

Response towards disease outbreak: perceptions of the key health care staff

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Citation

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Abstract

To understand health care workers' perceptions towards a disease outbreak, a survey was conducted in 5 districts of Karnataka, India between August 2009 and December 2009, to understand the factors that may influence their ability and willingness to report to duty in such an event. The data suggest that nearly half of health care workers are not likely to report to duty during an outbreak. The stated likelihood of reporting to duty was significantly greater for clinical than technical and support staff, and perception of the importance of one's role in the district's overall response was the single most influential factor associated with willingness to report for work. The perceived risk among the health care workers was shown to be associated with several factors peripheral to the actual hazard of this event. Lacunae in knowledge identified serve as barriers to outbreak response and must be specifically addressed to enable effective local public health response to this significant threat.

INTRODUCTION

The health and the medical education departments are considered the backbone of public health response plans for any and all disease outbreaks and emergencies. Emerging Infectious disease outbreaks are considered increasingly likely, and are now considered one of the most significant and urgent threats to India's public health preparedness infrastructure. The threat of emerging infectious diseases is a product of the globalization process. Changing lifestyles, patterns of behaviour and several such complex factors have led to the emergence and spread of disease in India. Outbreaks of diseases like SARS, Japanese encephalitis, dengue, chickungunya, malaria, bird flu, etc., in recent times, have critically influenced human lives in India. Added to this, is the recent pandemic of swine flu. A deliberate or a natural outbreak of disease would force the target state to mobilize the government machinery, human and financial resources while combating the disease [1].

The recent outbreak of swine flu in India has brought to light deficiencies that exist regarding disease preparedness, prevention and lifestyle in India. The numbers of cases have been on a rise since May 2009 and many people have been affected [2]. Successful containment relies on effective system for outbreak detection, rapid data collection, analysis, assessment and timely reporting [3]. These activities would require an extensive prompt response by local health

departments. Previous studies have shown that during extreme scenarios, a varying proportion of healthcare workers may be unable or unwilling to report to duty [4-6]. This may be even truer for health departments, where unlike more "traditional" first responder agencies (such as law enforcement, fire services, and emergency medical services), the capacity and willingness to respond immediately and round the clock to crises is not historically ingrained in the workforces' professional cultures and training. Data from even the developed countries like the United States indicate inconsistent and sometimes slow after-hours response by health departments to urgent events involving communicable disease [7].

Risk perception theory provides a revealing framework for better understanding response limitations and needs of the public health workforce. The perceived risk, according to this theory, is a multifactorial phenomenon, involving the summation of actual risk and other peripheral influences independent of the actual risk, such as perceived authority, trust, and situational control; these peripheral influences have been termed "outrage"[8] or "dread."[9]. Based on these models, it was previously suggested that contributing factors peripheral to the actual risk will have a considerable practical impact on how the health care employees would respond in a crisis[10].

Aside from physical and circumstantial barriers such as

availability of transportation or dependency of family members, specific risk perception issues whose impact may be markedly high and of unique importance for the public health workforce's response to a crisis were identified. These factors arise from a number of features previously suggested to have been associated with elevated risk perception, including manageability of the threat; risk to future generations; direct personal impact; and sense of control over events.

Based on these factors, several major barriers to effective health workforce emergency response were suggested; these include uncertainty regarding working environment safety, unclear expectations of role-specific emergency response requirements, safety and well being of family members, inadequate emphasis on the critical value of each employee to the district's response efforts, and insufficient emphasis on stress management techniques – all of which may heighten employees' sense of dread due to a lack of personal control[10]

So we decided to assess health care personnel's risk perception and likelihood of reporting to duty during a local disease outbreak, and to uncover the variables that affect these outcomes, thus providing a needed evidence base for health departments' planning and training efforts.

METHODOLOGY

We conducted the study in 5 districts of Karnataka, India namely Shimoga, Chitradurga, Tumkur, Hassan and Kolar between August 2009 and December 2009. All the key health care personnel were identified both from the Health and Medical Education in these districts. Self-administered anonymous survey questionnaires were sent to all the identified personnel by us through proper channels. Completed questionnaires were directly mailed to the chief investigator at the government medical college, Shimoga.

The questionnaire included questions on personal characteristics such as age, sex and job classification. Questions were typed in the local language (Kannada) as well for getting accurate responses from the support staff. The health care personnel used a 5-point Likert scale for questions pertaining to a possible disease outbreak in the locality: probability of them reporting to work (“very likely” to “not at all likely”); possibility of being asked by their superiors to respond to an emergency (“very likely” to “not at all likely”); how knowledgeable they thought they were about the potential public health impact of a serious outbreak (“very knowledgeable” to “not at all knowledgeable”); how

confident they were about being safe in their work roles (“very confident” to “not at all confident”); how likely was their family prepared to function in their absence (“very likely” to “not at all likely”); how likely they felt their department would provide them with timely updates (“very likely” to “not at all likely”); how familiar they were with their role specific response requirements (“very familiar” to “not at all familiar”); how well they thought they could address the questions of the public and media (“very well” to “not at all”); how significant a role they thought they would play in the overall response (“very significant” to “not at all significant”); how important would be pre-event preparation and training (“very important” to “not at all important”); how important it was for them to have psychological support available during the event (“very important” to “not at all important”); and how important it was for them to have psychological support available after the event (“very important” to “not at all important”)[11].

The job classification variable was categorized into technical/support staff and professional staff. The former included lab technicians, pharmacists, computer operators, data managers and drivers. The professional staff included district health officials, program managers, general duty medical officers, clinical staff in the medical college (e.g., physicians, nurses), public health communicable disease staff, public information staff, and other public health professional staff (e.g., health educators, LHVs, etc)

The responses to the job classification question were categorized as professional and technical/support groups. Questions about likelihood of reporting to work and disease outbreak related attitudes and beliefs were dichotomized into responses with a score two or less, and all other responses. Logistic regression was used to compute Odds Ratios to evaluate the association of demographic variables and attitudes and beliefs with self-described likelihood of reporting to work. Multivariate logistic regression was used to explore associations between attitudes and beliefs related to outbreak preparedness and self-described likelihood of reporting to work. Adjustment for age, sex, and job classification was done. Likewise, bivariate and multivariate (adjusted for age, sex, and job classification) logistic regression models were used to evaluate the association between the various attitudes and beliefs. In order to assess non-response bias, age, sex, and job classification distributions for the respondents and for all health care personnel were compared. SPSS version 14 was used to analyze the data.

RESULTS

The overall response rate was 77% (n=616). The breakup of the responses from the 5 districts is shown in Table-1. Statistically significant difference in age and gender distribution between the respondents and all health department personnel was not found. A small yet statistically significant difference in the proportion of technical/support staff (vs. professional staff) was detected (22.4% vs. 32% in the study group and all personnel respectively, p = 0.003), yet no significant difference in the proportions of professional staff subgroups was detected.

Figure 1

Table 1: Response rates from the districts

District	Eligible respondents	No. responses received	Response rate (%)
Shimoga	171	146	85.38
Chitradurga	144	100	69.44
Tumkur	203	164	80.78
Hassan	159	116	72.95
Kolar	118	90	76.27
Total	795	616	77.48

Of the 606 who responded to the question about their likelihood of reporting during an outbreak related emergency, 326 (53.8%) indicated they would likely report to work during such an emergency. Age and sex did not have an association with likelihood of reporting. Professional staff indicated a higher likelihood of reporting (Multivariate OR: 2.5; CI 1.3–4.7) than technical/support staff (Table -2).

Figure 2

Table 2: Demographic profile of the health care personnel

Likelihood of reporting to duty			
Characteristic	n (%)	Bivariate OR (95% CI)	Multivariate OR (95%CI)
Age (yrs)			
20 - 25	40 (6.6)	Reference	Reference
25 - 30	96 (15.8)	1.2 (0.4–3.4)	0.9 (0.3–2.8)
30 - 35	204 (33.6)	1.3 (0.5–3.3)	0.8 (0.3–2.5)
35 - 40	214 (35.2)	1.3 (0.5–3.3)	0.9 (0.3–2.5)
>40	54 (8.9)	0.9 (0.3–3)	0.5 (0.1–1.9)
Sex			
Female	118 (19.1)	Reference	Reference
Male	498 (80.9)	0.7 (0.4–1.4)	0.6 (0.3–1.2)
Job			
Technical/Support Staff	138 (22.4)	Reference	Reference
Public Health Officials	14 (2.3)	2.6 (0.5–14.2)	1.9 (0.3–11)
General Duty Medical Officers	204 (33.1)	2.3 (1.2–4.4)	2.5 (1.3–4.7)
Clinical Staff in medical colleges	78 (12.7)	0.9 (0.4–1.9)	0.6 (0.2–1.4)
Program Managers	24 (3.9)	3.1 (0.8–12.4)	3 (0.7–12.1)
Public Information Staff	16 (2.6)	0.6 (0.2–1.4)	0.4 (0.1–1.9)
Other Public Health Staff	142 (23.1)	0.7 (0.3–1.3)	0.7 (0.3–1.3)

Only 40% of all respondents- 45.1% professional staff and 26.1% technical/support staff – felt it was likely they would be asked by their departments to respond to an outbreak related crisis. Perception of likely to be asked by the department to respond was associated with self-described likelihood of reporting (Multivariate OR: 8.5; 95%; CI 4.6–15.6). Only 33.4% (202) individuals thought of themselves to be knowledgeable about the public health impact of an epidemic (Table -3).

Figure 3

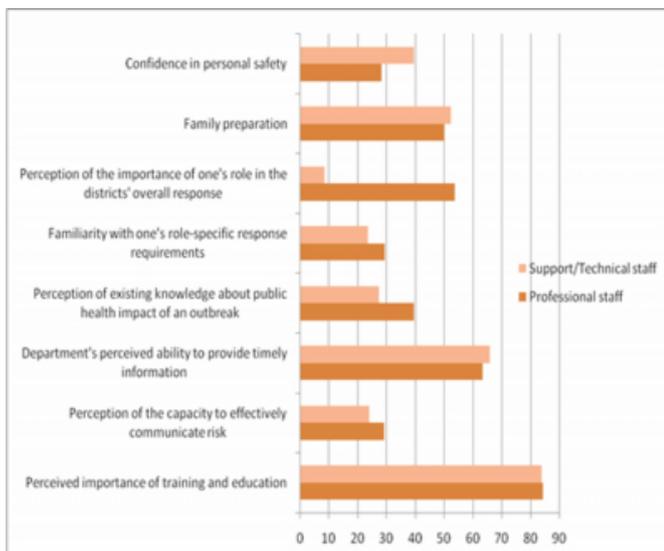
Table 3: Association of perceptions regarding disease outbreak preparedness with projected likelihood of reporting to duty

Characteristic	Construct agreement =n	Bivariate OR (95%CI)	Multivariate Model OR (95%CI)
Perceived importance of training and education	508	3.8 (1.9–7.5)	3.4 (1.6–7.1)
Perception of the capacity to effectively communicate risk	160	7.1 (3.6–13.9)	6.6 (3.2–13.5)
Department's perceived ability to provide timely information	390	2.4 (1.5–3.8)	2.3 (1.3–3.8)
Perception of existing knowledge about public health impact of an outbreak	202	3.5 (2.1–5.9)	3.1 (1.8–5.5)
Familiarity with one's role-specific response requirements	142	7.2 (3.5–14.7)	7.6 (3.4–16.9)
Perception of the importance of one's role in the district's overall response	186	10.4 (5.3–20.3)	9.5 (4.6–19.9)
Family preparation	310	2.4 (1.5–3.8)	2.1 (1.2–3.4)
Confidence in personal safety	200	4.4 (2.6–7.6)	4 (2.2–7.2)

Perception of one's existing knowledge about disease outbreak, and perception of having an important role in the district's overall response were significantly higher among professional staff compared to technical/support staff (Figure -1)

Figure 4

Figure 1: Proportion of individuals who agreed with each of the attitude and belief constructs by staff type



In multivariate analysis, increased self-described likelihood of reporting to work during an influenza pandemic emergency was significantly associated with agreement with several constructs, most notably perception of the capacity to communicate risk effectively, perception of the importance of one's role in the agency's overall response, and familiarity with one's role-specific response requirements in a pandemic influenza related emergency (Table -3)

The vast majority (83%) of the respondents felt they would benefit from additional training activities. A lower perceived level of familiarity with one's role was not significantly associated with a higher perceived need for additional training (Multivariate OR: 1.4; CI 0.6–3.4). Most of the respondents also perceive psychological support during the event (57.1%) and post-event psychological support (61.3%) as important. Psychological support during and after the event was deemed more important by staff who considered themselves likely to be asked to report to duty during an event (Multivariate OR: 2.4; CI 1.4–4.2 and OR: 2.8; CI 1.6–4.8), respectively.

66% of the respondents perceived themselves to be at personal risk when performing their duties during such an event. Confidence in personal safety was associated with several constructs independently of one's job classification, including perception of existing knowledge about public health impact of disease outbreak (Multivariate OR: 4.1; CI 2.3–7.6); family preparation (Multivariate OR: 2.5; CI 1.4–4.3); their department's perceived ability to provide timely information (Multivariate OR: 5.4; CI 2.7–10.7); perception of the capacity to effectively communicate risk (Multivariate OR: 4.8; CI 2.6–9.0); perception of the importance of one's role in the district's overall response (Multivariate OR: 4.1; CI 2.9–7.7); and familiarity with one's role-specific response requirements (Multivariate OR: 3.5; CI 1.8–6.2). The associations between self-identified likelihood of reporting to work and perception of one's capacity to effectively communicate risk were substantially stronger for technical/support staff compared to professional staff (Bivariate OR: 19.4; CI 2.4–160.4 vs. OR: 5.9 CI 2.9–12.2) respectively.

DISCUSSION

WHO is advising countries in the northern hemisphere to prepare for a second wave of pandemic spread. Countries with tropical climates, where the pandemic virus arrived later than elsewhere, also need to prepare for an increasing number of cases. Countries in temperate parts of the

southern hemisphere should remain vigilant. As experience has shown, localized “hot spots” of increasing transmission can continue to occur even when the pandemic has peaked at the national level [12]. Existing plans account for personnel shortages within the healthcare settings. Our data suggest that, nearly half of the local health department workers are likely not to report to duty during such an extreme public health crisis. In fact, most of the workers (and nearly three out of four technical/support workers) do not believe they will even be asked to report to work.

It was found that the willingness to report to duty during an outbreak varies considerably according to the individual's job classification. Clinical staff state they are significantly more likely to report to duty, compared with all other workers. This difference correlates well with the single most influential construct associated with willingness to report to duty – the perception of the importance of one's role in the district's overall response. Less than a third of the respondents believed they will have an important role in the district's response to local outbreaks of an infectious disease, but within this subgroup, willingness to report to duty was as high as 86.8%. Belief in the importance of one's role was lowest among technical/support staff, program, and other non-clinical professional staff (15.1%, 18.4% and 18.8% respectively), groups in which willingness to report was shown to be lowest. Therefore we feel it is important that further efforts must be directed at ensuring that all local public health workers, but most notably non-clinical professional staff, understand in advance the importance of their role during an outbreak – otherwise they will fail to show up when they are most needed.

Lack of knowledge, ambiguity regarding one's exact tasks, and questionable ability in performing one's role as risk communicator were all significantly associated with a higher perceived personal risk and a two- to ten-fold decrease in willingness to report to duty; these factors proved to be more influential even than the perceived level of family preparedness to function in one's absence. It is therefore important to recognize that public health employees, who are intended to serve as purveyors of risk communication for their communities, themselves represent a community with specific perceptions that must be addressed in the context of emergency readiness training. It was only in the last one year; H1N1 strain became increasingly pandemic in Southeast Asia and as lethal infections with the virus occurred in an alarmingly increasing rate among humans, that the urgency of the situation was openly declared by

national and international health authorities. The rapidity of this evolving situation may serve to explain why only one third of the respondents felt they were adequately knowledgeable on outbreaks, and why only one in five respondents felt capable in effectively communicating pandemic risks. Only 2 of the 78 technical/support staff workers who felt incapable of effective risk communication was willing to report to duty, even though most of them believed the health department will have the ability to provide timely information.

The study has some important limitations that must be factored into the overall analysis. First, the sample was limited to five non-randomly selected districts, and all of which have staff sizes under 300. The job classifications do not necessarily map neatly onto functional responsibilities in disaster response. For example, health educators may play as frontline a role as clinical staff, in terms of their degree of interface with the public in a disaster. The lack of significant difference in age and gender distribution, as well as the lack of significant difference in job classification other than technical/support staff indicates that the extent of such a bias in the study is probably limited.

This study show similar patterns to data on the willingness of urban healthcare workers from non-public health settings to respond to emergencies: a survey of 6248 employees from 47 healthcare facilities in the New York City area revealed that these workers were least willing (48%) to report to duty during an untreatable naturally-occurring infectious disease outbreak affecting their facility (SARS), compared to other disaster scenarios [6]. In the face of a pandemic H1N1 influenza threat, local health department employees' unwillingness to report to duty may pose a threat to the nation's emergency response infrastructure. Addressing the specific factors associated with this unwillingness is necessary to help ensure that existing local health department preparedness competencies [13]

CONCLUSION

Most of the health care personnel feel they work under significant personal risk, in a scenario they are not adequately knowledgeable about, performing a role they are not sufficiently trained for, and believing this role does not have a significant impact on the district's overall response. These specific perceptions and needs must be attended, and specific intervention programs must be initiated. In order to reduce the perceived risk associated with the worker's role in a case of a disease outbreak, each worker must have better

understanding of the scenario and importance of his or her personal role within these settings, confidence that the district will provide adequate protective equipment for its employees, psychological support and timely information, and a belief of being well-trained to cope with emergency responsibilities including the ability to communicate risk to others.

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