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## **Psychological and Psychosocial Effects of Rockfall on Children attending Redcliffs School at Main Road.**

### **Introductory.**

This opinion is provided to address two questions:

- (1) What is the likelihood of any significant negative psychological or psychosocial effects on children of returning Redcliffs School to the Main Road site, having regard to the context of living in the Bays area and the expert technical advice that, while there will be ongoing rockfall, with the mitigation in place there is no actual physical danger to people on the school grounds.
- (2) If any such effect is possible, can it be adequately mitigated?

In order to address this question, the first consideration is the possible psychological and psychosocial effects on children from exposure to rockfall as an example of a potentially traumatising experience. This is to be considered within the context of the community's past experience of earthquake and its associated events. Then the vulnerability and resilience factors in children's exposure to trauma will be considered. These considerations provide a basis to examine the effect of rockfall as potentially traumatogenic experience, and this is then considered in the context of the geotechnical evaluation of the risk and the mitigation measures.

The second question of mitigation of possible effects is considered, together with the role of the school in the environment where rockfall will occur.

### **The nature of trauma**

A trauma is defined as an experience of "overwhelming horror, fear or pain, along with helplessness" (Dwivendi, 2000, p. 7.). It includes at one extreme "exposure to actual or threatened death, serious injury" to self or witnessing or hearing about it occurring to others, and at the other extreme, the repeated exposure to threatening or aversive events (DSM-5, p. 272.). There is a range of exposure to threatening experiences which fall short of these definitions which may also cause traumatic injury to children, including situations of threat, fear and uncertainty, especially when separated from family and caregivers (Gordon, Farberow and Maida, 1999). In general, a traumatic experience is one which places the child under threat of harm or exposes them to harm occurring to others.

There is a continuum from extreme traumatic experience through to situations of fear, threat, uncertainty and anxiety. Principle defining features of traumatic injury are: intrusive memories or dreams of the experience, feeling as though it is happening again, extended distress at

reminders, avoidance of the situation and changes to beliefs, self concept and understanding. Less severe threatening experiences are likely to evoke anxiety and various forms of emotional reactivity, without the sense of involuntary intrusion and inability to come to terms with the memories.

### **Psychological and psychosocial effects of trauma.**

The traumatic experience is interpreted as threatening by the child. When in danger, a rapid, abbreviated interpretation of the situation is undertaken. It does not use all the child's knowledge and occurs rapidly using primitive, instinctive parts of the brain. This is referred to as a process of "appraisal" (Lazarus, 1999). The fact that it is quick and simplified enhances the possibility of rapid survival action. However, the appraisal is essentially subjective - it is what the child *thinks* is happening and what they *think* this will result in that create the traumatic state. Even if the threatened event does not occur, the child may be very disturbed by the fear and uncertainty that follow, which may undermine their sense of safety and security and expose them to the sense they continue to be in danger.

There are two dimensions of their response to this situation. The first results from the disturbed state resulting from the child's experience of the trauma. It exposes them to distressing emotions, undermines their sense of safety and security and is disruptive to most areas of their development. The second dimension is a changed sense of their environment. The trauma is associated with the place, circumstances and people present at the time. Children often find it threatening to explore their environment, engage in effective peer relations and trust adults. It can alter their engagement in their social environment and disrupt their social development. Their sense of danger and need to protect themselves leads to some children developing antisocial behaviours, which often result from their faulty appraisal of their circumstances (Nader, 2014). The consequences of traumatic experience are disruptive to their emotional, mental development, relationships and capacity to engage constructively with their world.

The subjective aspect of traumatic experience becomes important when there is threat of danger without the threatened event occurring, or danger without any impact or injury. In such circumstances there is no easy way for the child to determine their level of actual danger. Their appraisal may lead to a greatly simplified view derived from only some features of the situation. The interpretation of events by trusted adults becomes essential to their experience and the basis for their appraisal of their danger or safety. It may take some time for them to accept the adults' view of the actual danger.

The question of whether exposure to rocks falling off the cliff could constitute a traumatic or threatening experience depends on the child's appraisal of the events.

### **Trauma and the role of parents and teachers.**

Children's responses to traumatic circumstances are strongly determined by the reactions of parents and adult caregivers who are present at the time and during their recovery. Children are not independent "knowers;" they are aware of what they do not know and expect to take information from parents and adults. One of the most significant predictors of a child's distress after disaster is the distress of their parents and expressed negative emotion in the family. Children will take cues from the emotions and behaviour of adults even if problems are not verbalised. If adults discover children's appraisals and correct misinterpretations, broaden their perspective and place it into a more realistic context, children's appraisals are replaced by more realistic and comprehensive interpretations which become the basis for working through any emotional reactions they have and restoring a sense of security and safety.

It is oversimplified to consider children's reactions to trauma without placing them in the context of the adults' understanding, their communication and emotional reactions. If adults behave and explain why an event is not dangerous, the child can be expected to come to share the adult's view. The child's view needs to be communicated to the adults so that they can give their interpretation of it. Adults can establish circumstances in which they encourage the children to express and correct any exaggerated or distorted appraisals they may have.

### **Vulnerability factors for trauma in children.**

A number of factors have been shown to increase a child's vulnerability to trauma when exposed to threatening events. These include non-traumatic adversity, but age, gender or ethnicity of themselves do not appear to be vulnerability factors (Silva, 2004; Nader, 2014). While older children have better comprehension of danger and are therefore more vulnerable to some situations, younger children are more dependent on parents' level of distress and external protective factors; however, physical proximity to danger and emotional proximity in terms of having someone important involved are risk factors for children, as is the intensity of the event and the presence of other concurrent emotional or family problems, lack of control and low self-esteem (Rogas and Pappagallo, 2004; Nader, 2014).

### **Resilience factors for trauma in children.**

Factors which assist children to recover from trauma include, good attachments, high intelligence or intellectual skills (or perhaps better understanding of the event) good self-esteem, sense of control, trust in caregivers, effective parenting, competence, achievement, flexibility, sociability and optimism (Nader, 2014). Since only some children exposed to severe stressors develop traumatic pathology, the presence of resilience factors may be a powerful way of protecting them (Silva and Kessler, 2004). Other factors which have been identified are: having talents, faith, close relationship and easy communication with parents or other adults, warm, secure, authoritative (as opposed to authoritarian) parenting, clear expectations and stable social structure, belonging to social groups and achieving as part of groups (Gordon, Farberow and Maida, 1999); and self-control, social competence, cognitive flexibility, adaptability, problem-solving, communication to caregivers (Shaw, Espinel, Shultz, 2012). Cultivating these qualities supports children to come to terms with distressing experiences.

### **Rockfall and earthquakes as a traumatising experience.**

It is the level of threat and danger that determines the degree of traumatic stress likely to be caused. However the level of threat is a result of the child's appraisal of the danger. Therefore it can be said that rockfall of itself is only a threat if the child has reason to think it is, especially since the child will have no close contact with rocks out of control. The same will be true of earthquakes if they do not cause immediate damage and injury. The child's appraisal will depend on their education and preparation before the event. This will depend on how parents and teachers have taught the child the significance of the events – that they are natural occurrences and by following procedures they can keep themselves safe. As with many other potentially dangerous events, such as traffic, water and animals, children are taught how to keep themselves safe and have a sense they can act to minimise the threat by following the guidelines they have been taught.

### **The Redcliffs School at Main Road and the mitigation of the risk.**

According to the geotechnical report, no rocks are likely to be dislodged with sufficient force to reach the bund which will be designed to withstand any likely impact. This will be sufficient distance from the cliff that there is no danger of rocks reaching it. In addition, the

barrier will be incorporated into a fence and landscaping which suggests even if children are in the vicinity of the fence and bund when there is a rockfall, they will have only limited exposure to it. Perhaps they will see where the rocks fall from the cliff but it sound unlikely they will be able to see the rocks rolling towards them. The technical report states there is a negligible risk to the school or children from rockfall.

Given that the physical risk is successfully mitigated, the danger from physical impact is removed. This being the case, the defining characteristic of a traumatic event or the risk of traumatisation is also removed – there is no possibility of the children being exposed to or witnessing or hearing about a violent dangerous event threatening life or limb. However it is possible some children, especially if they have been through other earthquakes may be distressed, in which case it is an exaggerated sense of vulnerability that is inconsistent with the actual risk. It is to be expected that children with such sensitivity are likely to present anxiety about a range of other stimuli – perhaps heavy trucks passing, thunderstorms or the like. In all these cases avoidance of stimuli that have become associated with their disturbing experience only consolidates the problem and the therapeutic approach is to provide controlled exposure in circumstances of safety so they are able to change their appraisal of them.

There may remain the children's fear of what might happen, their anxiety about the instability of the cliff and the sense of lack of control. These are related to their understanding of the situation and to emotional responses to it, rather than any actual threat. If this is cause for anxiety it indicates that they have made appraisals which are exaggerating the threat beyond anything actually likely to happen. In this case it is important that the parents and teachers as a community recognise and work with this exaggerated sense of vulnerability and help the children gain a more realistic assessment of the problem.

In this sense the task is like many others in the course of their development where children are taught to manage situations that they may initially feel afraid or, such as learning to swim, managing traffic and separating from parents. The assumption underpinning these developmental tasks is that the children are safe and the adults will prevent them coming to harm. This is normally communicated repeatedly in many ways to assist the children to take it in. If some children are fearful of rockfall, since there is no danger, teachers and parents can follow the same processes as they would with other developmental issues.

In this sense any risk arising from children's subjective appraisals of rockfall can be actively responded to within the context of the normal curriculum and specific responses to falls if they occur.

### **Mitigating the threat appraisals – the role of parents and teachers**

Consistent with understanding the features of their environment, the children will be taught about earthquake and earth movements and rockfall can be included as part of that education. Details of the of the cliffs and natural processes of erosion as well as seismic triggering of rockfalls can be presented and discussed in the context of how these events are managed and controlled, including the formation of the bund. This theme can be developed in relation to the curriculum, adjusted for the children's age and has the advantage of having direct examples in the school environment. If the children can be shown the cliffs, rocks and processes under conditions of safety where the teachers define it as a learning situation, it is to be expected that all except the most anxious children will see it as part of natural phenomena which they need to be aware of but not fear provided they take appropriate precautions.

This feature of the children's experience needs to be discussed between teachers and parents with an understanding of how it is being discussed at each grade level with help and advice to parents as to how they can reinforce the teachers' messages. It will involve the parents reinforcing the fact that there is no risk for them to be at the school and that the adults have acted to ensure that it is safe for them.

The more the rockfall can be associated as a natural occurrence of the New Zealand landscape, the less will it be identified with the threatening circumstances of the earthquake. Associations can be developed on the basis of the ancient formation of the cliffs and the natural process of erosion as well as periodic disruptions in the form of rain events and tremors. These help to take the rockfall out of the associations of threat and danger.

In this way the school can help the parents and teachers define the meaning of rockfall events so that they are not associated in the children's minds with danger.

### **Anxious children and parents.**

Where children have threat appraisals causing anxiety, it is important to consider whether this is primarily related to the cliff and rockfall or whether it is an anxious child and the rocks are only one of a range of anxieties. All schools can be expected to have some children who are anxiety prone and likely to interpret many situations as threatening when other children do not. These children are likely to have these problems regardless of the school they are in and it will be important that their tendency to anxiety is not confused with the issue of rockfall.

If the negligible risk factor is constantly presented in relation to the location of the school, the anxiety can be managed as an emotional problem, rather than disguised as resulting from a real situation. It is also possible that some parents may also be anxiety prone. If they are anxious about the rockfall causing injury in the presence of a negligible risk, it is important not to validate an unrealistic anxiety, but instead address it along with whatever other anxieties parents may have about their children in schools. The discussion about the rockfall must be conducted in relation to the factual basis of the fact that there is no risk, given the mapping of the rocks and the mitigation works and for the discussion not to be based on emotional appraisals. It is possible some parents may carry trauma from their earthquake or other experience and project this onto a situation where there is no danger. It may initially be necessary to give parents and teachers very detailed briefings of why the risk has been successfully mitigated.

### **Messages to be provided about the situation.**

The resilience factors discussed above in relation to PTSD and disasters suggest a number of approaches to ensure the children develop confidence. The first is to ensure there is open communication between adults and children about the cliffs, rockfalls and bund. Second the normalisation of the bund as a landscape feature and the rockfalls as a normalised phenomenon of erosion reinforce to the school community that it is safe. Third, the adults need to model confidence in the engineering solution and the limits to the behaviour of rock in earthquakes to limit the scope of anxious imaginings about what might happen and to relate them always back to the well-researched facts. If children seem concerned about the rocks, then teaching them to recognise and manage their own state will be of great benefit to their development – always based on the fact that there is in fact nothing for them to be anxious about. The sense of a changed environment that can follow from trauma can be adapted in this context by normalising the rockfall as a phenomenon that is of no danger and over time they will absorb it into their sense of a hazard that they are successfully protected from, like traffic and strangers.

### **Conclusions for Question 1.**

Since there is no physical threat, the likelihood of any significant psychological or psychosocial effects on children returning to Redcliffs School at the Main Road site seems negligible, provided that teachers and parents ensure that they work together to influence the children's understanding of the situation, encourage them to gain a sense of mastery and control over the situation based on the lack of danger; and they use it as a basis for increasing the children's understanding.

This does not preclude the existence in the school of a small number of children who may be anxiety prone and associate their anxiety with the rockfall. It is important to recognise that if they are anxiety prone, it is inevitable they will be anxious and in all likelihood in another school they would attach it to some other feature of the environment. This problem would need to be responded to as a problem of an anxiety prone child rather than a threat from rockfall. If and when there are rockfalls, the teachers and parents can actively engage the children along agreed lines to develop and understanding of what has happened to show the design is working and they can have confidence in their school environment. Working with children's appraisals of the meaning of sudden events on the cliff would allow them to be understood as not constituting a threat of danger. Once one generation have gone through the school it is likely the rockfalls and bund will become a normalised part of the school routine.

### **Conclusions for Question 2.**

Since any anxieties related to the rockfall are not based on a real threat, they do not conform to a definition of trauma which might render them damaging to the child. Instead, they are consistent with the sort of variation in anxiety proneness which is part of the range of normal development and is routinely managed to assist anxious children to develop confidence. The basis for this work is the fact there is no actual threat because of the precautions the school management have undertaken.

If there is a child in a family who had a traumatic earthquake experience and this is communicated to the child and expressed in relation to the rockfall, it needs to be managed as part of a broader assessment of the other ways in which the traumatic anxiety is manifest. Anxiety about rockfall will not be the only manifestation of it, since there is no danger there. This is only likely to be present in a very small percentage of families, since the incidence of lasting traumatic responses after natural disasters is generally small except for those most severely impacted (Shaw, Espinel and Shultz, 2012).

### **Potential psychological effects from rockfall.**

The following comments are made in response to the questions posed in the Scoping Document.

(3). Provided the children understand there is no danger from the rockfall, and understand the protective measure taken, I do not consider there are likely to be significant negative effects on the children from ongoing rockfalls, provided the teachers and parents ensure the events are properly discussed and explained. This does not preclude the possibility that a small number of anxiety prone children may be adversely affected, however, this will be part of a broader pattern of anxiety and needs to be addressed as such rather than related to the rockfall. I can see considerable positive effects in terms of detailed understanding of their environment, learning to respect natural forces and not take the stability of the earth for granted.

(4). Children living in the local area are likely to have other ways in which they will be exposed to the instability of the cliffs in the Main Road and other areas. Again it is assumed

that these will not constitute a danger to them. This will tend to normalise these phenomena and so render them less likely to have any negative impacts.

(5). Provided that the visual and auditory impacts of rockfalls are experienced within a controlled and supported environment with teachers and parents to interpret them, and the children have no sense of danger from them, I would expect them not to have any negative effects, but to be more likely to add excitement to their day. The associated narrative can help them understand the dangers and how they have been protected from them so that they learn greater respect for their environment if they go tramping in the future.

(6). Assuming rockfall is current and other earthquake phenomena are past, then the rockfall will be an immediate sensory experience and the other earthquake phenomena will be conveyed by anecdote since the children will have been born after the earthquake. It will give them a sense of natural forces but if done within a safe context it will be informative rather than threatening. If there is a future earthquake, the rockfall experience will teach them valuable lessons in safety and having realistic expectations. Since it is behind the bund while other phenomena may not be I would expect it not to be an important feature and they would be more concerned about what was immediately evident to them. These factors are likely to be more problematic to them than the rockfall.

(7). Children who have suffered or are suffering other stresses are only likely to be adversely affected by rockfall if they are not sure of the mitigation measures or if the sudden and intense sounds upset them. These will be indicative of an anxious sense of insecurity in the former situation and heightened sensitivity to the environment in the latter. In each case they would be indicators of more general issues – possibly posttraumatic stress. The constant exposure would not do harm to the child if the exposure can be provided within an environment of support, confidence and familiarity. In fact exposure is advocated as an important component of posttraumatic treatment.

Negative effects from ongoing rockfall is likely to be evident in reactivity and distress if it occurs, as opposed to generalised distress not associated with rockfall events. In this case negative effects from prior earthquake experience in general are likely to affect broad areas of the child's development, but the rockfall is likely to be just an additional stressor. But there is scope for creative work with the child around the fact there is no danger.

(8). I do not for see any negative effects of the mitigation works on the school boundary, provided the children understand and trust them, which is a matter of how they are explained to them. I would expect positive effects in understanding about how threats from the landscape can be mitigated, the value of engineering, not taking stability for granted etc.

(9). Most schools have some sort of out of bounds area, and provided this is normalised and the children are properly informed it would be no different than avoiding railway lines, busy roads or the like.

(10). The likely short term effects would be associated with the education process, teaching the students and parents about the mitigation works and the safety they provide. There may be some reactive anxiety for the first few rockfalls, but as the mitigation works showed their effectiveness I would expect they would inspire confidence. In the medium to long term, I would expect the rockfall to be incorporated into the normal routine. Almost anything can be absorbed into normality and routine provided it does not constitute a high threat.

(11). Potential negative effects can be mitigated through discussion, teaching and sensitive support to the children to understand the nature of their landscape and the ability of the adults to make it safe. This is likely to need to be repeated throughout the years as children progress through the school. It can be worked into the curriculum but also through informal discussions.

(12). The list of vulnerability and resilience factors listed above would provide a basis to consider how the school program might foster the latter and seek to minimise the former. The site will have a particular environmental feature, but many schools are in environments which have particular features.

(13). As I understand it, there will be no children in the school who experienced the earthquakes when it would move back to Main Road site. Perhaps exposure to rockfalls will be an advantage to those children who did not experience the earthquakes because it will give them a safe experience of an aspect of it. Those who did not experience it will have it as an element of history and will be more able to normalise the rockfall.

**Background:** I am a clinical psychologist, and have been working with natural disasters since I was part of the Royal Children's Hospital team working in the aftermath of the Ash Wednesday Bushfires in Victoria in 1983. I was appointed a consultant for disaster recovery to the Victorian Department of Health and Human Services in 1989 and have continued in that position to the present. I have also had a role as consultant for emergency recovery to Australian Red Cross for over 10 years. I have participated in the recovery of some 35 large and small natural disasters throughout Australia. I have also consulted to the Ministry of Civil Defence and Emergency Management for floods in New Zealand in Northland, Bay of Plenty, Manawatu, Horowhenua and Picton areas as well as having made 8 trips to Christchurch for New Zealand Red Cross and CERA since the earthquakes. I have published articles and conducted research into emergency recovery and regularly work with disaster affected and traumatised people in my clinical practice.

### **References:**

- American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition, Arlington VA, American Psychiatric Association, 2013.
- Dwivendi, K., Editor, (2000) Post-Traumatic Stress Disorder in Children and Adolescents. London, Whurr Publishers.
- Gordon, N., Farberow, N. and Maida, C. (1999). Children and Disasters. Philadelphia, Bruner/Mazel.
- Greenwald, R. (2000). The trauma orientation in child therapy; in Dwivendi, K., Editor, (2000) Post-Traumatic Stress Disorder in Children and Adolescents. London, Whurr Publishers, pp. 7-24.
- Lazarus, R. (1999). Relational meaning and discrete emotions, in Scherer, K., Schorr, A. and Johnstone, T. Editors (1999). Appraisal Processes in Emotion. Oxford, Oxford University Press, pp. 37-67.
- Nader, K., (2014) Understanding and Assessing Trauma in Children and Adolescents. New York, Routledge.
- Rogas, V. and Pappagallo, M., (2004). Risk factors for PTSD in children and adolescents, in Silva, P. (2004). Posttraumatic Stress Disorders in Children and Adolescents: Handbook. New York, W.W. Norton, pp. 38-59.
- Scherer, K., Schorr, A. and Johnstone, T. Editors (1999). Appraisal Processes in Emotion. Oxford, Oxford University Press
- Shaw, J., Espinel, A. and Shultz, J. (2012). Care of Children Exposed to the Traumatic Effects of Disaster. Washington, American Psychiatric Press.
- Silva, P. (2004). Posttraumatic Stress Disorders in Children and Adolescents: Handbook. New York, W.W. Norton.



Silva, P. and Kessler, L. (2004) Resiliency and vulnerability factors in childhood PTSD, in  
Silva, P. (2004). Posttraumatic Stress Disorders in Children and Adolescents:  
Handbook. New York, W.W. Norton, pp. 18-37.



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## **Investigation into the potential psychosocial implications if Redcliffs school returns to the Main Road site with the proposed mitigation measures in place**

### **Professor David Johnston, GNS Science and Massey University**

The following statement has been prepared by Professor David Johnston from GNS Science and Massey University. I am a Principal Scientist at GNS Science (New Zealand's Geological Survey) and Director of the Joint Centre for Disaster Research in the School of Psychology at Massey University, Wellington, New Zealand. My research has developed as part of multi-disciplinary theoretical and applied research program, involving the collaboration of physical and social scientists from several organisations and countries. My research focuses on human responses to tsunami, earthquake and weather warnings, crisis decision-making and the role of public education and participation in building community resilience and recovery. I am not a psychologist so will make no comments on psychological impacts on individuals and the community and will leave this to other members of the expert panel. However, I am qualified to comment on the disaster management context and the relationship between the school and community in building and maintaining disaster resilience and social capital to manage complex and challenging adverse events. I have also researched the risk communication and offer an opinion in this area related to the return to the Main Road site.

Schools have a key part to play in creating resilient, socially connected communities and this has been illustrated by the Redcliffs School. The links between community resilience and school is well established in the literature (Witten 2007; Mutch 2014) and supported by our research (Finnis et al. 2007; Ronan & Johnston 2005; Stuart et al. 2010). Our 1995 study, following the 1995 Ruapehu eruption, found that both the school and parent support influence the responses of children. In this research we have found that children's perceiving their parents to be upset about a volcanic eruption and perceiving distressing talk at home about the event both predicted reduced post-hazard-related coping ability (Ronan & Johnston 1999, also see Huzziff and Ronan 1999).

Our research and that of others also shows that social cohesion intensifies in the face of disasters, as a sense of community develops in response to the (actual or imagined) shared experience of an event and its aftermath. The maintenance of the integrity of the Redcliffs School community following the earthquakes, such as maintaining the before-school meeting place and bussing the children to the temporary school location has helped maintain and possibly enhance the social capital of both the school and community. The critical role of social capital in disaster recovery is well established (Aldrich 2012). Daniel Aldrich (2012) shows that social capital can bring at least three benefits in a disaster situation; 1) individuals are more likely to receive mutual aid, support and/or information in a disaster; 2) cohesive communities can overcome barriers to collective action and work cooperatively in the recovery; 3) individuals with stronger ties to community are less likely to move away from damaged areas and more likely to work tirelessly to in the recovery. All three of these attributions can be seen in the Redcliffs community.

The school community has a key role to play when the school returns to the Redcliffs site. This is both to support the students as teachers address any perceived risk issues they may have with the Main Road site and to mitigating any impacts of future rock fall events should they occur. The return to the Main Road site will be an important event for pupils, parents/caregivers, staff, ex-pupils and their families, wider school community and also the general community. This event provides an opportunity to assist the recovery process at a number of levels. This will help develop the foundations for managing and mitigating the response to any future earthquakes and rock falls events that may occur.

Understanding and managing the risk communication is essential for any return to the site. While all disasters create extensive physical loss and destruction with consequent social and psychological disruption, some people and communities cope with, adapt to and recover from disaster consequences better than others. That is, some people and groups are more resilient than others. The importance of understanding resilience extends beyond minimising the loss and suffering of affected populations. It also becomes important in a context in which the risk faced by society is ever present (e.g. future earthquakes or further rock falls). A recent synthesis by our team (Becker, Paton & Johnston, 2015) reviews community resilience research and shows that there are a number of individual, community and societal/institutional factors that can influence resilience and these can be represented as an overall model of resilience.

These factors need to be considered and accounted for when developing effective risk communication strategies. These communication strategies should include a variety of activities (e.g., effective messaging, community meetings, scenario-building, school and work activities, drills and exercises, training, etc.) to target and build on different resilience factors and to account for the differing stages of readiness of members of the public. Although this review and guide is intended for communities, many of the principles and guidance outlined is applicable to Redcliffs School and can be used to help develop an effective strategy for risk communication. This should also be linked to the guidance provided by the other “experts” to address the psychological and psychosocial issues.

## **References**

Aldrich, D.P, (2012). *Building Resilience: Social Capital in Post-Disaster Recovery* (Chicago: University of Chicago, 2012)

Becker, J., Paton, D.; Johnston, D. (2015). *Communication of Risk: A community resilience perspective*, GNS Science Report 2015/66. 30 p.

Finnis, K., Johnston, D., Becker, J., Ronan, J. & Paton, D. (2007). *School and community-based hazards education and links to disaster resilient communities*. *Regional Development Dialogue* 28: 99-1008.

Huzziff, C. A., & Ronan, K. R. (1999). Prediction of children's coping following a natural disaster-the Mount Ruapehu eruptions: A prospective study. *Australasian Journal of Disaster and Trauma Studies*, 1, 1999-1.

Mutch, C. (2014). The New Zealand earthquakes and the role of schools in engaging children in emotional processing of disaster experiences. *Pastoral Care in Education* 32(1): 54–67

Ronan, K. R., Alisic, E., Towers, B., Johnson, V. A., & Johnston, D. M. (2015). Disaster preparedness for children and families: a critical review. *Current psychiatry reports*, 17(7), 1-9.

Ronan, K.R.; Crellin, K.; Johnston, D.M.; Finnis, K.; Paton, D.; Becker, J. (2008). Promoting Child and Family Resilience to Disasters: Effects, Interventions, and Prevention Effectiveness. *Children, Youth and Environments*, 18(1): 332-353.

Ronan, K.R., Johnston, D.M. (1999). Behaviourally-based interventions for children following volcanic eruptions: An evaluation of efficacy. *Disaster Prevention and Management* 8:169-176.

Ronan, K.R.; Johnston, D.M. (2005). Promoting community resilience in disasters : the role for schools, youth, and families. New York: Springer. 210 p.

Stuart K.L., Patterson L.G., Peace R., Johnston D.M. (2010) Social cohesion or social strain?: Temporary school closure in two New Zealand communities, GNS Science Report no. 2010/08.

Witten, K., McCreanor, T., Kearns, R.A. (2007) The place of schools in parents' community belonging. *New Zealand Geographer* 63: 141-148.

**Invited opinion into the potential psychosocial implications if Redcliffs school returns to the Main Road site with the proposed mitigation measures in place**

**Associate Professor Sarb Johal, Joint Centre for Disaster Research, Massey University / GNS Science**

1. The following statement has been prepared by Associate Professor for Disaster Mental Health, Sarb Johal, from the Joint Centre for Disaster Research, a collaboration between GNS Science and Massey University.
2. I am a clinical psychologist by training and have worked extensively in the field of psychosocial impacts, interventions and support for affected individual communities at policy and operational level since 2006. I confirm that I hold current valid registration and scope of practice in New Zealand with the New Zealand Psychologists Board (Registration Number 90-02855). I also provide clinical advice and services, and advice on policy development and implementation for several NZ Government agencies and NGOs. My research over the past few years has focused particularly on the impacts of emergencies and disaster on those who are tasked to care for others, especially over the longer-term recovery and adaptation period.
3. My understanding of the purpose of the opinion I have been asked to provide is concerning the potential psychosocial impacts for children associated with a decision concerning returning the school at the Main Road site in Redcliffs with proposed mitigation measures in place. In particular, you have asked me to attend to two particular questions:
  - “1. What is the likelihood of any negative psychological or psychosocial effects on the children of returning to Redcliffs School to the Main Road site, having regard to the context of living in the Bays area and the expert technical advice, while there will be ongoing rockfall, with the mitigation in place, there is no actual physical danger to people on the school grounds?
  - “2. If any such effect is possible, can it be adequately mitigated?”

Issues to be considered

4. In my response to these questions, I would first like to propose an understanding of the terms psychological and psychosocial, as I believe that this has a critical bearing on the questions you seek an opinion on.
5. The term psychosocial can be defined as, ‘relating to the interrelationship of social factors and individual thought and behaviour  
<http://www.oxforddictionaries.com/definition/english/psychosocial>).

6. The term 'psychological' is defined as 'of, affecting, or arising in the mind; related to the emotional and mental state of the person (<http://www.oxforddictionaries.com/definition/english/psychological>).
7. This helps us to clearly understand that psychosocial effects are context dependent, whereas psychological effects refer to changes that may occur within an individual.
8. Therefore, when trying to understand the psychosocial and psychological effects if Redcliffs school returns to the Main Road site with the proposed mitigation measures in place, it is important to take an ecological perspective. That is, not just how it may affect the child alone, but how it may affect the child in the social contexts in which they live their lives. This means considering the impacts of being in this school on their parents, other family members, the school as a collective (i.e. classmates, teachers, other staff), the friends and neighbours, and their sense of connection to the place in which they live.
9. An individual's experience of psychosocial wellbeing is determined largely by the context he or she lives in. If a person's immediate surroundings and community are disrupted, people are likely to be in some discomfort or distress, even if only in the short-term. Since contexts and individual factors are always changing, so will the experience of psychosocial wellbeing. This dynamic nature of the experience makes it very difficult to provide a standard definition of what psychosocial wellbeing is, or how to recognise it.
10. It is therefore critical to understand what psychosocial wellbeing means locally for all the interrelated groups and communities affected by a disaster before planning a psychosocial intervention to improve wellbeing, or to protect an affected community before changes in their psychosocial context. This is the only way to ensure that the planned activities are relevant for the affected community.
11. One of the most frequently mentioned social resilience attributes in the research literature are community gathering place, followed by social support, knowledge of risks and consequences, collective efficacy, and sense of community (Kwok et al, 2016).
12. Schools are an extremely important source of social support; for their students, but also for the wider community. They provide a focal context for restoring routines after disasters, providing a sense of stability, safety and protection in challenging circumstances (Johnson and Ronan, 2014). Teachers also become important mediators for psychosocial wellbeing and support in communities directly impacted by disaster. They are seen as trusted sources of information, readily accessible, and a constant relationship in a student (and family's) life when a disaster occurs and in its aftermath (Johnson & Ronan, 2014).

13. Schools not only operate with an educational or social function: they also operate in a certain context of place and time. The interactions between students and the school and the psychological ties that this relationship represents can be thought of as place attachment, or place identity (Stedman, 2002). Disruption of place attachment bonds can result in significant emotional, physical and social distress; the restoration of such attachments may be an important contribution to social recovery and resilience (e.g. Scannell, et al, 2016).
14. The role of the family is probably the most important factor following a disaster in terms of conferring protection or increasing vulnerability of children to negative psychological effects following disaster (Ronan et al, 2008). Children's stress has been strongly shown to be influenced by a parent's stress; parents who are able to provide a model of warmth, support, consistency, predictability can decrease a child's vulnerability, whereas a distressed parent can increase a child's vulnerability.
15. In these ways, the child is not alone. The child exists in a social context that has deep influence of their psychological wellbeing. The relationship between the child, their school, parents, siblings, peers and wider community networks and how they deal with stress and challenging circumstances all have an impact upon how they learn to deal with challenging circumstances themselves.
16. The children and families that attend Redcliffs School are not only exposed to potential rockfall should the school be re-opened on the Main Road site, but there is also the continuing underlying risk of further earthquakes affecting the entire region. Indeed, this applies to all of New Zealand, but is particularly pressing for the local community given the 2010-11 Canterbury earthquake sequence and the more recent activity in February, 2015. This is a hazard that residents will continue to be exposed to, no matter where in the Port Hills area they live, work or are educated. So, as such, this becomes a background factor on top of which the specific risk of rockfall and its consequences are projected on to.
17. If we look at the specific case of the psychological and / or psychological impacts of rock fall on affected communities, especially children, it is clear that there is very little relevant literature available (Kennedy et al, 2015). Mudslides during Typhoon Morakot in Taiwan produced three studies on the same cohort of 277 adolescents who were displaced as a result of the disaster. The issues that were discussed in these studies, although interesting, do not match up well to the group of children being considered in this context in Redcliffs. However, it is notable that more disaster exposure experiences were associated with increased suicide risk (Yang et al, 2011), and perceptions of high levels of family support were found to be associated with lower suicide risk (Tang et al, 2010).

18. An alternative way of conceptualising the circumstances in which these children and their families may find themselves is through the lens of continuous traumatic stress. Rather than the temporal focus being on what has happened in the past, this approach focuses on exposure to current and future hazards. When people become focused on safety in the face of anticipated danger, it is likely that their thoughts may become dominated by what might occur and ways of avoiding this (Diamond et al, 2010).
19. Although much of this work is based on contexts featuring highly traumatizing events, Kaminer, Eagle & Crawford-Browne (2016) offer some suggestions for working in situations where continuous traumatic stress may be a consideration:
- Assistance with threat discrimination capacity – assisting people to be appropriately watchful for cues that threat may be about to occur, rather than being overly attentive and sensitive to threat. The aim is to hone the capacity for danger attunement so that it becomes conscious and agentic, enabling people to sort through contextually related cues to determine how to be safe in their environments. In this context, clear information and support for children and their families concerning perceived risk in moving back the Main Road site becomes pivotal .
  - Encouragement of (re) building of social relationships and networks – this helps to alleviate isolation and reduce time for rumination on possible threats that may have become overblown. They may also help to normalise through shared confirmation of any difficulties and perceptions, as well as building the capacity for collective action and agency.

### Summary and recommendations

20. The crux of the matter seems to be that schools are an important part of the community, and their continuation in their many functions in contributing to community recovery after disaster should be a priority. This not only encompasses their function, but also their location, as a place attachment.
21. From the information presented to me at the briefing meeting and in preparation for this document, it is my understanding that although a low residual risk for ongoing rockfall remains (as evidenced in the February, 2016), the engineering solution proposed is designed to ensure that the school area and barrier bund reduces the risk of physical harm to anyone in the school area to a very low level.



22. Although, continuous traumatic stress maybe a consideration for a few, I am also satisfied that steps can be taken to mitigate this risk, and to deal with any consequences as they may arise.
23. It is clear that a child's psychological adaptation to challenges, superficially in this case, possible exposure to the sight and sound of rockfall, is related to his or her psychosocial context. Families and schools are critical in shaping this context, and this relationship can be strengthened to improve children's wellbeing.
24. Communicating about risk is fraught with difficulty. Although it is apparent that there is strong community support for the school to return to the Main Road site, understanding and managing this risk communication is essential for any return to the site. I will leave it to others whose main expertise lie in this area to comment further on this.
25. If parents are anxious, it is likely that their children will be influenced by this. If parents are at ease and can demonstrate that challenging events or information are not insurmountable but can be discussed appropriately and with support, it enables children to cope far better than if the parent becomes distressed and unavailable to support the child.
26. Teachers and other school staff are likely to play a critical role in communicating risk to their students, their families and the wider community. They are seen as trusted sources of information. However, care should be taken that they are supported in this task too. It is a weighty responsibility to carry, and they should have assistance and support in this where needed.
27. Open, honest and age-appropriate discussion help children to understand and effectively cope with challenging situations. A whole-of-community approach, embracing the entire psychosocial context, will help to reduce the risk of psychological symptoms or reduced wellbeing for students and the communities they live in.

#### Specific suggestions

- Develop a publicly accessible 'living' FAQ that is accessible for students and their families – this can grow and be added too as more information / questions / answers come to light
- Ensure that there is a good process for listening to community concerns as transition to any new arrangements take place, and that agreed point are acted on swiftly and results are communicated to all, even if the outcomes are less

than optimal. This way trust can be built and maintained to help to manage difficult situations as they arise

- Consider integrating social and emotional learning about living with rockfall risk into curricula. Comprehensive reviews of social-emotional learning programmes show a significant correlation with students' academic and social outcomes (e.g. Zins et al, 2004).

## References

- Diamond, G. M., Lipsitz, J. D., Fajerman, Z., & Rozenblat, O. (2010). Ongoing traumatic stress response (OTSR) in Sderot Israel. *Professional Psychology: Research and Practice, 41*, 19–25. doi:10.1037/a0017098
- Johnson, V.A. & Ronan, K.R. (2014). Classroom responses of New Zealand school teachers following the 2011 Christchurch earthquake. *Natural Hazards, 72*: 1075. doi:10.1007/s11069-014-1053-3
- Kaminer, D., Eagle, G., & Crawford-Browne, S. (2016). Continuous traumatic stress as a mental and physical health challenge. *Journal of Health Psychology*. 2016 Apr 17. DOI: 10.1177/1359105316642831
- Kennedy, I. T., Petley, D. N., Williams, R., & Murray, V. (2015). A systematic review of the health impacts of mass Earth movements (landslides). *PLoS currents, 7*.
- Kwok, A. H., Doyle, E. H., Becker, J. S., Johnston, D. M., & Paton, D. (submitted, 2016). *What is 'social resilience'?* Perspectives of disaster researchers, emergency management practitioners, and policymakers in New Zealand. *International Journal of Disaster Risk Reduction*.
- Ronan, K. R., Crellin, K., Johnston, D. M., Finnis, K., Paton, D., & Becker, J. (2008). Promoting child and family resilience to disasters: Effects, interventions, and prevention effectiveness. *Children Youth and Environments, 18*(1), 332-353.
- Scannell, L., Cox, R. S., Fletcher, S., & Heykoop, C. (2016). "That was the Last Time I Saw my House": The Importance of Place Attachment among Children and Youth in Disaster Contexts. *American Journal of Community Psychology*. <http://dx.doi.org/10.1002/ajcp.12069>
- Stedman, R. C. (2002). Toward a social psychology of place: Predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior, 34*, 561-581, doi:10.1177/0013916502034005001.
- Tang, T.C., Yen, C.F., Cheng, C.P., Yang, P., Chen, C.S., Yang, R.C., Huang, M.S., Jong, Y.J., & Yu, H.S. (2010) Suicide risk and its correlate in adolescents who experienced typhoon-induced mudslides: a structural equation model. *Depression and Anxiety, 27* (12), 1143-8.
- Yang, P., Yen, C.F., Tang, T.C., Chen, C.S., Yang, R.C., Huang, M.S., Jong, Y.J., & Yu, H.S. post-traumatic stress disorder in adolescents after Typhoon Morakot-associated mudslides. (2011). *Journal of Anxiety Disorders, 25* (3), 362-368.
- Zins, J.E., Bloodworth, M.R., Weisberg, R.P. & Wahlberg, H.J. (2004). The scientific base linking social and emotional learning to school success, in J. Zins, R. Weissberg, M. Wang & H.L. Walberg (eds), *Building Academic Success on Social and Emotional Learning: What does the research say?* 3-22. New York: Teachers College Press.

Dear Gabrielle

**Re: Independent Opinion – Redcliffs School Main Road Site**

Thank you very much for asking me to be part of an investigation into the potential psychosocial implications for children, for those attending the school now and the children who will attend the school in future years, if the school returns to the main roadside with the proposed mitigation measures in place. I understand that the purpose of this work is to report to the Minister on the potential psychosocial impacts for children by the end of September 2016.

**TASK**

The scoping document specifically asked two key questions:

1. What is the likelihood for any significant negative psychological effect on children of returning Redcliffs School to the main road site, having regard to the context of living in the Bays area and the expert technical advice that while there will be ongoing rock fall with the mitigation in place there is no actual physical danger to people on the school grounds.
2. If any such effect is possible can it be adequately mitigated?

**CREDENTIALS**

First I would like to make clear my credentials and general views about schools so that my comments are taken in the right context.

I am a Child and Adolescent Psychiatrist and have been practising in the field for 32 years. The last 26 years have been as a Consultant Child and Adolescent Psychiatrist, the last 16 years in New Zealand and the last 12 years as Clinical Director of the Child and Adolescent Mental Health Service in Canterbury. I have been involved in a considerable amount of research, but more recently in service development. After the Christchurch Earthquakes, I had some involvement with planning the psycho social recovery process as part of the Canterbury DHB team.

**BACKGROUND**

The scoping document outlines the background to the current investigation. It follows the Education Report that informed the Minister of Education's decision on the next steps for Redcliffs School. The Minister agreed to the Ministry carrying out an in-depth investigation into the potential psychosocial implications for children (both those attending the school now, and children who will attend the school in future years) if the school returns to the Main Road site with the proposed mitigation measures in place.

As part of a wider opinion regarding the submission of the Redcliffs School around the possible closure of that school at the end of the year, I have previously provided an opinion regarding the issues and the potential psycho social impact on children of occupying a site where there will be further rock fall. My view was as follows:

*“In general, people living under an environmental threat react in different ways. Initially there may be a great deal of anxiety. In response, some may flee to avoid the danger, some may use the psychological defence of denial and some may become very distressed and ‘paralysed’. Over time, for those who continue to live with the danger, some form of adaptation occurs. If they cannot adapt or flee, then they will live in a continued state of stress and helplessness. That carries an elevated risk of mental and physical health problems.*

*Living in a danger zone may carry the risk of psychological effects on children. However, for the individual child the extent of the risk can be influenced by a number of factors, internal and external. The main internal factors are related to the child’s understanding of the danger and how much of a threat and what kind of threat it poses to them, and the cognitive developmental stage of the child. The main external influences are related to how parents (and teachers) react to the threat and the availability and visibility of mitigating influences. Older children are usually more vulnerable than younger children to the psychological effects of war, for example. The younger child’s psychological response resonates with the parental response as they have less cognitive capacity to independently evaluate the dangers. Parents usually make the decision for children regarding whether or not they live in a danger zone and the response of children to the danger depends to a large extent on how they see the parents react.*

*Relating this to the Redcliffs school, and in the worst case scenario where the children are largely aware of the risk of rock falls and where they feel helpless about mitigating or reducing that risk, then they would be exposed to a chronic situation of stress. It is known that exposure to intense acute and chronic stressors during the developmental years has enduring neurobiological and psychological effects with subsequent increased risk of anxiety and mood disorders as well as physical health problems through the impact of chronic stress on the immune system. “*

**Having read the literature Review you provided, my opinion above is confirmed and still stands.**

## **CURRENT REPORT**

This report is based on:

1. The scoping document provided by Gabrielle Wall on 4 August 2016.
2. Briefing from technical expert Nick Harwood on 16 August 2016 at Elliot Sinclair Offices.
3. Discussions with 3 other psychosocial experts on 16 August 2016 at Elliot Sinclair Offices.

4. Discussions with the Chair of Redcliffs School Board and the School Principal.
5. A site visit to the Main Road site, the Van Ash site and neighbouring areas.
6. Summary of submissions provided by Gabrielle Wall.
7. A Literature Review provided by Gabrielle Wall.
8. My own past experience and literature readings.

What is the likelihood of any significant negative psychological or psychosocial effects on children of returning Redcliffs School to the Main Road site, having regard to the context of living in the Bays area and the expert technical advice that, while there will be ongoing rockfall, with the mitigation in place, there is no actual physical danger to people on the school grounds? If any such effect is possible, can it be adequately mitigated?

**I take it that, under these circumstances, the level of risk from rockfalls (existent but negligible) and the mitigation measures will be effectively communicated and explained to the community.**

Under the circumstances stated in the question, the likelihood of any such negative psychosocial impact will probably be determined by:

1. Past exposure and context of life. Living besides hills and cliffs seems to be part of normal life in Redcliffs. Many have seen and experienced rockfalls. That is not dissimilar to how communities live next to a dormant or semi-dormant volcano. Similarly, people get accustomed to living in a war zone and develop the coping mechanisms that enable them to manage the psychic anxiety associated with such circumstances. Under such circumstances people become desensitised and accustomed with the net result that danger related stress is not significantly elevated.
2. Trust and Empowerment. Taken from the literature review: "Trust is particularly important when people have to make decisions under conditions of uncertainty . Levels of risk acceptance and people's willingness to take responsibility for their own safety is increased, and decisions to actively manage their risk more likely, if people believe that their relationship with formal agencies is fair and empowering." Furthermore, "effective risk communication is key to advising people about risk and facilitating the development of social resilience. A recent review identified personal experience of a natural hazard and trust (or lack of trust) in authorities and experts as having the most substantial impact on risk perception.
3. Parental/Family concerns. Taken from the literature review: "Children's stress following exposure to a traumatic event has been shown to be strongly influenced by parents' stress. Indeed, levels of parental distress following a disaster may be the most important predictor of a child's longer-term reactions. Furthermore, "a parent who is able to provide warmth, support, consistency, predictability, and a "coping

model” for their child may decrease a child’s vulnerability; conversely a distressed parent can increase a child’s vulnerability”.

4. Methods of communication. The crucial component in the exercise is how the risk is communicated and how the mitigation is explained. I do not believe that sending out a leaflet is going to be sufficient, nor having a Town Hall style meeting where they are shown a power point presentation is going to do the job. Empowerment is absolutely crucial. It would be very useful to ask the Community as to what it would take to convince them that the mitigation is going to protect the children from physical harm. The process has to be a partnership between the school board and the school community and the parents.

It is not possible to rule out 100% any possible effect because:

1. There is always the possibility of rockfalls no matter how minimal it is, and
2. There will always be people who are prone to have anxiety about many things in life (including rockfalls) no matter how few their numbers might be.

The risk cannot be **entirely** eliminated but can be effectively minimised and managed.

## **KEY QUESTIONS**

### **Is the Main Road site safe?**

After attending the technical expert’s presentation and the visit to the school site, on a personal level I am convinced that the risk of harm to people on the school grounds is minimal, given the mitigation measures (the bund and the shifting of the school boundary). However it is important that the parents and families of children attending the school are convinced of the same. It is the parents/family will determine the children’s sense of safety at the school site. Having visited several places in the area it seems that living besides hills and cliffs is part of normal life in Redcliff’s. Even the current school site at Van Asch is very close to a cliff (there were two large rocks in the playground). On a personal level, I would feel it is safe to send my children to school there. However, that is largely because I had the opportunity to see the evidence, weigh it and discuss it with the experts. Any concerned parent should be able to have a similar experience.

### **Is it possible to communicate the facts and the mitigation to the residents effectively?**

Having looked at the summary of submissions it is very clear that there is a great deal of engagement with the Redcliffs Community by the School and the School Board. The Board seems to be well connected with the community and there seems to be a significant level of trust in its role and actions. That should make the task of reassuring the community of the

site's safety easier and more likely to succeed. I therefore believe that it is possible for parents to feel safe and communicate that sense to their children. However there will always be a small number of people who will have, and continue to have concerns, and I believe that this group of people should not be ignored and should be engaged. A potentially effective measure of engagement and empowerment would be to seek their views and opinions about the kind of measures that would satisfy them that the school site is safe and that they will feel safe in it.

It would be useful to explain the relative risks in ways that are relevant to everyday life rather than 'percentages'. For example, comparing the level of danger to safety from rockfalls (with the mitigation in place) to the chance of winning lotto or being hit by a truck while crossing the road. It needs to be real and relevant.

Explaining the safety aspects and the mitigation should not be a 'single event', rather it should be an ongoing process particularly for the benefit of those who move into the community (and the school) later on in the future.

## **CONCLUSION**

For the current residents of Redcliffs, and with the mitigation in place, it is highly likely that there will not be a significant amount of psychological stress and/or distress as a result of a return to the old school site. That will be influenced by how confident, engaged and empowered the community feels about the mitigation measures. How this is communicated to the community is the key. Given the level of engagement and trust the School and the School Board has with the community, I believe it is possible for that to be achieved.

Dr Harith Swadi, MB ChB, MRCPsych, MPhil

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29 August 2016