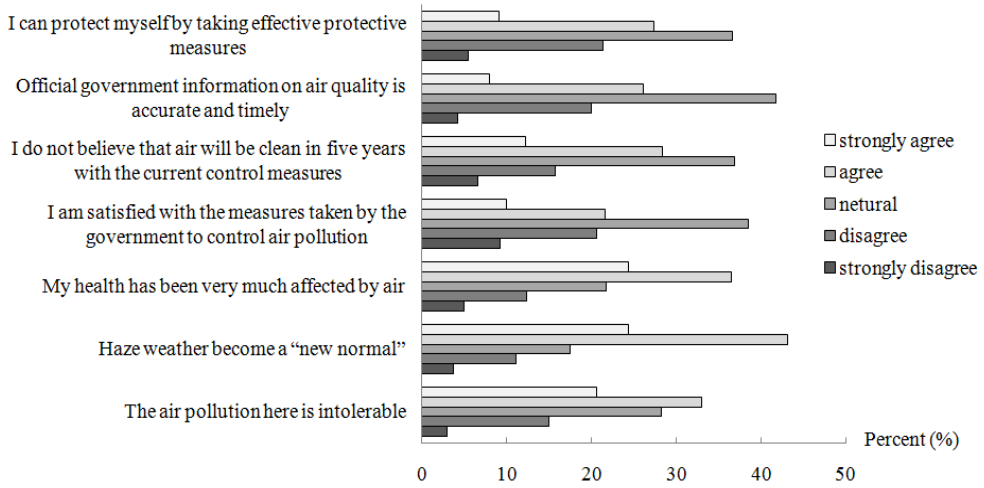

Figure 1 Perceptions of and attitudes towards ambient air pollution in Beijing (N=1050)

Respondents were fairly evenly divided in how they assessed the effectiveness of (government) measures to tackle air pollution (Figure 1). One third (32 per cent) of those surveyed agreed or strongly agreed with the statement "I am satisfied with the measures taken by the government to control air pollution", 30 per cent disagreed or strongly disagreed, and 38 per cent was neutral. Our results showed that respondents were relatively pessimistic about the prospects for addressing ambient air pollution in the near future: 41 per cent agreed or strongly agreed with the statement "I do not believe that current air pollution control measures will result in clean air five years from now". Around one third (34 per cent) of respondents were satisfied with the accuracy and timeliness of publicly available government information on air quality, with around a quarter (24 per cent) expressing the opposite opinion.

Individualized solutions to counter ambient air pollution

Interestingly, about 75 per cent (N=1050) had heard about the documentary film *Under the Dome*, and 74 per cent (N=782) had viewed the film completely. Less than 2 per cent (N=574) stated that the film did not affect their behavior. The rest either took individual protective measures (28 per cent), reduced self-produced emissions (24 per cent), or joined collective actions (45 per cent). In this section we focus on the first two categories.

Respondents were divided when it came to the statement "I can protect myself [against air pollution] by taking effective protective measures." More than one-third (36 per cent) agreed

or strongly agreed; 27 per cent disagreed or strongly disagreed; and 37 per cent expressed a neutral position. Despite this ambivalence among the Beijing population, the vast majority of the respondents (853 or over 80 per cent of the 1050 respondents) answered “yes” to the question “have you taken any individual steps to protect yourself against air pollution?”

Figure 2 shows the range of measures respondents took to protect themselves and their families against air pollution. The most common measure was the use of air purifiers at home—over 60 per cent of the 853 who had taken individual protection measures did so. Almost the same number of people admitted to increasing the number of green plants at home to guard against pollution. This suggests that respondents put greater effort into protecting themselves in their home environments, over which they have greater control. Individual coping measures outside the home were less common, with 38 and 34 per cent of respondents choosing to protect themselves through wearing gloves and facemasks, respectively.

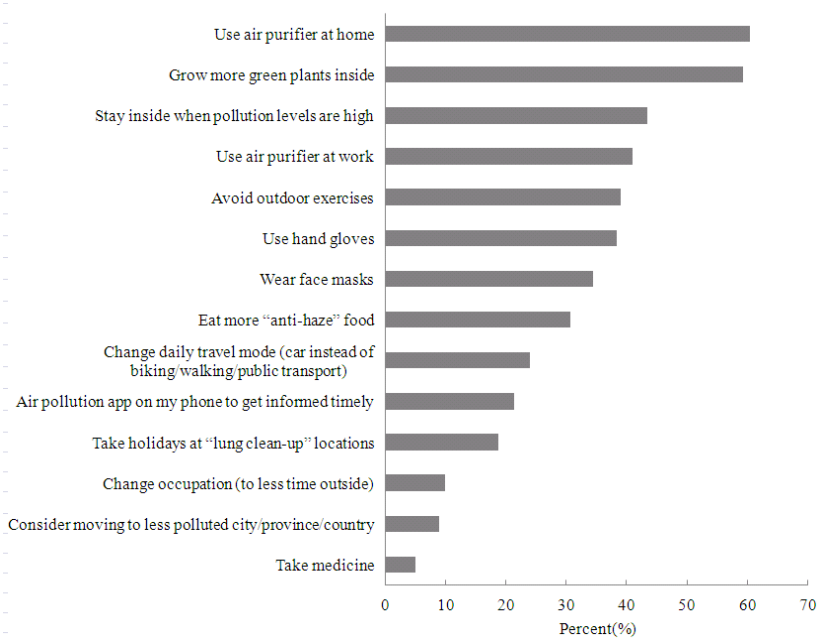

Figure 2 Self –protecting measures taken by individuals (N=853)

The results for behavioral changes were mixed. Unsurprisingly, few respondents admitted to changing their occupation to reduce the impact of air pollution (e.g. from outdoor to indoor; reduce commuting time), and only 9 per cent claimed to have considered moving to a less

polluted location. These changes involve significant upheaval and, potentially, monetary cost. Thus, an “exit strategy” is much more difficult to implement in response to air pollution than it is, for example, in relation to food safety issues where consumers can switch to alternative products, such as bottled water, with ease. In contrast, a relatively high number of respondents had adopted low cost behavioral changes, for example by choosing to stay at home when pollution levels were high (43 per cent), avoiding outdoor exercise (39 per cent), or changing their daily travel mode to one that exposed them to less air pollution (24 per cent).

Spending levels on self-protection measures were substantial. Most respondents (43 per cent) had spent between 500 and 1,000 RMB in the past two years, 30 per cent had spent between 1,000 and 5,000 RMB and 8 per cent spent over 5,000 RMB. 19 per cent of the survey participants spent less than 500 RMB. As a reference, the average annual income in Beijing in 2014 was 43,910 RMB, according to the 2015 edition of the *Beijing Statistics Yearbook*.

Beijing dwellers based their decisions to adopt inverted quarantine strategies on information from a variety of sources. Figure 3 shows answers to the question “why have you taken action to protect yourself or others against air pollution?” The most common response was “following information from the media” (55 per cent), closely followed by “following information from other people” (54 per cent), from the government (45 per cent) and following personal perceptions (45 per cent). Only 27 per cent of the respondents claimed to have been influenced by advertisements.

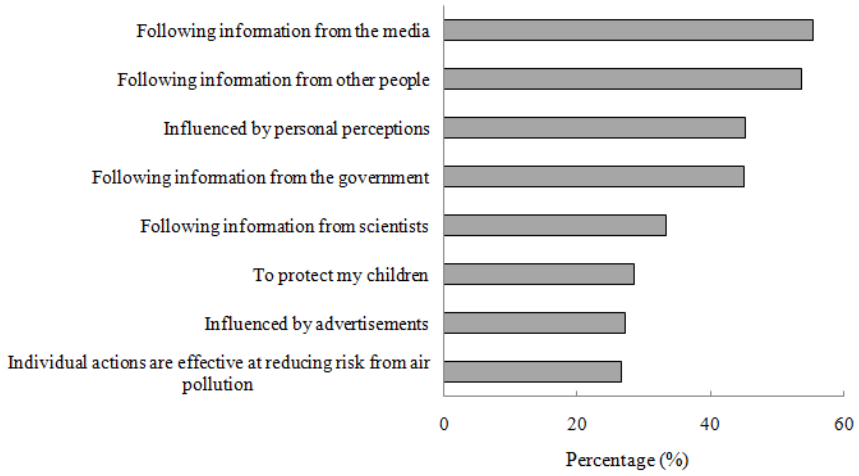

Figure 3 Reasons for taking protective actions (N=853)

Regarding the factors that may affect an individual's adoption of a specific protective measure, Pearson Chi-Square Tests show that age has no correlation with taking any of the measures in this sample (N=1050), but types of occupation (P=0.005), level of education (P=0.004), Beijing household registration (P<0.001), family income (P<0.01), school children (P<0.001) and pregnancy (P<0.01) are significantly correlated.[1] Those who have Beijing household registration (P<0.01), have lived in Beijing for a longer time (P<0.05), have higher income (P<0.05) and have school children (P<0.05) are more likely to install air purifiers at home. Family income is highly significant for taking holidays (P<0.001).

Perceived effectiveness of individualized solutions to counter ambient air pollution

We asked those survey participants who had adopted specific self-protecting measures to evaluate each measure using a five-point scale, with 1 indicating they were "not effective at all" and 5 indicating they were "highly effective." The results are shown in Figure 4.

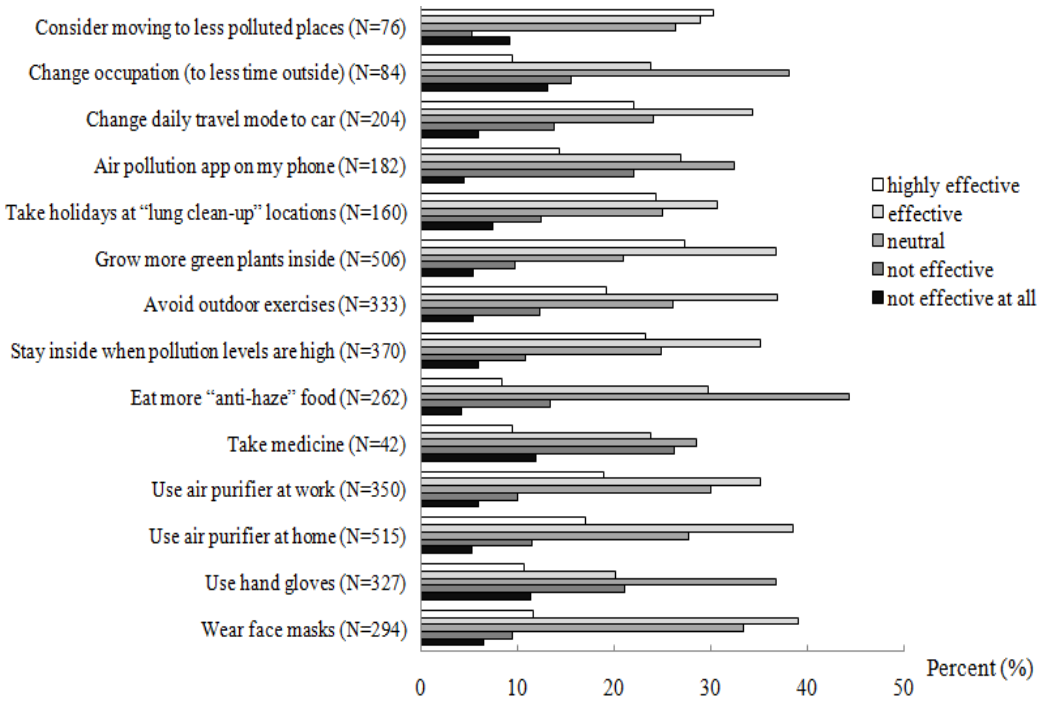

Figure 4 Perceived effectiveness of self-protecting measures (N=853)

[1] *** P<0.001 (2-tailed), ** P< 0.01 (2-tailed), *P< 0.05 (2-tailed).

As Figure 4 shows, respondents who had adopted individualized measures against air pollution were relatively optimistic about the effectiveness of these measures. If we take scores of 4 and 5 to indicate “effectiveness,” more than half of the respondents believed that the following measures are effective: wearing facemasks, using air purifiers at home and work, staying inside when ambient air pollution levels are high, avoiding outdoor exercise, increasing the number of green plants at home, holidaying at “lung cleanup” locations, changing daily travel modes, and considering moving to another location.

The measures perceived to be more effective are not always the more popular ones. Largely depending on the feasibility, an “exit strategy”, though perceived effective, is rarely adopted. At the same time, a fairly high degree of skepticism is revealed from those who had adopted individualized measures. For example, 44 per cent of respondents who had used air purifiers at home (the most common solution among those surveyed) rated them not effective or neutral. Similar results were found for other measures surveyed, including wearing facemasks (49 per cent), staying inside when pollution levels are high (42 per cent), and growing more green plants inside (36 per cent). In other words, although many citizens believed the measure adopted was effective, a significant minority in each specific group remained skeptical towards the adopted measure.

We also asked “if you did not take a particular protective measures can you say why?” We allowed respondents to choose between answers “expensive,” “unrealistic,” “useless,” and “air pollution is not a problem for me” For each measure. Figure 5 shows the results.

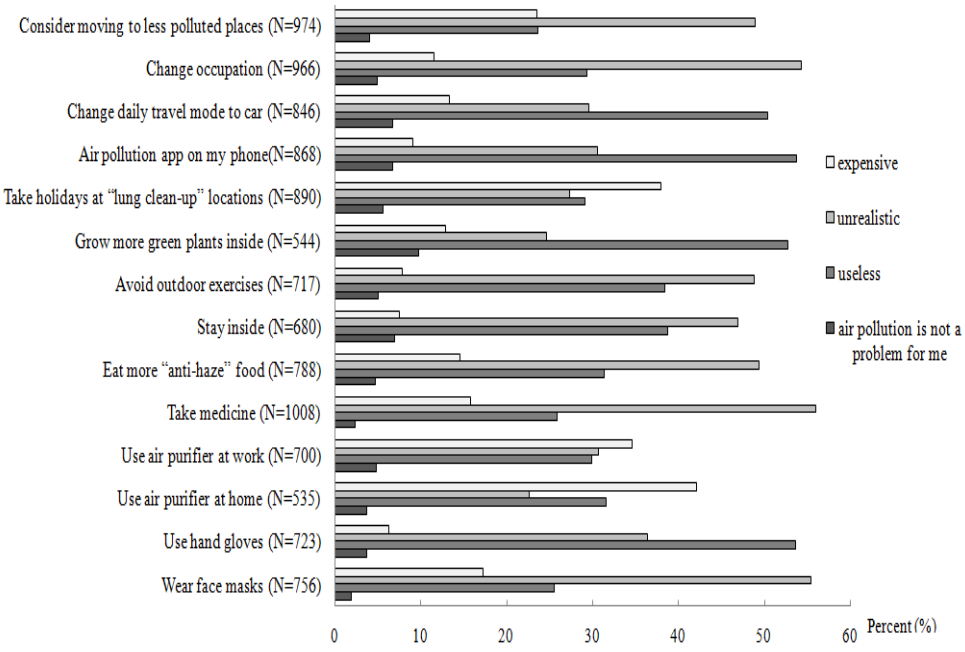

Figure 5 Reasons for not taking self-protecting measures (N=1050)

Collective action against air pollution and actions to reduce own contribution to the problem

Almost three quarters of respondents claimed to have participated in collective actions (broadly defined) against air pollution. The most common form of action was to criticize air pollution policies online, with 46 per cent of respondents having done so. In addition, almost one third (31 per cent) had participated in collective petitions to the government concerning air pollution. Only 28 per cent of respondents had not participated in any form of collective action against air pollution.

To the question "Have you taken any of the following actions to reduce your own impact on air pollution?", more than half of the respondents indicated the use of alternative modes of transportation instead of private car and the use of solar water heater and energy-saving light bulbs, followed by adapting in-house behavior to reduce energy use (44 percent),replacing old, energy inefficient equipment with newer, energy efficient equipment (such as air conditioner, fridge, microwave, TV etc.) (42 percent), installing double windows, not using fireworks during festivals (41 percent), and installing more insulation (40 percent). Those who have indoor job plus daily commuting time longer than one hour, higher education, higher income and who have lived longer in Beijing are more likely to make individual

petitions/complaints (P<0.001) to the government or join collective petitions (P<0.001). Men (P<0.01), those with higher education (P<0.001), school children (P<0.01), and pregnancy at home (P<0.001) tended to join public protest. Those who have lived in Beijing longer (P<0.001) and have higher family income (P<0.001) tend to replace old, energy inefficient equipment with newer, energy efficient equipment. The same group also tend to install double windows or more insulation. When it comes to the question "adapt in-house behavior to reduce energy use", women are more willing to adapt than men (P<0.01). Women (P<0.01), those with higher education, working indoors, and Beijing households with school children are more supportive of stopping using fireworks during festivals (P<0.001).

This suggests that inverted quarantine is not necessarily viewed as an alternative to collective action and behavioral changes. In other words, citizens are not passive when it comes to air pollution, and actions are not only rooted in apolitical individualized approaches. At the same time, inverted quarantine might be seen as a more realistic strategy in a context where political opportunity for collective action is highly restricted and it takes time to experience improvement even when policy measures are implemented.

Discussion and Conclusion

Our survey reveals that Beijing residents display high levels of concern about the human health impact of the city's air pollution, and that individualized solutions to ambient air pollution in Beijing have become widespread amid pessimism about the prospects for improved air quality in the near future. As a result, many have taken steps to protect themselves against air pollution. This is consistent with other scholars' findings in relation to Chinese food safety, and is evidence of an apparently growing trend towards inverted quarantine as a response to public health risks in China (Hanser & Li, 2015; Klein, 2013; Zhang et al., 2015).

What are the potential implications of this? Although individual initiatives to protect against pollution may at first appear relatively benign, such actions may have broader unintended consequences (Szasz, 2007). Most seriously, the "fatalistic" pursuit of individual solutions to

collective problems—and the instilling of a "false sense of security" that can result—undermines social mobilization aimed at addressing the root cause of pollution (Szasz, 2007). Individual actions to mitigate the impact of air pollution are no substitute for efforts aimed at improving air quality. As Künzli, Rapp, & Perez (2014, p. 218) conclude, "in contrast to strategies that tackle the environmental problem and exposure *per se*, preventive action at the individual level will remain limited, costly and ultimately inefficient". And, bemoaning the "individualization of responsibility" for environmental protection, whereby citizens are encouraged to pursue green consumption to help save the planet instead of calling for more fundamental social and political change, Michael Maniates, (2001, p. 33) writes, "when responsibility for environmental problems is individualized, there is little room to ponder institutions, the nature and exercise of political power, or ways of collectively changing the distribution of power and influence in society—to, in other words, "think institutionally"".

However, there is no simple correlation between high prevalence of individualized solutions to poor air quality in Beijing and public apathy concerning the problem of air pollution. This is partly because, as our survey shows, Chinese citizens regard inverted quarantine as a partial solution at best to this problem. Our survey detected high levels of skepticism, and confusion, regarding the efficacy of individualized solutions. That people still persisted with these "solutions" suggests a degree of helplessness to take collective action that tackles the root cause of the problem. Yet it would be wrong to conclude that collective action to tackle air pollution is absent in China. In 2011, in what was dubbed an "airpocalypse" due to particularly wretched air quality, thousands of people used the Internet to successfully petition the authorities to release real-time data concerning PM 2.5 levels. The environmental NGO Green Beagle has run a campaign in which members were loaned equipment to measure PM 2.5 levels before uploading the results to the Internet (Xu, 2014; Zhang & Barr, 2013). And even Li Guixin admitted that his real goal in suing the Shijiazhuang authorities was to raise public awareness around air pollution (Lora-Wainwright, 2014). Individualized solutions against air pollution provide only a partial form (or, more worryingly, a partial illusion) of citizens' actions against environmental threats when it is not possible to walk away from the problem. In China, we should not be too worried that inverted quarantine masks the need for

addressing the root causes, or masks the responsibility people put on the shoulders of authorities. As previous studies have shown, localized public protest in response to environmental concerns in China is widespread, particularly in response to unwanted infrastructure projects (Sun et al, 2016; He et al, 2016). Sometimes individualized solutions even strengthen collective action, blurring the boundary between the two. For example, products such as individual air quality monitors enable individuals to gauge local air quality, and potentially undermine the state's control of information. This could provide the basis for collective action, and pressurize officials to improve the accuracy of their own air quality data.

If, as Szasz (2007) argues, inverted quarantine turns citizens into consumers rather than political actors, then there is clearly a class dimension at play, with wealthier citizens able to "consume" at a higher level than their poorer neighbors. Yet the relationship between class and inverted quarantine is complex. The cost of equipment such as air purifiers varies tremendously. Some models of air purifier cost less than 100 RMB, whilst others exceed 10,000 RMB. Relations between costs and effective purifications are unclear and certainly not linear; and information on that comes from multiple sources, with often conflicting conclusions and lack of accessible independent verification. Indeed, consumers face a myriad of confusing and conflicting information when it comes to deciding which products and strategies are most effective. Fake information, lack of knowledge, a wide variety of products and services, and clear business interests have created a "haze" economy in more than one sense of the word. Indeed, a growing "haze economy" stimulates the emergence of private sector actors with an incentive to sow panic among citizens by providing apocalyptic information concerning the problem, confusing citizens about the effectiveness of certain measures, and prolong individualized coping strategies of inverted quarantine.[2]

The Chinese central government is acutely aware of public dissatisfaction over air quality and has repeatedly reasserted its commitment to tackling air pollution. The *12th Five-Year Plan on*

Air Pollution Prevention and Control in Key Regions contains ambitious targets to reduce the ambient concentration of various pollutants. And the National Action Plan on Air Pollution Prevention and Control (2013–17) set strict targets for reducing PM 2.5 levels. By late 2015, when the provincial level people's congresses and political consultative conferences takes place, air pollution control is being written in all the local work plans and the provincial 13th Five Year Plans as a priority. Authoritarian regimes are more brittle than democracies, and often feel vulnerable to mass-based political movements. Although there is no suggestion that air pollution will stimulate opposition to the CCP, the current regime has proven responsive to public pressure concerning environmental and health risks, particularly when social stability appears under threat (Van Rooij, 2012). Although some scholars view localized, non-regime threatening protest as a safety valve that can strengthen CCP hegemony (Chen, 2012), one potential concern related to desperate yet ineffective inverted quarantine measures is that public dissatisfaction might one day erupt into serious public discontent.

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