Social implications of arsenic poisoning in Bangladesh

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Social exclusion and arsenic poisoning in Bangladesh

Abstract

Besides its toxicity, arsenic poisoning creates widespread social problems for its victims and their families. There is, for instance, a tendency to ostracise arsenic-affected people, arsenicosis being thought of as a contagious disease. Within the community, arsenic-affected people are barred from social activities and often face rejection, even by their immediate family members. Women with visible arsenicosis symptoms are unable to get married and some affected housewives are divorced by their husbands. Children with symptoms are not sent to school in an effort to hide the problem.

This paper employs mainly qualitative methods to interpret people's understandings about the toxic impact of arsenic on their social lives. Arsenic-affected patients were asked to determine their 'own priorities' in measuring arsenic toxicity on their social activities and to explore their perceptions about their own survival strategies.

Key words: *Arsenic poisoning, Bangladesh, Social exclusion, Stigma, Liminality*

Introduction

In view of the scale and complexity of the logistical challenges facing health planners and the medical services, an undervalued aspect of disease in Bangladesh has been, understandably perhaps, the non-medical social consequences of ill-health. There has been some work on the dislocation of life associated with leprosy (Withington et al., 2003), infertility (Papreen et al., 2000), and disability (Hosain et al., 2002), but the urgent arsenic crisis in that country has so far attracted little official or academic attention from the point of view of social risk. Nasreen (2001) is one of the few Bangladeshi scholars to have approached it from a social science point of view, and Susan Hanchett (2002, 2004) has also contributed important papers.

The evidence suggests that, far from being nurtured and pitied by their communities, sufferers from arsenic poisoning are shunned to the point of becoming social misfits or outcasts. The stigma is similar to that of leprosy and our research indicates a condition that is threatening and confusing to all concerned, amounting to the ‘spoiled identities’ outlined by Erving Goffman (1968). Known arsenic patients may not feel ill or look ill, other than some skin pigment discolouration, but they are stripped of their status in society and adopt a virtual identity as ‘dangerous’ people. An element of self-policing encourages many to withdraw from society, either because of an incorrect assumption of infectiousness, or because of the embarrassment of difficult encounters with acquaintances, friends and relations. Shame is a powerful element of the isolation that they feel. So discredited are these people that they may be unable to find work or pursue normal social relations such as marriage.

The bodily marks of arsenicosis, arsenic poisoning, are associated in the early stages with the palms of the hands and the soles of the feet. These stigmata are black patches known in Bengali as *zengoo*. At first blisters (*foskaa*), sores (*ghaa*), or *gotta/goottee* (swellings) develop on palms and soles and there is *chulkani* (itching). These *goottee* gradually turn into *zengoo*, which develop slowly. Later the skin becomes dark and spotted due to the deposition of a black pigment. Eventually the spots become thickened (*mota*) and hard (*shokto*), the worst prognosis being a cancerous gangrene (Zaman, 2001). Arsenicosis also affects other parts of the body, including the central nervous system, the heart and blood vessels, and causes a range of internal cancers, particularly affecting the bladder and lung (Gou & Lu, 1994).

Arsenic poisoning is a relatively new phenomenon in Bangladesh and lay knowledge, particularly amongst the non-literate rural poor, is still in the early stages of development. Among the sufferers that we interviewed, their fellow villagers do not seem willing to suspend judgement and arsenicosis has immediately assumed in the popular mind the status of a medical hazard, spreadable by contact. It may be that we have identified only the first, most negative stage in the disease's reputation and in future people may well become more sympathetic in response to health messages by NGOs or the state.[1] Mitigation with various methods of filtering or the use of treated surface water may also defuse the near panic that has gripped villagers in the worst hot spots.

Arsenic-affected people occupy liminal spaces (Turner 1974) in our field area. They are neither healthy, nor are they, most of them, seriously ill or hospitalized. They therefore live on the margins of social life, often afraid to leave their own homes. Even the domestic haven is denied to some, with the disruption of family life being a typical outcome.

The present paper seeks to achieve three objectives. First, we explore the social impacts of arsenic poisoning upon people's daily lives, especially the increasing distance they experience from their friends and families in terms of interaction and intimacy. Second, we outline the survival strategies adopted by sufferers, classified into what we call ‘coping strategies’ and ‘adaptation strategies’. Third, we consider social hazards and possible means of redress. At present these are more hypothetical than real but they deserve an airing. The originality of the paper lies, first, in its exploration of evidence from detailed fieldwork in the district of Satkhira (Hassan 2003). Second, we dwell upon the voices of rural patients rather than the opinions of experts, with the result that there is less technical language than in much of the environmental science literature on the problem of arsenic, but our claim is that our approach is justified because neglecting the experiences and opinions of the people is a mistake and is likely to lead to misinformed policy-making. Third, our fieldwork employed qualitative methodologies and we take some time to highlight these to the reader. Surprisingly little effort has been made so far to use these valuable techniques in the medical geography of Bangladesh.

The arsenic hazard in Bangladesh

In this section we will first outline the nature of the groundwater poisoning problem and then go on to explore the liminality of poisoned spaces through the words of the sufferers. As if its high rates of mortality and morbidity from infectious diseases were not enough, particularly amongst infants and children, Bangladesh has, in the last ten years, been identified as the locus of one of the greatest current environmental health problems in the world. 28-35 million people are exposed to toxic levels of arsenic in drinking water (BGS/DPHE 2001) and, although there has been scientific research on the origins and mitigation of the poisoning, general solutions are still a long way off.

The recent detection of high arsenic concentrations in tubewells in Bangladesh has added a new dimension to the country's existing environmental challenge of floods and cyclones (Hassan et al., 2003). The social consequences of this are far-reaching and tragic (Hassan, 2003). A large number of rural people, due to a lack of access to technical information, consider arsenicosis to be a 'curse of nature' (Hassan, 2000). Although arsenic is a known carcinogen, its impact on patients' social lives is a further, painful burden to bear.

Serious arsenic contamination of groundwater was confirmed in 1993 by the Department of Public Health Engineering (DPHE) in Chapai Nawabganj along the western border with India. It is the result of the geochemistry of the aquifers in the Holocene deltaic sediments and was inadvertently tapped in a nationwide project, funded since 1972 by the UNICEF, to provide clean and conveniently located drinking water through the drilling of millions of shallow tubewells. In the last ten years the known contaminated spaces have increased at an alarming rate and it seems that the hazard is present across vast swathes of the country, with only the Chittagong Hill Tracts in the south east escaping completely. We ourselves tested 375 tubewells and found that 371 of them are unsafe according to the WHO standard (0.01 mg/l) and 358 at the lower Bangladesh standard (0.05 mg/l)(Hassan et al., 2003). Nationwide, 1.2 million people already have identifiable symptoms of arsenicosis (Karim, 2000). Since arsenic poisoning develops over periods of time as long as 20-30 years, it seems likely that a future peak of cases is inevitable.

The wider world is implicated in this disaster. It was international aid money that assisted the first spread of tubewells, with the best of intentions. The original idea was to circumvent the heavily contaminated pond and river water that rural people had traditionally relied upon, but certain strata of the quaternary sediments comprising the surface geology of much of the country were themselves contaminated with metalloids injurious to health. Now a variety of state agencies and NGOs are searching for the optimum mitigation strategies, to reduce the risk from drinking poisoned groundwater and to find safer alternatives (Caldwell et al., 2003).

The field area

Bangladesh is a poor country with an average income per capita of $400 in 2003. The population of about 140 million has a literacy rate of only 41.1 per cent amongst those over 15 years of age and a life expectancy of 62 years. It scores lower on most indices of development than its neighbour India. The data for this study were collected in 2001 in Ghona Union, Satkhira District in the south west near to the border with India. The study area comprises five *mauzas* (the lowest level administrative territorial unit) and nine administrative wards (area 17.26 km^2), with a population 13,287 in 1991 (BBS, 1993). It is characterised by levels of literacy and income below the national average, and an economy that is dominated (82 per cent of employment) by a traditional, low-tech agrarian economy producing principally rice, vegetables, jute, milk and shrimps. Transport links are poor and all levels of health care and educational provision are modest. Only 5 per cent of households have electricity (BBS 1993). Although it is physiographically part of the Ganges alluvial and tidal plains, the study area has not been in the front line of environmental catastrophe in Bangladesh, suffering only one major flood (2000) in recent times.

Ghona Union is very badly affected by arsenic, with water from 99 per cent of tubewells contaminated at the WHO standard. This shocking revelation indicates that, potentially, there will be many arsenicosis sufferers but, as yet, few patients have been identified in the study area. This is probably because, first, the local medical services have yet to gear up for diagnosis and, second, because in the dry season many of the shallow tubewells dry up and people are forced to switch to the water of deep tubewells (Hassan 2003). These are fewer in number and inconveniently located, but less contaminated

At the time of the fieldwork there had been no other testing of tubewells in Ghona, and the only awareness-raising that had been conducted was an ineffective poster campaign by the DPHE in conjunction with local NGOs. This did not impinge much on the consciousness of the people because they had no knowledge of arsenic and no cases of arsenicosis had yet been diagnosed. The posters advised against using red-painted tubewells when none at that point had been marked either red or green. The advice was duly ignored, thus devaluing the coinage of public information. Our testing of the tubewells and reporting of interpreted results to the owners was the only factual data about their personal situation that most of them had ever received (Hassan 2003).

Qualitative data collection

Medical geography has a long tradition of the quantitative analysis of spatial patterns of disease, blossoming in recent years with the use of Geographical Information Systems. This has facilitated epidemiological modelling and has enhanced our insights into the relationship between environmental factors and human health. We found this methodology helpful in our own work (Hassan et al., 2003). The present paper addresses the rather different departure by medical geographers in the last ten years or so of devising means of collecting and analysing qualitative data. These are used to elicit in-depth material about culture, meanings, processes and problems. In the present study they were employed to educe people’s understandings of the impact of arsenic on their social lives and of the survival strategies they are adopting.

The qualitative 'tool kit' now has many available techniques (Hay, 2000). Our study was designed using 'multiple sources' of data (Figure 1) derived from three methods: participatory rural appraisal (PRA); in-depth interviews; and focus-group discussions. These were employed to explore patients' perceptions about the impact of arsenic on their social lives and their survival strategies.

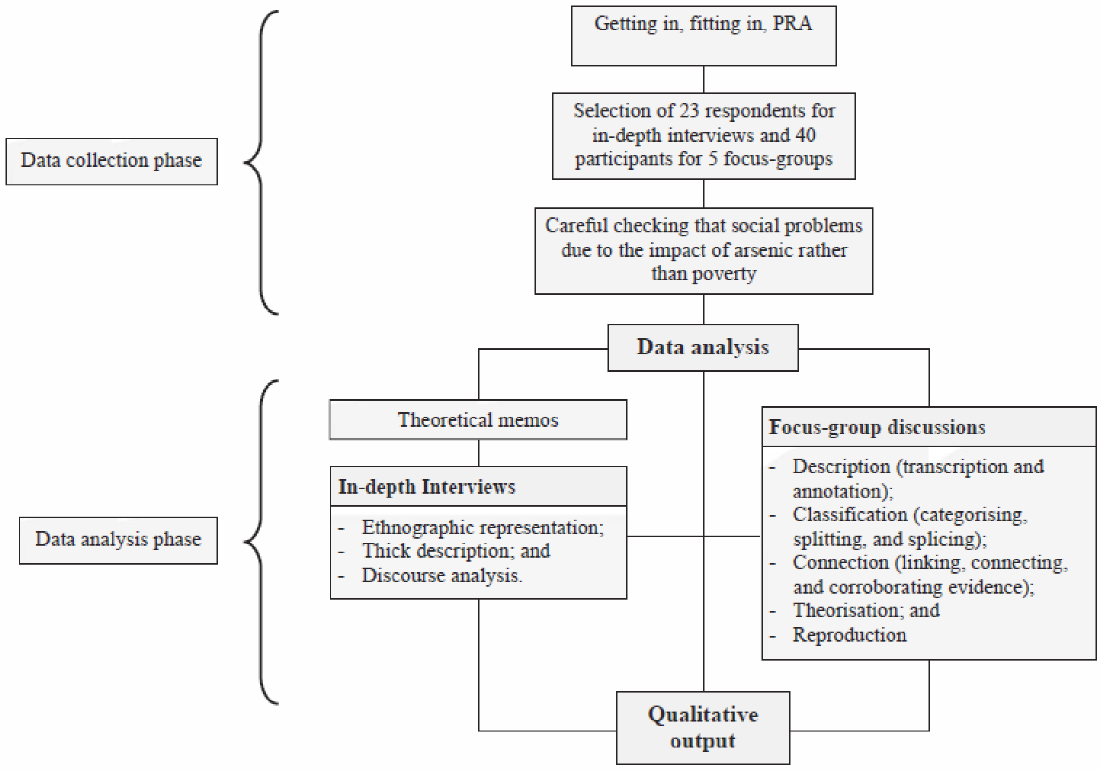

Fig. 1. Flow chart for data collection and analysis.

Rapid appraisal and participatory approaches are useful and effective for exploring rural issues in a rapid and cost-effective manner (Chambers 1992). The methods are used to 'obtain a differentiated understanding of the community's attitudes, beliefs and behaviours' (Mukherjee, 1995) towards an issue or problem. We employed triangulation, reconnaissance surveys, and informal meetings with local people to obtain a preliminary understanding of the arsenic situation in the study area. Epistemologically, this approach was geared to eliciting local understandings. After ‘fitting in’ to the study area, a number of different methods were adopted, both formal and informal, in order to gather data. For instance, each morning, breakfast would be provided for a number of people in the village under scrutiny. This broke the ice and conversation often turned to matters of relevance and importance for the research. In addition, mixing socially with local leaders was productive, for instance playing *caram*, a Bengali board game, with them.

In-depth interviews and focus-group discussions were used to explore people’s own understandings about the impact of arsenic on social issues and subsequent survival strategies. These involved sufferers, non-sufferers, and groups containing different occupations. Interviewing is a highly personal process where meanings are created through personal interaction (Baxter & Eyles, 1999). The in-depth interviews were based upon 26 open questions and these led to long discussions in each interview. Some 23 in-depth interviews were undertaken, of which half were with arsenic-affected patients (Table 1). The non-patients were chosen with a view to representativeness of the various bands of arsenic contamination that had previously been identified in our detailed survey of the tubewells in the area (Hassan 2003). An epidemiologist diagnosed arsenicosis in 11 of the 67 people who had primarily been identified by a village doctor.

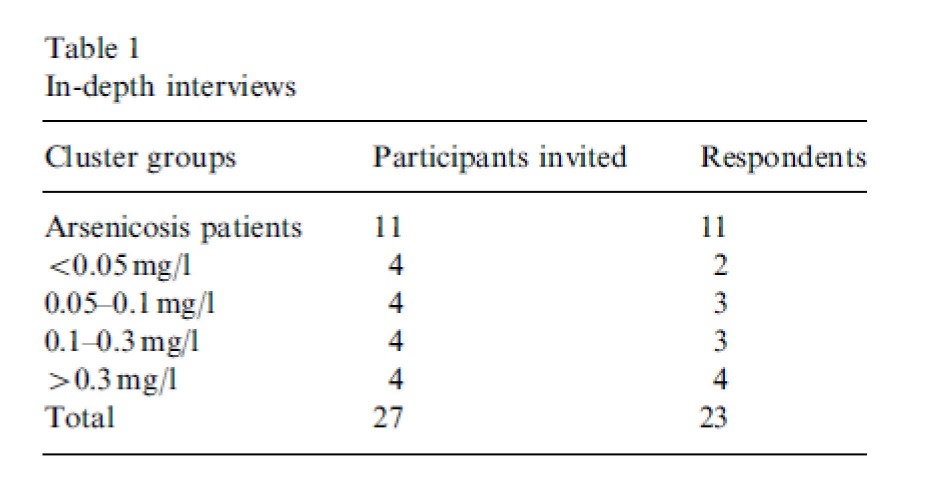

Table 1
In-depth interviews

Cluster groups	Participants invited	Respondents
Arsenicosis patients	11	11
<0.05 mg/l	4	2
0.05–0.1 mg/l	4	3
0.1–0.3 mg/l	4	3
>0.3 mg/l	4	4
Total	27	23

In the focus-groups ‘interaction discussion’ generated ‘rich details of complex experiences and the reasoning behind actions, beliefs, perceptions and attitudes’ (Carey, 1995). This method was adopted in order to observe the debate and negotiation of meanings in a complex area of social concern. After an initial phase of participatory observation, five focus-groups were selected (Table 2), representing the major strands of information and influence identified, and they were asked to deliberate on eight dimensions of the arsenic issue in Ghona (Hassan 2003). All participants were adult males. A number of women were invited to participate in the focus-group discussions, but none were willing due to the conservative nature of the local culture. Nor was it possible for our male fieldworker to facilitate a women-only focus-group.

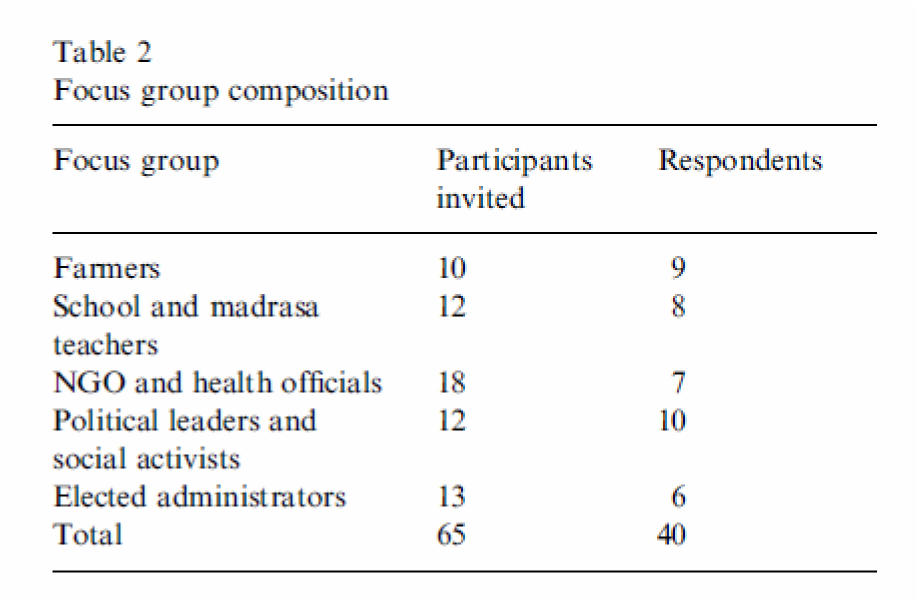

Table 2
Focus group composition

Focus group	Participants invited	Respondents
Farmers	10	9
School and madrasa teachers	12	8
NGO and health officials	18	7
Political leaders and social activists	12	10
Elected administrators	13	6
Total	65	40

In Bangladesh, poor rural people suffer many indignities, humiliations and injustices. During the field survey, care was taken to filter out those social problems that were clearly due to poverty rather than to arsenic poisoning. It is noteworthy, for instance, that some respondents and participants indicated that their problems were principally caused by the flood in 2000.

Findings

Navon & Morag (2004) have referred to liminality as biographical disruption. They were researching adult males undergoing hormonal therapy for advanced prostate cancer and found several disruptive social side-effects of the treatment. Many of their subjects were responding positively to the treatment and were therefore hoping for a return to something approaching normal social interaction with their friends and family. In contrast, arsenic patients in Bangladesh are faced with a total absence of effective medicines and, in some cases, very little choice in the water that they drink. In this section we will discuss their social problems.

Ostracism

If disease appears anywhere in rural Bangladesh, there is a tendency for people of that area to avoid and to isolate the affected people (Tsutsumi et al. 2004; Withington et al. 2003). Within the community, arsenic-affected people are barred from social activities and often face rejection, even by their immediate family members. Although most villagers, at the time of the fieldwork, had little or no knowledge about arsenic, many feared it and assumed the disease to be contagious, even though they were unaware of its symptoms. As a result, some patients experienced social problems due to the visibility of *zengoo* (black spots) on their bodies. These *zengoo* are common among farmers and labourers in the study area.

For instance, Mr Jhilam, an arsenic-affected patient of about 22 years of age, lives with his parents in Mollapara in Ward 1 of Ghona Union.[2] He discontinued his education due to financial constraints and is now working as a farmer and a daily labourer like his father. He ploughs his own land and is a casual labourer in paddy fields of others near Dat-Bhanga Beel. His whole family drink water from highly arsenic-contaminated tubewells located there. He had heard some discussion of arsenic on the radio but did not attach any importance to it since he knew nothing about the subject. He is affected with arsenicosis himself, having had black spots on his feet and hands for six years. He has been to physicians several times for treatment and takes medicines and uses ointments as per their prescriptions, but there is no improvement. Some people no longer talk to him. One of his closest friends said '…please don't come near me; if I touch you then the disease you have got will infect me.' Also, he is marginalised in his own family: '…my parents do not say anything directly, but I can understand their feelings and distance.'

Another seriously arsenic-affected patient (40, male, casual labourer) told us:

> Some people in the *Hatkhola* [periodic market] avoid me indirectly. When I go to any shop for my daily shopping and even to a tea-stall for a cup of tea, some people move away or try to leave. I don't know why do they do this. They will not realise my problems until they get this disease themselves. I am very upset at this situation.

Some unaffected people are angry and aggressive. They think that patients should either stay in their homes or leave the village. One focus-group participant (45, male, political leader) summarized this combination of ignorance, prejudice and fear: 'If anybody is affected with gangrene, who will meet him? Who will go close to him? People will always make a safe distance from arsenic-affected patients because of arsenic panic. Everybody in this village is scared about arsenic.'

Patients complained that some tubewell holders misbehave towards them and do not give them access to their tubewells for collecting water. One was bitter: 'I used to go to a tubewell of Mr X (Tubewell Id-223) for collecting drinking water. When he came to know that I have got skin lesions on my body, he then told me not to collect water from his tubewell. He said that I could spread the disease to other people.' One tubewell holder is reported to have said: 'Don't disrupt us, sink a new tubewell for yourself and tap your water from there'.

Fig. 2. Public deep tubewell (source: Dr. M. M. Hassan).

A respondent at the location of a deep tubewell (Id-337)(Figure 2) commented that ‘this is government-owned. We have the right to access this deep tubewell, but the tubewell-holder and his family members always make problems for us to collect water. What can we do now?’[3] When this issue was raised in a focus-group of elected administrators, the tubewell-holder responded: ‘No, I have never told them not to collect water from my deep tubewell. They always quarrel during the collection of water. They collect water from early morning to midnight and we have to put up with noise from tubewell tapping and shrill unwanted sounds from them.’ He commented that an additional deep tubewell was essential to reduce the pressure on water collection in this vicinity. It is worth noting that a keystone of government policy on public deep tubewells is to place them under the control of paid guardians. Because this gives social leverage to the holder, there is scope for inappropriate use.

Difficulties in daily activities

Some patients said that the difficulty of getting daily work or interruptions to daily labour are major consequences of arsenic poisoning. If an adult is affected with arsenicosis, there are subsequent problems in maintaining income stability, particularly if they are very poor, but sometimes they are the only earning members in their respective families. Most of the patients in the study area are engaged in work either in agriculture or as daily labourers. If they are absent due to sickness, they are not paid for days missed. Some employers check the palms of arsenic-affected patients and refuse to provide *zengoo* sufferers with work. According to one informant (22, male, causual labourer):

> My boss knows my health condition. One day, he told me "you are sick, you are not able to do any work. Go home and take a rest. When you recover then you can come for the work. I will give you the work then."

Talking to affected school children, it was clear that they also faced prejudice. In some cases former friends keep their distance. They do not like to share books and pencils. In addition, teachers may restrict their access to school (Milton et al., 1998). One example is Taslima, aged 10, a girl who developed black spots on her palms and soles and is now having problems at school.

> Nobody sits beside me in school. They do not like to talk with me, and do not share books. Nobody likes to play with me in school. When I play, some children shout "don't touch her, don't play with her, she's got arsenic". I will not go to school.

Some children hide their symptoms, as one girl (aged 13) confided: ‘I’ve got sores on my palms and if I show them or talk about it, my friends will not play with me in school.’ Children with symptoms may not be sent to school in an effort to hide the problem and this situation is a serious impediment to a satisfactory education.

In-family situation

There is an increasing tendency to avoid arsenicosis patients even within families - they are indirectly neglected and isolated. As one man (26, farmer) articulated:

> My parents do not say anything to me directly, but I can understand their feelings and the distance they are making. One day, when I took rest on my bed, my mother asked me, “why are you sleeping so much? Go to your work and earn money for the family”.

Parents feel hesitant about being close to their children, and husbands keep a safe distance from their wives. A father (55, farmer) suffering from arsenicosis for four years said that ‘two of my sons try to avoid me tactfully - they do not like to come close to me. I can understand their situation, but I never let them know about my health problem. It is an appalling situation in a family atmosphere.’ Parvin, 17, a young woman who developed black spots on her palms and skin lesions on her whole body is facing problems in her family. In desperation, she revealed that ‘my parents are rude to me. I have never seen this behaviour before these sores appeared on my body. Probably, I am a burden to this family. I am really upset.’

Women are socially the most vulnerable. Jarina, 31, who developed blisters and black spots on her body, is neglected by her husband. He does not talk frequently to her now, and no longer asks her about her health situation. Some of the literature cites evidence that women with arsenicosis symptoms are unable to get married (Chowdhury, 1997; Haq, 1999; Zaman, 2001) and some affected housewives are divorced by their husbands and even forcibly sent to their parental home with their children (Haq, 1999; Milton et al., 1998). This latter extreme is not yet a major problem in our study area but young women and their parents are certainly aware of the issues:

> What can I do now? My daughter has got blisters on her whole body and it is gradually getting worse. If she does not recover quickly nobody will marry her. If she is in good health, she can help me in my house work. Now she is sick and she cannot do any work (46, male, farmer).

During earlier fieldwork in Marua village, Jessore (June 1999), three wives (out of 37 affected women) were found to have been forced to return to their parents and two had been divorced as a direct or indirect result of their illness (Hassan, 2000).

Almost all of the arsenic-affected patients are leading constrained lives. In fear of such social problems, they feel hesitant about talking of their illness. Some refused to talk to us about their health problems in the presence of others. Others recalled their fear when they first realised that they had arsenicosis. One patient (41, male, mechanic) commented that: ‘I don’t show my hands to people, and I try not to tell my problems to anybody. If people come to know my health condition they will not be cordial with me.’

Arsenic-induced diseases are causing not only social difficulties for poor patients, but also creating serious concern among presently unaffected people.

According to the participants of one focus-group, ‘all of the arsenic-affected patients are thinking about the recovery of their health, but we, the unaffected people, are not in a good situation either. We are worried about arsenic. If arsenic attacks us, we will face health and social problems like the arsenic-affected people.’

Attitudes of local leaders and service-providers

Some patients focussed their opinions on percieved social injustice and the negligence of their local village leaders (*grammo mattobbar*). When patients go to them for help, some leaders play a positive role and others less so. The fieldwork shows that some leaders try to help patients by providing them with financial help, moral support and advice, while others make commitments but then do nothing. For instance, one arsenic-affected woman had sought help from a local leader: ‘When I came to know that I am affected with arsenic, I went to Mr (Y) for help. I told him everything and he gave me some money for medicines and also told me that he will arrange a consultation with a doctor about my health. I am very pleased with him.’ Another remembered with distaste the attitude of a local leader who said: ‘What can I do for you? I am not a doctor. When you have got a disease, go to a doctor for your treatment. Only a doctor can help you. If you are in political trouble or have other problems, then I can help you.’

Patients also had mixed experiences from their own elected local administrators (chairman and members). Generally, in rural Bangladesh, when people cannot get help from any other source, they go to their local representative. They are trusted more than any outside organisation but on the issue of arsenic, responses varied from insincere commitments to aggressive dismissal. One response is typical: ‘Why do you come to me? I cannot do anything for you. It is not my duty to deal with arsenic, I’m scared about it myself.’ Another member told an arsenicosis sufferer, ‘You did not cast your vote for me. Don’t come to me for any help. I will help my men first.’

Some patients have sought credit from NGOs because they do not have any work to sustain their families and are at the stage of ‘distressed sales’ of their assets in order to survive. Seeking financial help from a local NGO was a last resort and patients generally thought that NGOs could help them because they are engaged on socio-economic development as well as distributing relief to the flood-affected people. One patient (40, male, causual labourer) was optimistic but received a negative response: ‘Why do you need credit? How can we help you? You are a patient and you are so sick that you will not work hard. We don’t know whether you will be able to repay the instalments in time or not. When you recover, we will help you.’

According to their patients, few of the doctors in Ghona Union know anything about arsenicosis. This is not just a problem of diagnosis (Murshed et al., 2004) but a general shortage of information at all levels of the medical profession. One interviewee (40, male casual labourer) described the difficulty of getting satisfactory treatment:

> When I asked about my skin problems, three doctors explained the problems in three different ways and they prescribed different medicines for me. So, how can I trust the doctors? Actually, they know nothing about arsenic.

The vast majority of local people cannot afford doctors’ prescription fees and the cost of medicines over an extended period. They often present when their illness is already at a critical stage, when there is very little chance of recovery. Patients reported that some doctors have a tendency to prolong the treatment in order to boost their own incomes. We have no direct evidence that this allegation is true but it certainly seems that, in the absence of diagnostic certainty and therapeutic strategies, doctors have failed to reveal the full situation to their patients.

Arsenic poisoning and survival strategies

The survival strategies adopted by arsenic-affected patients can be viewed as (a) coping strategies and (b) adaptation strategies. In a coping strategy, almost all of the patients take an immediate and temporary action for survival (WHO 2000). An adaptation strategy refers to the long-term and permanent attitudes of the arsenicosis patients in solving their social problems (Hassan, 2003). Some patients took decisions to solve their social problems quickly and others deployed a combination of adaptation strategies for the long term.

Coping Strategies

The first strategy involves keeping a safe distance from the unaffected people in order to avoid social embarrassment. The most seriously affected patients do not feel able to go outside thinking that, if they leave their home, people will make hurtful comments to them. One patient (55, farmer) recounted his experience:

> One day I was at the Ghona *Hatkhola* for my regular green vegetables. Somebody then started to talk about arsenic poisoning in my presence and at a certain point they made a criticism about my health. They even asked me why I was spreading this disease. I am very distressed about this situation. I have decided not go outside for any reason if I can avoid it.

Some patients decide not to attend social activities and functions, and even not to continue with some personal relationships.

> I went to a wedding and some people made problems there. I realised the situation and came back home. It was a really embarrassing situation for me and for the other guests as well (48, male, farmer).

The second strategy covers coping with in-family problems. One affected person (26, male, farmer) experiencing such problems remarked that ‘after getting these sores on my palms, I am facing ignorance from my parents. I have decided not to talk with them and not to meet them. I think I am a burden to this family. Everybody in the family is rude to me.’

Some patients, especially young women, have problems since it is difficult to arrange a marriage for them. People are generally not interested in making new relationships with those from an affected family.

> I am about 19. My parents are always worried about my marriage. I have decided not to marry. I want to leave this village. I will work in a family as a maidservant in a different area. I hope that will make my parents happy (female, no occupation).

The third strategy covers children affected with arsenicosis, who have difficult access to school. They cannot play with their friends, and even some of their teachers neglect them. Some children now refuse to go to school and they discontinue their education. They may have already missed a significant number of school days. The parents of some of these children have decided to withdraw them from school. One parent of an eleven-year-old child said that:

> I have decided not to send my child to school. If there is not a tolerable environment and the teachers do not take care of them, why should I send my child to that school? If he stays at home, it is better for his mental health.

On the other hand, some children, especially girls, deliberately hide their arsenic symptoms. Such children want to continue with their education. The mother of a ten year old girl explained: ‘My daughter always avoids appearing in public. She goes to school covering herself (*borkha*) to make sure that no one sees the skin lesions that she has developed during the last two years.’ When asked about her situation, the girl added here that ‘My mum strongly advised me not to show my skin lesions to anybody and not to say anything about my problems. My friends ask me why I wear a *borkha*. I cannot play with my friends if I am covered with this *borkha*.’

Adaptation strategies

Some seriously affected patients take medical treatment. Although this is an expensive adaptation, they hope that if their health improves, they will be able to live as an accepted member of society.

> What are the alternatives? I think this is the best possible way to save youself from social injustice. If you continue the medication for a long time, you could get well and if you are well, why social isolation? People will do nothing if you are well (41, male, mechanic) .

We have seen that arsenicosis leads to changes in work responsibilities inside and outside the home. Patients are often physically unable to conduct laborious work in agriculture and there is a reduction of income supporting the family. In such cases, degrees of reliance on other family members may increase in order to sustain the household economy of patients. As the wife (35) of one patient explained:

> My husband is unable to work in agriculture. His palms are full of *zengoo* and nobody wants him. So, I go to the fields and earn some money. My daughter [aged 11] also works and contributes to the family. Until he improves, we will continue to do that.

Some sufferers and their families think that if they can establish a relationship with well-known local people such as social activists, political leaders and elected administrators, they can save themselves from social injustice. This policy can be seen as an adaptation mechanism at the community level. In addition, some organisations have planned awareness campaigns with the inclusion of arsenic messages in existing health and education programmes. The impact so far, however, has been minimal in the study area. These are indirect survival measures. For example, one very poor man commented that ‘I do not have any access to the deep tubewell. I have told my wife and son to collect arsenic-free water from that deep tubewell. I have come to know that the use of this water could cure me.’ In addition, some patients have reduced the consumption by different family members of staple foods and other consumption items over the long-term in order to reduce expenditure.

The final adaptation strategy might be called complacency. We found many people who, although they had heard of arsenic, claimed to be unconcerned. At this early stage in public consciousness it seems that arsenic patients are spatially marginalised but the majority of the unaffected feel no need to mobilize for either prevention or mitigation. This attitude, sometimes fatalistic, is summed by one in-depth interview respondent (male, 30, farmer):

> '…Why panic? Arsenic will not be a problem if God wants to keep me alive (ho, ho, ho!). Will God give you longer to live if you drink arsenic-free water?'.

Social risk and social hazards

This paper has focussed on the toxic effects of arsenic on social issues. A social hazard is concerned with the characterisation of the nature and magnitude of harm to people's social norms and social structure from a particular event (Hassan, 2003). Arsenic can be considered a social hazard if it represents a challenge to people's social status, their lifestyle, and sometimes their attitudes, whether measured in terms of 'social degradation' or 'social injustice'. People in the study area are concerned about arsenic poisoning and there are arsenicosis patients who are already experiencing many types of social problems, and a hazardous social condition is developing generally.

Arsenic is not the only cause of toxicity to human health, but it results in major social dislocation for the affected people. Patients identified in the study area are adopting various survival strategies for their social problems but they face continuous hostility.

> What can I do now? I'm very upset about the social problems that I have been experiencing after getting this skin lesion. Everybody in this village treats me with disdain. They are rude and angry and I do not get any sympathy from anybody. I feel that it is unsafe to live here (40, male, casual labourer).

There are some social risks that unaffected people are not aware of, but arsenicosis patients can weigh up these risks on the basis of their practical experiences. The medical risk of arsenic toxicity can be stated statistically, but the present concern of this paper is how arsenic-affected patients are living with the context of their illness. The above discussion of the social problems reveals a picture of social hazard faced by arsenic-affected people. The loneliness, social injustice, and damage to social bonds in the study area make the situation hazardous.

Some people affected by arsenicosis were found to be leading miserable lives. A national daily newspaper has reported that, frustrated by the treatment of the local doctors, one woman patient went to India for better treatment but, failing to be cured, she attempted to commit suicide by taking poison (*The Daily Star*: 4th July, 2001, Dhaka). In rural Bangladesh, a devastating situation arises when people die from arsenicosis. Some local *Molla* (clerics) will not bury them with Muslim rites. Dr Hassan came across an example of this during his field visit to Marua village in Jessore district in 1999.

Concluding remarks

The efficacy of qualitative analytical procedures has provided insights into the lay understandings of the arsenic-affected people about their social problems. We found that patients' experiences reveal severe negative social impacts. This involves living with social uncertainty, social injustice, social isolation and problematic family issues. We also found a sharp difference of perceptions on arsenic and social issues between the arsenicosis patients and unaffected people. The latter group mainly focussed on measures to prevent arsenic-induced diseases, such as the consumption of deep tubewell water, rather than on the existing social problems which the affected people were experiencing.

Qualitative inquiry remains ‘extremely important’ (Ong & Jordan, 1997) since it allows for understandings derived from people’s narratives of their own lives (Calnan, 1987). The present research has explored the patients’ own ideas about their social problems and the social management, i.e. what they think and do in terms of survival strategies and the solutions they envisage. In our opinion, policy-makers would do well to commission research of this nature rather than making unfounded assumptions about how people think and act on the subject of their health.

Our results indicate a locality with no positive mobilization on arsenic in civil society and little in the way of sustainable socio-political resources to mount and carry through campaigns to raise awareness, judge the scale and severity of the problem, and plan for prevention or mitigation. Our geographers’ instincts suggest, however, that there will be a range of local experiences across rural Bangladesh and we call upon the government to calibrate their policies to these spatially varied needs and opportunities.

In a further series of papers we will extend the discussion of arsenic into five other areas: policy with regard to mitigation options (Hassan et al. 2005); the suitability of deep tubewells as a possible solution (Dunn et al. 2005); the scientific indeterminacy implicit in the arsenic crisis (Atkins et al. 2005a); the formulation of policy in the light of recent literature on ‘environmental pragmatism’ (Atkins et al. 2005b); and the recent court case in London (Atkins et al. 2005c).

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Footnotes

[1] In other parts of Bangladesh, the friends and relations of those diagnosed with arsenicosis are said to be more motivated to adopt safe water habits than those who have no such personal experience. In Ghona, our study site, although many have *zengoo*, there have so far been few cases of arsenicosis authenticated. Lay knowledge is therefore still developing and there is even confusion between arsenic and iron, which is frequently found in the local aquifers.

[2] All names have been changed to protect the identities of interviewees.

[3] The tubewell is just outside the compound boundary wall of the holder, who is also the Ward Commissioner. This person contributed Tk 5,000 towards its sinking and feels a degree of ownership despite it being a public facility.