Painted Apple Moth Eradication Campaign
West Auckland

Interim Report

of the
Community-based health & incident monitoring
of the aerial spray programme

January - December 2002

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INTRODUCTION

This is the second major eradication programme within five years, involving the aerial spraying of the pesticide Foray 48B over an extensive urban area of Auckland to eradicate an incursion of an alien pest.

The Eastern Suburbs campaign against the White Spotted Tussock Moth (WSTM) was conducted between October 1996 and April 1997, resulting in successful eradication.

The current infestation of the Painted Apple Moth (PAM) was first discovered in a small area in Glendene, West Auckland in May 1999. It has since spread to infest an extensive urban area of Waitakere and Auckland Cities. The Ministry of Agriculture & Forestry (MAF) commenced eradication with ground spraying in May 1999, with aerial spraying finally resorted to in January 2002. Both ground and aerial programmes are still in progress.

The extent and duration of this aerial pesticide campaign on an urban population is almost certainly without precedent for a non-public health spray programme. The area involved has increased in incremental jumps over the past year. From a targeted spraying of 500 hectares of riparian margin in January 2002, it has risen to the current 10,000 hectare blanket spraying of a resident population of over 150,000 people.

There has been considerable community concern from the first aerial spray that adverse health effects have been trivialised, discounted or dismissed, while the social and economic impacts on the community have not been acknowledged in any form.

The Painted Apple Moth Community Coalition (CC-PAM) was formed in June 2001 in response to the news that the eradication programme was moving into an aerial spraying operation. The community-based group was designed to enable public participation and input into the decision-making process, and ensure health protection was a prime consideration.

When the group became aware that the same problems experienced in the Tussock Moth campaign of under recording and devaluation of health effects were occurring, CC-PAM in conjunction with the then established Community Advisory Group (CAG), re-introduced the WSTM community-run health and incident reporting system.

This interim health and incident report is the first outcome of that undertaking. It presents the community's experience to date. It does not attempt to determine plausibility of effects, or prove causal relationships between the spray and presented symptoms. The report simply accepts, summarises and presents the actual events, effects and patterns of symptoms as experienced and reported by the community.

At this point, when there appears to be no end in sight to the aerial spraying programme, it seems right to publicly acknowledge the community experience. Letting everyone know they have been heard, that their experience has been recognised as valid and that it will not be ignored or swept under the carpet, is fundamentally important and necessary.

ACKNOWLEDGEMENTS

This is the community's experience. To them must go the major thanks, for without them this is just another report. Thank you all for your patience and fortitude in getting your story to print. You have been heard, and you will continue to be heard.

Thanks to all my fellow members on the Community Advisory Group and CC-PAM. Your hard work and persistence in representing the interests of the community has been amazing. It does not seem right to single anyone out for special mention, for all have contributed in their own way to this report - but I am so grateful for the sterling support and research done by Zelda, the liaison efforts of Annette Fenton with Waitakere City Council, and the support and encouragement of Meriel Watts. Thank you Kubi for hanging in there for everyone, and Meredith and our two Sharon's for the 'fingers on the pulse' support.

There has been a huge amount of effort put in by so many to bring the experiences of the community into the light of day, and special mention has to be made of the work of West Aucklanders Against Aerial Spraying (WASP). Helen has networked, liaised and kept everyone informed. Her phone, like mine has run hot from day one. Also Rachel, Sue B and Sue M, Alan, Terry, Jane et al, thank you. And Sally. When I should have been helping you, your support and help and wicked sense of humour has kept *me* going.

Final thanks are due to WASP for a $500 donation that has made the printing of this report possible.

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SUMMARY

The evidence that the aerial spraying campaign is causing significant and ongoing levels of health effects, problems and concern is beyond doubt. Adverse effects are far from trivial, minor or transient irritants as suggested by the Health Risk Assessments (HRA).

Three hundred and ninety seven incidents (397) have been reported to end of year 2002, with nearly 1400 specific effects detailed. These range from health complaints of an irritant and debilitating nature, through serious exacerbations of pre-existing conditions, to such severe effects that some people's lives and livelihoods have been quite simply devastated.

Further, it is evident that the non-health impacts of this eradication programme have simply not been taken into account or recognised in any form. The very nature and conduct of this aerial programme has impacted not only on the families of those people whose health has been directly affected, but also the community at large. Eighteen percent (18%) of specific incidents reported fall into this category. As with the health complaints they cover a broad range, from concerns at the disruption to children's schooling through to serious and worrying economic consequences. The effects of the spray on animals and pets have been detailed for the first time, and this report provides evidence of disturbing patterns of effects.

The reality of an intensive and extensive programme of aerial spraying in an urban area is that many vulnerable people cannot avoid exposure. The penetration and persistence of the spray in all buildings, and the inadequacy and difficulties of the relocation and evacuation programme has resulted in considerable disruption and distress for many people 'living life on hold'.

The difficulties many people face in getting recognition that they have been affected by the spray, is matched by the problems faced when assessments are free, but treatment and prescriptions have to be paid for. The economic impacts that have resulted are severe.

There is no doubt there is a very high level of anger and distress in the community about the spraying programme. Many reports detail the inability of the authorities to conduct the operation in a manner that allows people to avoid the spray or protect their families. The difficulties faced in trying to maintain a normal existence during a year of dislocation and disruption are considerable.

The value of a community-based monitoring system is recognised in the ability of people to record their experience in their own words without value judgement. Community monitoring and analysis will be continued, and funding will be sought to complete a full report and analysis of the effects of the aerial spraying programme.

1.0 BACKGROUND

1.1 MAF health surveillance and support

After the announcement that targeted aerial spraying was to be used in an intensified eradication programme, a MAF sponsored Health Steering Group (HSG) was formed. The HSG determined that a health surveillance study (monitoring) should be done during the programme, and that a Health Risk Assessment (HRA) of the aerial spraying with the pesticide Foray 48B should be updated. This was eventually commissioned from Auckland District Health Board (Public Health Service), and a draft was issued in November 2001 followed by the full report in March 2002.[1]

Whilst this assessment was an update of the 1997 White Spotted Tussock Moth (WSTM) HRA, the 1997 aerial spray programme never went ahead. Consequently the HRA has drawn on the 2001 health surveillance report by Aer'aqua Medicine Ltd of the 1996-1997 WSTM programme of aerial spraying with Foray 48B[2].

Possibly as a result of intensive community concern and lobbying by the Community Advisory Group (CAG) and Waitakere City about the health risks of the aerial spraying, the health monitoring study was expanded to include 'advisory' support. By the end of the year a reporting system was set up and pre-spray registering of health concerns with the MAF appointed consultants, Aer'aqua, was available to the community via an 0800 hotline.

As the spray programme got underway, health advice was published, and free appointments with MAF doctors were available to residents if it "was determined their health concerns required further investigation". The Health Monitoring and Support service expanded to cater for hundreds of people assessed at two local medical centres.

Evacuation programmes were put in place for those considered vulnerable to the spray. This has two arms; the provision outside the spray zone of early morning breakfast venues on spray days, and overnight or extended accommodation for those unable to return home because of spray persistence.

While the Health Programme offers free visits to MAF doctors and specialists for advice and assessment, it specifically excludes treatment. Patients have to return to their GP for prescriptions and treatment of any spray reaction or effect. This cost has been borne by the patient.

1.2 Community-based health & incident monitoring

Since indications of an aerial spray programme were publicised in mid 2001, community advocates and groups were fielding queries and concerns about the spraying. By the time

[1] Kalemba et al. Health Risk assessment of the 2002 Aerial Spray Eradication Programme for the Painted Apple Moth in some Western Suburbs of Auckland.
[2] Health Surveillance following Operation Evergreen: A programme to eradicate the white spotted tussock moth from the eastern suburbs of Auckland. Report to the Ministry of Agriculture and Forestry. May 2001

spraying was underway, reports and complaints were being recorded by a number of individuals and community groups.[3]

Whilst the major reason for detailing all incidents was ensuring people received the help and support they needed, it soon became obvious that health concerns were being dismissed, and spray experiences trivialised or rejected by MAF doctors. Many people were not even reporting their problems to MAF.

Realising that the same patterns experienced in the 1996/7 programme of official under-recording was a likely result, the importance of an independent record was recognised. It was decided to re-introduce the community-run health and incident reporting system, originally initiated by The Society Targeting Overuse of Pesticides (STOP NZ) during the Tussock Moth spraying. As a result the Community Advisory Group and CC-PAM jointly reissued an incident report form and a recording system was developed.

As the spray programme expanded exponentially both in duration and area, the volume and severity of the adverse reports also increased. As MAF official and Ministerial media pronouncements became ever more dismissive of any spray effects at all, the need to publicly acknowledge the community experience of adverse effects became vital. It was decided to issue an Interim Report of the community-based monitoring as recorded to the end of 2002.

2.0 SUMMARY OF SPRAY-RELATED INCIDENTS

2.1 Data source and collection methods

The health and incident reporting system, and the records in the ongoing database have been kept deliberately flexible and broad. The incidents recorded are passive, unsolicited, self- reports from the community, via a number of sources. These include not only direct contact with the author, but telephone, email and personal contacts with the CAG, members of other groups, Waitakere City Councillors and community representatives.

Media reports and public knowledge that the author was involved in the Eastern Suburbs spraying as the spokesperson for STOP resulted in the bulk of the early contacts from the community, and the first recordings were simple notes of the telephone contact. When the recording system was developed these original contacts were added to the 'database'.

The STOP Health & Incident form was amended, and made freely available on request via email or post and subsequently on a web page developed by one of the community groups.[4] CAG members had an email copy, and another community group West Aucklanders Against Aerial Spraying (WASP) made the form available to its members.

[3] A strategic alliance of The Society Targeting Overuse of Pesticides (STOP NZ) and the Toxins Awareness Group (TAG West), resulted in the formation of the Painted Apple Moth Community Coalition (CC-PAM). The formation of the Community Advisory Group (PAM-CAG) in September 2001 drew in representative members of these groups. West Aucklanders Against Aerial Spraying (WASP) was subsequently formed.
[4] www.geocities.com/no_spray/

Apart from one pharmacist in the spray zone requesting copies for its customers coming in for homeopathic remedies for spray-related complaints, the form is not lodged or advertised in any public place in the community.

The need to record experiences and effects in people's own words was fundamental in not issuing standard public health type incident forms, and people are simply asked if they would confirm their experiences in their own words, whether on the form, or by email or letter. No follow-ups have been undertaken.

2.1.1 Database

Reports from all sources (including media published letters and stories) have been received by the author on an ongoing basis and cross-checked for duplicates. Where this has occurred the individual reports have been recorded and merged under one reference.

For the purpose of this Interim Report, all incidents received to date were given a reference number and entered onto a database. Time and resources precluded a more comprehensive system and this database simply records the abbreviated or summarised details of the incident coded into four areas: pre-spray or vulnerable concerns, spray-affected, animal and other (general, environmental, etc). Alphabetical codes identify whether the spray related health incident refers to a male or female, child or senior citizen, and if it is anecdotal. No names or personal details are recorded.

In addition, where necessary to protect privacy or prevent the identification of any individual or institution, changes have been made to the text, or items omitted. To prevent doubling-up or multiple reports of the same incident, no report has been included if identification could not be made or verified. Anecdotal reports of a 'many people' nature have been included if they have identified the place or are clearly separated in time and space.

The records to end of year 2002 have been tabulated and sorted into reported symptoms and effects (Tables 1 & 2). To enable comparison and future analysis, these have roughly followed the classification system used in the Health Surveillance Report of the Tussock Moth spraying.

2.2 Patterns of reporting

The community-based record does not pretend to hold details of all the people affected. Far from it. In fact it should be assumed that significantly more people have been affected than those reported here, as there is a tendency not to report incidents when little help can be obtained. But the patterns of reporting provide some answers, and clearly illustrate a 'cause and effect' progression.

As the aerial spray programme has expanded, so the numbers of people exposed to the spray have increased. There is an initial flurry of contact following a first spray with reports of acute or instant reaction. The subsequent spray picks up first reports from people who have had a repeat reaction and realised it *was* spray-related. Following sprays bring in first reports from people worried that symptoms they had dealt with have worsened with each exposure, or have become prolonged or chronic.

As exposure continues with ongoing sprays, reports begin to come in from people with serious health problems who have gone through the MAF health 'system' and have not been supported or helped. By this time second contacts are being made from people whose conditions are deteriorating or who are no longer able to cope with their problem without help.

A critical point finally appears to be reached in communities where adverse events and reactions become common knowledge and 'everyone knows someone who has been affected by the spray'. At this point, people encourage others to report their adverse reactions and reports are coming in from all groupings as noted above.

Finally, the protraction of the aerial spray programme with its lack of end point, brings with it its own effect, and reports from those who have endured a year of spraying are increasingly of a desperate and despairing nature.

2.3 Symptoms and effects

Table 1 groups 1,397 reported spray-related incidents and symptoms from 315 people. The most frequently reported health symptoms are from the respiratory system, followed by neurological and digestive effects. Eye and skin complaints follow closely. The fact that 'general' health symptoms and social effects together make up nearly the same total as these most frequently reported effects, belies their impression of 'non-effects'.

The high totals for individual symptoms within the respiratory system reflects the fact that people rarely report single effects within this category. This is in comparison with neurological effects where headaches comprise nearly 70% of the total. As will be seen from Table 2, headaches are in fact the most frequently reported single symptom.

Eye complaints are the next highest individual symptom reported, followed by coughs and sore throats, demonstrating the prevalence of respiratory effects. Total fatigue symptoms are within this range too at fifty four reports, and are mirrored by equal reports of a 'general' sick/unwell nature.

Following closely behind in frequency, is the first appearance of an unclassified category. That forty four people reported serious health symptoms or conditions they had never had before exposure to the spray, has much to say about the relevance and significance of recording actual community experience and effects. This relevance is further underlined by the number of reports of animals and pets also being affected by the spray. The incidence of these would not be recognised in any classification of human effects, but contribute to the physical and mental costs of those living in spray areas.

The degree of anxiety about health concerns is magnified in the large numbers of complaints about the inability of authorities to conduct the campaign in a manner which allows avoidance and protection of a vulnerable population. That complaints about 'MAF' only just fall short of being the most frequently reported event is significant.

Psychological effects of stress, distress and anger follow on from this anxiety about being vulnerable and powerless, and even the high levels of these symptoms recorded here are strongly under-represented. It has been noted by everyone involved that taking the step to

report effects and incidents is invariably initiated by anger and distress even when not directly expressed. As such, these psychological symptoms would be the most frequently experienced adverse effect. When this is coupled with the high number of reports of people experiencing serious financial consequences from the spraying programme, the indirect impact of the eradication programme is painfully visible.

2.3.1 Table 1: numbers of spray-related incidents

The following table lists the number of all spray-related incidents and health symptoms reported from 315 people to end of year 2002. Symptoms and incidents are totalled for each category and sub-category, and listed by frequency within those categories. Where a symptom reported is of a 'many people' nature, the total is increased by one. No repeat episodes of a symptom have been included.

TABLE 1	Community reported spray-related incidents			
Respiratory	**329**	cough		55
		throat sore / painful / burning		53
		asthma aggravation		41
		breathing difficulties		35
		nose - congestion / runny		23
		nose - sinusitis		21
		chest pain		20
		general		18
		nose - bleeding		17
		nose - sore / painful / burning		11
		asthma new		10
		infection		9
		nose - sneezing		6
		smell		4
		hay fever		3
		loss of voice		3
General	**291**	sick/unwell		52
		fatigue		54
		lethargic	27	
		wiped out	17	
		Sleepy/dopey	4	
		chronic	3	
		drowsy	3	
		anxiety - health concerns		49
		allergy/skin disease	26	
		sensitised	8	
		other	9	
		spray sensitised	5	
		eastern sub experience	3	
		anaphylactic child	2	
		tank water	2	
		respiratory	2	
		unclassified - never had before		44
		flu-like symptoms		22
		mouth / tongue / lips		19
		hospitalised / A&E		14
		unclassified - symptoms in garden		9
		allergy - sensitised		8

General Cont.		unspecified		8
		anaphylactic collapse		6
		poor health		6
Social	**253**	MAF - complaints about		81
		no spray warning / zoning wrong /caught in spray	32	
		discounting symptoms	30	
		no information	12	
		not responding	7	
		pets / animals etc affected		38
		affected work / time off /sick leave		34
		worried about money / treatment cost		26
		environment effects noted		20
		had to move house		14
		environment concerns		13
		organic garden concerns		7
		worried about their children		6
		lost job		5
		worried about pets /animals etc		6
		affected business / closed / moved		3
Neurological	**128**	headache		86
		dizziness / losing balance		17
		lightheaded / spaced out / fuzzy headed		7
		difficulty concentrating		6
		disorientated /drugged		6
		numbness/tingling		3
		convulsion		1
		palsy		1
		restless		1
Digestive	**109**	diarrhoea		35
		nausea		22
		stomach pains/cramps/upset		21
		vomiting		17
		like 'food poisoning'		3
		loss of appetite		3
		bowel bleeding		2
		irritable bowel		2
		liver		2
		thirsty		2
Eye	**78**	general		61
		conjunctivitis		13
		ulcers		4
Skin	**78**	rash		26
		rash localised		21
		itch		17
		burning		7
		eczema aggravation		4
		wounds won't heal		3
Psychological	**77**	distress		33
		anger		18
		stress		10
		panic		5
		depression		3
		insomnia		3

		irritable	3
		aggressive	2
Musculoskeletal	**13**	musculoskeletal	13
Pregnancy	**12**	concerns	6
		miscarriage	6
Circulation	**10**	temperature	6
		blood pressure problems	2
		heart rate	2
Endocrine	**9**	hypothyroidism	1
		glands	8
Ear	**7**	ear	7
Urology	**3**	kidney / bladder	3
		TOTAL INCIDENTS & REPORTS	**1397**

2.3.2 Table 2: frequency of spray-related health symptoms

The following table lists the frequency of individual spray-related health symptoms across all the categories in Table 1. Single digit symptoms have not been listed.

TABLE 2 Health Symptom frequency

neurological - headache	86
eye - general	61
respiratory - cough	55
respiratory - throat sore / painful / burning	53
general - sick/unwell	52
respiratory - asthma aggravation	41
digestive - diarrhoea	35
respiratory - breathing difficulties	35
psychological - distress	33
general - fatigue - lethargic	27
general - anxiety - allergy/skin disease	26
skin - rash	26
respiratory - nose - congestion / runny	23
digestive - nausea	22
general - flu-like symptoms	22
digestive - stomach pains/cramps/upset	21
respiratory - nose - sinusitis	21
skin - rash localised	21
respiratory - chest pain	20
general - mouth / tongue / lips	19
psychological - anger	18
respiratory - general	18

digestive - vomiting	17
general - fatigue - wiped out	17
neurological - dizziness / losing balance	17
respiratory - nose - bleeding	17
skin - itch	17
eye - conjunctivitis	13
musculoskeletal	13
respiratory - nose - sore / painful / burning	11
psychological - stress	10
respiratory - asthma new	10

3.0 PORTRAITS OF SPRAY-RELATED INCIDENTS

3.1 Introduction

No acknowledgement of the *actual* community experience and individual impact of the aerial spray programme can be covered by numbers and statistics. Indeed statistics are often used by authorities and commentators to further belittle experiences.

But they have served an introductory purpose in this report by preparing the ground for the human experience behind the numbers. They also serve to illustrate the reality as opposed to the expectations and predictions detailed in the Health Risk Assessments, public advice and ministerial statements. This section has therefore continued this process and has adopted introductory statements from the HRA or other published advice for comparison.

It is also appropriate at this point to acknowledge the people whose stories and experiences are this report. All respect and honour is due everyone who has given us a part of their lives. Space precludes including everyone's story here, but we hope that everyone will recognise a part of themselves and their experiences in the representative accounts.

3.2 Health Risk Assessment (HRA) - 'Safety' of Spray

The main conclusion of the HRA was that Bacillus thuringiensis var kurstaki (Btk) - the active ingredient in the Foray 48B spray - has never been implicated in human infection in 35 years of use. The rest of the inert spray ingredients (97%) are registered for use, and the levels used in the spray "are acceptable". The HRA did accept that there would be minor effects of an irritant, annoying and stressful nature, but concluded that "the risks to human health from the combined components of the possible spray programme are small". [5]

The publication of the HRA was accompanied by press releases and public health advice. All without fail adopted the position that the spray had been given the all clear and a "clean bill of health".[6] Further comments that the spray components had never caused human infection, only kills caterpillars, and is harmless to people and animals were also repeated

[5] Kalemba et al. Health Risk assessment of the 2002 Aerial Spray Eradication Programme for the Painted Apple Moth in some Western Suburbs of Auckland: p4,56.
[6] MAF press release 14.1.02, 21.1.02

in subsequent adverts and published advice sheets. [7] As will be detailed in this section, the community's experience contradicts this assessment.

3.3 General - Operational advice & exposure level effects

3.3.1 We recommend the spraying be limited to targeted high risk areas. (HRA p63)

Any aerial spraying will be restricted to the use of less intrusive helicopters, and limited to a smaller area. (HRA p49)

The HRA is based on a one day helicopter aerial spray every three weeks of 500 hectares of a targeted riparian margin and high risk areas for 6-8 sprays. As additional outbreaks were discovered outside the targeted area, the spray zones were extended hectare by hectare up to the permitted 900 hectare limit. By the sixth spray a small fixed wing aircraft was also needed to deliver the pesticide, and when the spray area jumped to a blanket spraying of 8000 hectares in October 2002, a large Fokker Friendship plane was added to the operation.

As two further incursions were detected outside the buffer zone, there was a rapid increase in area to 8,500 and then 10,000 hectares by the end of 2002. These two new incursions (hot-spots) together with five persistent hot spots are now getting extra sprays on a weekly basis, as well as the double spray they receive during the blanket operation. (Heavily infested areas get a second spray with a larger droplet size to maximise coverage).

The HRA estimated a resident population of 13,521,[8] with four schools and seven early childcare facilities within the 200 metre buffer (drift) zone. Current resident population being sprayed is in excess of 150,000 with 260 schools and early childcare facilities in the spray zone.[9] The number of people who move into the area on a daily basis to work or go to school is unknown.

At no time has an updated HRA been issued to address these changed risks as detailed above.

3.3.2 The residents and those entering the spray area may be exposed to the spray for a short period of time during and after the time of the actual aerial spraying. (HRA p43)

Spraying should be conducted at times of day to minimise human exposure, for example avoiding times when children are walking to or from school. (HRA p63)

The reality of aerial spraying in an urban area is that nowhere is 'safe'. You can minimise but not avoid exposure. Drift, exposure and persistence levels have never been measured or recorded in this programme, as detailed by two previous CC-PAM reports.[10] Spray penetration and persistence in all buildings mean many residents will be exposed to spray components twenty four hours a day over extended periods.

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[7] West Weekly 19.12.01; Waitakere City News; Foray 48B fact sheet (MAF & Auckland District Health Board)

[8] Over estimated, as some demographic meshblocks used extend beyond the 200m buffer zone.

[9] MAF communications manager, Melissa Wilson - 28.1.03

[10] (a) Blackmore H. "Aerial Spraying against the Painted Apple Moth - Btk pesticide exposure, spray drift and environmental persistence. November 2001.
(b)Blackmore et al. Exposure Risks for Schools during the Painted Apple Moth Aerial Spray Programme. February 2002, updated October 2002.

Report after report notes a return of symptoms when residents re-enter their homes after being absent during spraying. Some exacerbations have been severe and debilitating.

> *"Came back home at 11.45pm - smell was in the house from the spray. Eyes started to sting, skin started to feel as if it was on fire and itch like mad - had cold shower but half an hour later skin continued to burn and itch"*

> *" ...(this time) I immediately evacuated the area with my son ...we stayed away until 6pm - (spray stopped at 12.30). I opened the windows for 3 hours - went away again and returned at 9pm. My son and I started to feel ill. Our nose and eyes were burning. I started to get a sore throat and then couldn't breathe. I had a pain in my chest and felt sick. We had to leave again and slept away from the house… on returning I could still smell the spray in my house"*

Dozens of reports have been received of people being sprayed several times during any given spray day. This is to be expected with two or three aircraft operating simultaneously over such a large area, and the spraying day extending well beyond the 7.30am halt time of overseas programmes.

Even with the smaller targeted areas, winter operations meant daylight lift off time was much later and finish times usually extended into late morning. Rising winds and temperatures often curtailed these sprays, and operations over several days were necessary, adding to exposure levels from both direct contact and drift. The 13 sprays completed to end of 2002 have actually taken 27 days (not including the additional hot spots sprayed on a weekly basis since November 2002).

Reports note many people sprayed at home as well as schools and work places later in the day. In some cases, journeys to and from work places also go through spray zones. Some homes near heavily infested gullies and hot zones, which receive an extra spray from the helicopter, can record up to five sprays each series. This is a particular problem at 'cross-over' points where spray runs change direction.

> *"Helicopter came at tree top over my and adjacent properties TWICE (despite advice from MAF that it would never be done) and sprayed my house and garden twice."*

> *Property sprayed early morning and again after told spray over. Not told gully alongside was going to be sprayed again. Complained to local MP who is told by MAF that it was pilot error. Very angry.*

> *"Never in our life have we suffered from asthmatic type symptoms, but now we both do. I counted nine times the helicopter flying over my property spraying ... if you didn't know better you would have thought that they were trying to give us swimming lessons in the stuff. Everything we own is heavily coated in this poison and this is after MAF agents who inspect our property most weeks (or sometimes fortnightly) have not found any moths on or near this property for the last 3 months. So if they are not killing moths, what are they trying to kill?"*

> *Resident complained that plane came over number of times on a second spray run after already receiving an early morning dose. Car absolutely covered.*

Overlap of spray swathes is frequently reported. One parent recorded spray deposition on her stationary car from three successive passes of the Fokker plane. Schoolchildren waiting on the station platform opposite would have received all these sprays.

Even starting at first light, MAF are unable to complete spraying before children are walking to school, as detailed in the updated CC-PAM report to schools in October 2002. When MAF amended their spray times to avoid spraying between 8.00 and 9.00am, this still did not recognise that some children were on the road as early as 7.00am, and spray drift may not settle for hours.

Much of the high levels of anxiety, anger and stress relate to the exposure of school children and the inability of parents and teachers to keep children safe even at school. Apart from individual parents concerned about their child, many of the anecdotal reports are from the community upset at witnessing children being sprayed or panicking at being caught outside during overpasses of the Fokker plane.

> *Upset at seeing people and children walking along West Coast Road being sprayed - when not supposed to be in spray zone.*
>
> *Mother home with sick child had to send 7 year old across to school on own - is horrified to see him nearly run in front of a car in his panic to get across the road and into school when frightened by the helicopter suddenly appearing overhead and spraying.*
>
> *"I cannot believe that the experience I had today of the spraying programme is going to happen fortnightly for the next three years… a student I was with during the spraying at our school was traumatised to the point of panic every time a plane flew over … why should planes have to fly low over schools? During the lunch break students were outside eating their lunches while the spraying was happening. They were not allowed to be indoors."*

Perhaps unsurprisingly, there have been a considerable number of teachers reporting concerns about the exposure of their pupils to the spray. Their fears have been compounded by the fact that they themselves had unexpectedly got sick after the spray. Many reports from childcare establishments note not only sick children but staff as well.

> *"I work at … school and made sure the windows were closed, but the school did not advise students to stay inside. I was not expecting any effects myself, but over the weekend I developed extremely irritated eyes, watery with pus in the tear duct as well as fluey symptoms and sinus congestion headaches."*
>
> *Notes lots of kids off school with nosebleeds, coughing, headaches.*
>
> *"All the kids at the …childcare centre have eye and skin problems".*
>
> *The supervisor reported that nearly everyone there (workers and children) had experienced health effects, especially conjunctivitis - that they had never had before.*

3.3.3 Residents should be advised in advance of spray times so they can avoid direct exposure if they wish. (HRA p64)

While spray days may be announced in advance - always *weather permitting* of course - it has been found that spray times are dependent on so many variables from weather to sun-strike to operational changes etc, that being able to avoid direct exposure is only possible if the resident leaves the area completely. In addition, as noted above, with three aircraft operating at the same time even small journeys may take people from an unsprayed home zone directly into the path of another area operation.

Further, the inability of the 0800 staff to have timely information to keep track of all aircraft movement throughout the operation, has resulted in many frustrated and angry confrontations. Many residents have reported calling the 0800 number to tell *them* where the aircraft is spraying after inaccurate information has been given out.

> *Told not in spray zone but got sprayed on anyway. Two year old child developed 'horrendous' rash - sore throat and coughing after spraying.*
>
> *Complaint from parent that child's primary school outside zone is sprayed. Children all coming home with streaming eyes.*
>
> *Upset unable to get accurate up to date info from hotline to keep family safe - kept children home after previous spraying when they all came home sick after spraying - got five different stories when rang hotline - 3 yr old developed asthma again after spray.*

Many of the high number of complaints about MAF relate to this inability to keep people informed, but when exposure could have serious health consequences then avoiding direct exposure becomes vital.

> *Child suffers from severe allergies and extreme chemical sensitivity - Anaphylactic allergies are airborne. Goes to School in the drift zone. Skin clear for six weeks before spraying started. After sprays now eczema gets worse - only cleared up after bad weather & rain. Keeps child off school on spray days - but was caught out as they sprayed after saying they wouldn't. Took child out of school as soon as happened but child's skin broke out by afternoon.*
>
> *Asthmatic child put at risk. Got sprayed while doing school crossing duty - said could feel and taste the spray in the air - skin stingy all day - fortunately did not have asthma attack, but should not have happened … school adamant that they had not been notified of spraying.*
>
> *Very upset at MAF's inability to give accurate and up to date information about spraying progress so that can avoid spray … husband is a chronic asthmatic and severely affected by the spray. Told spraying was finished so went out and got caught in a direct spray.*

3.4 Respiratory system effects

3.4.1 The likelihood of exposure to the spray causing an asthma episode in a member of the public is considered negligible. (HRA p44)

> **While very small amounts [of inert ingredients] may be inhaled, adverse health effects have neither been reported nor are they expected**. (HRA p44)

As detailed in the tables the most numerous health symptom reports are from the respiratory system, and individual symptoms feature high on the frequency table. Excluding asthma aggravation, coughs, sore throats and breathing difficulties make up 32% of the top ten effects.

Contradicting official expectations of a low or minor irritant effect, the majority of reports of all symptoms are of a significantly troubling and debilitating nature. Onset is usually immediate and persists for some time. Breathing difficulties are common with 35 reports. An additional 10 reports note the development of asthma. Coughs are severe - often likened to whooping cough, with several reports of loss of bladder control.

Sinus and nasal congestion is commonly reported as severe, with several reports noting inner ear involvement with such painful pressure it was likened to the same feelings experienced in descending aircraft.

Nose symptoms were reported across the range as being worrying (bleeding) and painful (sores, ulcers, burning). The majority of the 17 cases of bleeding noses are not reported in children as might have been expected, but in adults, most of whom reported they had never experienced this before.

It is of interest that there were two reports of doctors discounting coughs and breathing problems as 'not from the spray'.

> *Child developed sudden onset of coughing that couldn't be stopped - had to be urgently taken home. Doctor diagnosed an allergic reaction to the spray.*
>
> *After spray ...slight cough by evening. Over next few days cough got progressively worse until so severe experiencing dry spasms 'like whooping cough' - so bad caused stress incontinence. After fifth day chest very sore and painful - then began producing constant heavy nasal and throat mucous - felt as if drowning and difficult breathing through it - all symptoms still present 10 days after exposure. Fit and healthy - "rarely has colds - coughs never'. Two weeks later has developed severe nose bleeding - painless sudden flow, bright red. Never had a nosebleed in life.*
>
> *Nine year old child - previously perfectly healthy - now has asthma attacks since the spraying started.*
>
> *Developed an itchy throat, cough. So bad GP put on antibiotics for first time in 20 years. Normally very healthy. Then flu-like symptoms, runny nose, nosebleed, tired, swollen eyes, burning skin on face, restless. After ground spraying return of swollen burning eyes and burning skin, nosebleed.*
>
> *Outside during a spray - on way home, developed tight chest, difficulty breathing with sore throat nose and eyes. Several days later was working outside in spray zone and had repeat of symptoms. Subsequent sprays kept away during spraying but had repeat of symptoms when entering buildings in spray zone. Never had allergic reactions to sprays before. Blood tests taken by GP after each incident confirms immune reaction.*
>
> *Perfect health till spraying started. Experiencing chest pains, nausea, raw throat on spray days, headaches. Never had asthma before but asthma attacks now since spraying began.*

3.4.2 Asthma NZ say that asthma & allergies resulting from contact with the spray are 'extremely rare' but sufferers should avoid inhaling spray particles as they may irritate their sensitive airways. (Asthma NZ - PAM fact sheet)

> **We do not expect toxic effects or infection .. though if directly exposed to the spray or substantial spray deposits some people may complain of …upper respiratory tract irritation, or aggravation of existing asthma or allergies.** (HRA p61)

Aggravation of asthma cannot be considered 'rare' in this spraying programme. Just the level of reports of the return of asthma in children where it was thought they had grown out of it, or was under control, is worrying enough. But the number of adults who are struggling to manage their asthma in the face of worsening control at every repeat spray cannot be ignored.

Asthma aggravation is the sixth most commonly reported symptom of the spraying, and considering the seriousness of this condition, and the costs of both medication and the levels of professional care required, 41 reports should be a matter of concern.

> *Chronic asthmatic - works in the spray zone and has noticed a drastic decline in the control of asthma since spraying - seeing specialist. Lost considerable time & money with time off work sick and to avoid the spray. Has had to close down consulting business and relocate at considerable cost.*
>
> *Asthmatic previously well managed - no attack for 3 years, had a prolonged asthma attack that lasted 3 weeks after aerial spray. Did not know in expanded zone - no info from MAF - first knew was when woken up by plane spraying overhead. Immediately rang 0800 line to be told by operator that the spray was safe for asthmatics. Says support people been very helpful, but are downplaying any link between asthma and spray. Is concerned that is now vulnerable and motel evacuation will present with more triggers eg dust mites Now on a higher regime of medication and has not been able to work for 4 weeks - still unwell and respiratory tract still has spasms and can't talk properly.*
>
> *Health worsening each spray - asthma now severe - can't walk far now and has to use inhaler. Chest pains getting worse each spray and lasting longer … Very concerned about job - only part-time but never knows when will be able to work - very hard on employer.*
>
> *Had been a mild asthmatic until spraying started. Felt vulnerable so evacuated voluntarily during first spray. After first spray started wheezing. Second spray sees MAF Doctor. Told no need to get out of home - but gets asthma which intensified four days later. Never had asthma this long in life – 3 weeks. Was prescribed nebuliser treatment and ventolin by GP - but ended up having to buying own nebuliser. Now frightening levels of asthma. Wakes in night with breathing difficulties. Had to be taken to emergency services. Severe asthma attacks 3 or 4 times after each spray. Has lost job ten months after start of spray programme - believes in part due to number of sick days taken. Huge problems now with need to find work outside spray zone - and limited finances. Expenses to date for this year have been severe.*

3.5 Neurological effects

- **There is no significant evidence that Btk will cause neurological or autoimmune effects.** (HRA p41)
- **Health surveillance following the (Tussock Moth) spraying revealed no increase in presentations to GPs for headache symptom … following spraying.** (HRA p35)

The above statements bare little relationship to the reported experience of the community, in which a neurological symptom - headache - tops the table of symptoms. The use of the Tussock Moth 'evidence' should not go unchallenged. Whilst the statement may be technically correct with regards to presentations to GPs, it is also highly misleading. Most people do not go to a GP with a headache, and at sixty four cases, headaches were in fact the most frequently reported health symptom in that aerial spray programme as well.

It is also of interest that the HRA further 'discounts' the significance of headaches. It notes the spray has a strong smell, and recognises that offensive odours can give some people nausea, headaches or other symptoms. But it qualifies this statement by saying that even though these symptoms may be experienced "there is no harm being done." [11]

[11] Kalemba et al. Health Risk assessment of the 2002 Aerial Spray Eradication Programme for the Painted Apple Moth in some Western Suburbs of Auckland: p43.

It is not necessary to attribute cause to recognise that any adverse effect, whatever its origin, is significant if it is being experienced. The fact that 86 people have reported headaches, and a number of the anecdotal reports of a 'many people' nature fall under this category, would suggest that the community experience is indeed significant.

> *Told by a staff member in a large retail unit in the spray zone - that 'nearly all of us have got headaches in here'.*
>
> *Everyone at work reporting how sick they had been from the spray - pharmacist in City prescribing for severe headache asked where patient from. On being told West Auckland, commented that 'there have been a few people coming in with similar stories'.*
>
> *Concerned at number of colleagues and friends reporting range of so-called 'minor' problems on October spray day. Ranged from headaches to sore throats, stress and light-headedness.*

Headaches often accompany other symptoms, but many headaches are described in reports as severe and persistent, and definitely not 'minor'.

> *Twelve year old child in spray zone been unwell for 3 weeks. Really sick with extreme tiredness, bad headaches. Off school a week which was spent lying around very 'droopy and easily upset'.*
>
> *Caught in spraying on way to childcare – headache - sore eyes since then - itchy & gritty. Headache usually lasts a day - taking really strong Panadol - nose bleeding.*
>
> *Works from home in spray zone. Has three day headache after spraying - developed stomach pains/vomiting subsequently. Work severely affected as has to leave home on spray days. Will sell up and move if spraying continues.*

A significant number of other neurological effects have presented themselves as will be noted from the tables - and as with headaches - usually in conjunction with a range of other physical and psychological effects. Thirty-six reports detail symptoms from dizziness and losing balance to 'spaced out', fuzzy headed and disorientated effects.

> *Home sick since spraying - headache - feels 'fuzzy headed' even when doesn't have headache.*
>
> *Stayed inside on all sprays - normally healthy but within 10mins of plane overhead suffers terrible dizziness, then foul taste in mouth, followed by headache. This lasts from one to two days. Seen MAF Doctor - but told nothing can be done.*
>
> *Unwell since spraying commenced. Immediately after spraying stinging tongue, eyes itchy and sticky - vision blurred. Feels nauseated, dry cough to point of sore stomach. Feels weak, wants to sleep. Exhausted, floaty and disorientated. A couple of days later joint pains, feels as if going to pass out but doesn't. Balance unstable, walks into door jambs. tightness of chest and breathing difficulty. Anxious and on edge - stomach pains - difficult to work.*
>
> *Professional working in spray area. Had ME for 7 years - had started to feel better, in fact 'wonderful' before spray. On 2nd spray day - arrived at work - suddenly started to feel extremely exhausted, fuzzy headed and confused. Couldn't think straight and wondered how was going to get through morning. Every small task seemed suddenly extremely difficult and felt disorientated. Continued to feel exhausted, confused and weepy all day, by evening started severe headache that felt as if tight band round head ... Worst symptom was not being able to breathe properly. Felt as if lung capacity severely diminished and something preventing breathing deeply. Wheezy sounds. Never had symptoms like this in*

life before. Skin also felt very itchy as if in contact with fibreglass - and burning in localised patches like paint stripper. Inside of nose raw and burning - persisting. Nose now streaming, eyes watery and coughing up a lot of phlegm …Is very angry and depressed.

"I feel as if I have run a marathon today, every part of my body feels so weak - also I am experiencing that strange feeling again, of loss of balance and the feeling as if my body does not belong to me. I seem to have no control of it, it's floppy and at the same time feeling very heavy and weary."

Previously diagnosed by hospital for ME after exposure to spray chemicals. Works in spray zone - since spraying is starting to 'lose her balance'. Experiences tingling from chin to eye that comes and goes - eye and mouth droop during stress. Query form of palsy.

Of particular concern is a handful of reports that these effects could have serious consequences. One fall was reported by a severely affected resident after a 'funny turn', which resulted in a severely torn knee ligament that required reconstructive surgery and months on crutches. Reports mention concerns about spray reactions when driving, with one woman reporting that she had already "pranged" her car twice, and another distressed after running over her own dog in the drive.

Sprayed in car on motorway - felt disorientated and sick.

"*My thinking was so poor that I drove down the wrong side of the entrance drive to Lynmall."*

Poor concentration is specifically mentioned as an adverse reaction to the spray, and the effect on work and ability to do a job. This is often linked with fatigue symptoms of feeling dopey, drowsy and sleepy.

"I am having great difficulty concentrating on my course … I am three exams behind now and I don't quite know how I am going to cope. I almost feel like quitting as I don't have the energy or the ability to concentrate any more. "

Suffering huge problems with loss of concentration - but just got to do job, so grits teeth and gets on with it.

Asthmatic - health has slowly deteriorated since spraying began in Jan. Works in area. Great difficulty breathing during spraying … had several bouts of flu-like symptoms, including headaches, persistent coughing, runny nose, itchy eyes, dizziness and feelings of nausea. Blurred vision - difficulty concentrating on even the simplest tasks.

3.6 Digestive System

- **The exposures that could result from [this spray] could not give rise to sufficient intake into the human body to produce any of the symptoms: flatulence; abdominal pain; or diarrhoea**. (HRA p44)

It is interesting that of all the bodily systems assessed in the HRA, adverse digestive effects appear to be considered as the most unlikely to occur. This may be because the only two routes considered possible have been considered (and dismissed) in the HRA as 'impossible': the risk of gastrointestinal illness from the active *Bacillus*, and excess oral intake of one of the inert chemical ingredients.

Yet the number of digestive symptoms and problems reported here is well in excess of figures for eye and skin complaints that the HRA *does* consider possible. Total symptoms recorded are 109 compared to 78 for both eye and skin problems. Digestive complaints have been consistently reported throughout the year, both as new symptoms and repeat episodes. The linking of spraying with the timing of the onset is particularly noticeable with diarrhoea, the most frequently reported symptom.

This condition is noted as either very bad - 'shocking' is often mentioned - or debilitating in the length of time it continues. Nausea, stomach pain and cramps also appear regularly in the reports, with and without diarrhoea, and acute bowel problems such as bleeding have been reported in severely affected individuals.

> *Fit and healthy - did usual early morning run shortly after spraying - been really sick since. Diarrhoea, headache, vomiting - diarrhoea still present 3 days later. No energy. MAF doctor said these weren't known symptoms of spray. Partner not affected with diarrhoea.*
>
> *"Up most of the night trying to breathe and sitting on the toilet - it seems everything I eat at the moment goes straight through me and the pain is so severe I am doubling up each time. My stomach seems to have blown up again and still this nauseous morning sickness feeling…. 2.00 am went on nebuliser, finally got to sleep around 4.00am."*
>
> *In spray zone - unwell for months. Within 24 hours every time they spray – 'shocking' diarrhoea. Bad chest. Used to walk long distances every day. Now can barely get up road. Terrible cough. Extreme tiredness. Doctors bills $200 which family had to help with. Can't get well with the repeat sprayings. Every time they spray get sick again.*
>
> *Fourteen month old child in spray zone. Ill after spraying - vomiting three times - diarrhoea. Well in self otherwise.*
>
> *Child has developed progressive problems since spraying began. After spray gets diarrhoea and stomach pains - bleeding nose, bleeding sinuses – never had before. Now sensitised reacts faster and worse each spray. Not asthmatic - but during last spray said he felt like he had 'a balloon in his throat and couldn't breathe'.*

3.7 Eye effects

- **We do not expect toxic effects or infection though if directly exposed to the spray or substantial spray deposits some people may complain of … minor eye irritation.** (HRA p64)
- **There is no significant evidence that Btk will cause corneal ulcers.** (HRA p64)

Leaving aside severe eye complaints such as conjunctivitis and corneal ulcers, general eye symptoms are the second most frequently reported spray-related effect. Apart from one report noted below of an acute reaction to the spray, it appears that eye problems are not related to direct exposure. Although reports often note early reactions of an itchy, irritated, stingy nature, even within closed buildings, the appearance of more serious conditions does not manifest until some time after spraying.

Descriptions of persistent eye effects are numerous: dry, sore, sensitive, red, itchy, burning, streaming, irritated and inflamed. Conjunctivitis often appears following sleep, or several days later, together with complaints and symptoms about blurriness of vision. Eyes are often described as if a film were over them. Sticky and infected eyes also do not appear until later - with several reports of people wakening with eyelids stuck together.

The severity of some of the eye effects experienced by the 78 people reporting, including corneal ulcers, belie the HRA 'minor eye irritation' assessment. The risk of corneal ulcers is dismissed by the HRA, based on one well documented 1980's case of direct eye trauma in a farm worker. The experiences recorded here suggest that indirect spray drift should be considered as well. The possible build-up or persistence of the spray in buildings would also explain the number of reports of many children in day-care centres and schools suffering from conjunctivitis and eye irritations.

> *14 yr old child has had severe conjunctivitis since beginning of extended programme. Antibiotics have not worked - now on antihistamine drops - but mother worried as has to double the recommended dose to just keep the blurriness at bay. To see MAF specialist. Spraying on exam day severely affected her - failed exam - teacher upset as doing so well until then. Mother worried about costs of treatment.*
>
> *"Sore glands again (neck), red and sore eyes, trouble seeing (as through a film)". Later on developed sticky eyes - left eye remains closed, film over eye, ulcer in corner."*
>
> *Since the spray programme started has developed severe conjunctivitis. No medication is of any help. May have to move out of the area.*
>
> *Had two ulcerated eyes since spraying. Samples taken from one for analysis. On breakfast evacuation programme because of other immune health problem.*
>
> *Two days after spraying awoke to find eyes were stuck together. Red and irritated. GP said that bacteria had got in and on antibiotics. Cleared 3 days later but remained dry and sensitive for a week. GP didn't seem to think it was spray-related - but never had eye problems before. Postscript - had a flare up 3 days later.*
>
> *Information from GP - patient caught in spray when thought spraying over. Looked up and spray on face - instant burning in eyes - rubbed - by time got to work eyes were like "pools of red blood" - developed itching and redness to eyelids - upper & lower bilaterally - diagnosed conjunctivitis - with watery discharge. Discharge caused severe red raw burning to skin on lower lid area - very painful to touch.*
>
> *Never had problems with eyes before - but woke after spraying with such swollen eye that could not see. GP diagnosed shingles of eye - had to have two days off work.*
>
> *Developed severe eye problem after spray. Eyes became very itchy, skin became red and inflamed. Developed bacterial conjunctivitis. In Auckland Hospital unable to open eyes or see clearly. Been tested for over 50 food and chemical ingredients at Auckland Allergy Clinic - all negative. Now evacuated during sprays and housed overnight. Very upset and angry that had to use all sick days up in treatment for something not of her making. Been told by MAF to avoid the spray, but now zone expanded is also working in spray zone. Cannot take time off as would not be paid and would have to take off annual leave.*

3.8 Skin Effects

- **We do not expect toxic effects or infection though if directly exposed to the spray or substantial spray deposits some people may complain of … minor skin irritation.** (HRA p61)
- **In most instances, the exposure (to spray) will be indirect leading to low doses to the skin, and will be unlikely to cause irritation.** (HRA p44)

Unlike the eye assessment, the HRA does at least accept there will be indirect as well as direct exposure to the spray, but still dismisses anything but a minor outcome. Of concern is the fact that like the eye effects, both the number and severity of skin complaints reported are far from minor.

Symptoms range from itchy, prickly, stinging, burning skin or rashes, to red, inflamed and weeping skin outbreaks. Rashes are reported as localised on eyelids, face, arms and exposed skin areas, as well as whole trunk and body outbreaks. Several people with no previous history of skin complaints have documented their rashes with photographs.

Staff at several childcare centres report numbers of children with skin rashes since spraying, and aggravation of previously controlled eczema in children is also noted. Effects are not confined to children, and many adults report a range of other skin symptoms.

Contact skin problems are noted from working or playing in gardens after spraying, though controversially (and without evidence) MAF doctors have suggested these were caused by the urticating hairs of the caterpillar.

A number of reports detail a re-occurrence or exacerbation of a skin rash or complaint after each spraying, including one rash serious enough to prevent a return home before 48 hours had elapsed since spraying. Once again, experiences recorded suggest that possible build-up or persistence of the spray in buildings should be considered as a serious route of prolonged exposure.

> *Has developed 'horrendous' facial rash which weeps constantly - clears up with a week of no spraying, but re-occurs after spraying. Cheeks main problem, but forehead and eyelids also experiencing scale-like problems and weeping. After prolonged spraying, rash spreads across top of chest and under arms and elbows. Has been away from the city on several occasions where skin clears up only to return with a vengeance on return to West Auckland. Has linked all skin outbreaks to sprays and is very concerned. MAF specialist later confirms that health problem "highly likely" to have been caused by spray.*
>
> *Contact with sprayed trees two days after aerial spray - cutting branches off - rash on arms, back where carried branches over shoulder. Rapidly turned to blisters. Rang 0800 - Dr from centre will ring - didn't - sees own GP - has to pay for treatment. On/off appts made and cancelled - finally seen in own home 2 weeks later. Rash virtually faded - but MAF Doctor says it was caterpillar hairs not spray. Cut branches still there - but no-one round to examine trees for larvae or evidence. Why not if it is so important to track down caterpillars?*
>
> *Susceptible to asthma/eczema but never had as bad since spray. Hospitalised at end of August for severe eczema - took week to stabilise. Still having UV treatment 2 months later. Used up all sick leave and had to take leave without pay causing financial problems. Hospital keen to test spray but say unable to get hold of components. Worried about spray as uncertain what might have caused problem. Not keen on fact keeps eczema at bay with steroid cream.*
>
> *Child in spray zone has had a severe allergic reaction to spraying on first two sprays. In spite of being kept indoors on both occasions - (both home and daycare centre is in spray zone) - has reacted hours after spraying ends. Has had severe facial eczema - the skin cracked and dried so badly that the top layer of skin peeled off. Has not fully recovered even 3 weeks later - plus nose running since first spray. Second spray developed itchy rash within 24 hours all over arms, neck, face and torso - very distressed. Local pharmacy diagnosed an allergic reaction to the spray. Still covered in bumpy spots and puffy eyes and runny nose 6 days later despite medication. Child not sleeping due to itch - has had to be kept off daycare as needs constant treatment.*

3.9. Other general health effects

> **"We have not identified quantifiable risks of specific diseases in association with the spray programme. However we would expect an increase in minor irritant symptoms, non-specific health complaints and anxiety …. " HRA p58**

As fatigue symptoms are not mentioned by the HRA it has to be assumed they fall into this category of non-specific health complaints. Added to 52 reports of an unspecified sick or unwell nature, 22 flu-like symptoms not recorded elsewhere, 19 mouth/tongue/ lip effects and a dozen poor health or anaphylactic incidents and it could well be that this assessment of an increase is reasonably accurate. Unfortunately they are not minor symptoms, and the baseline, over which an increase is expected, is not recorded in the HRA.

Fatigue symptoms appear regularly in many reports and if totalled would be the fourth most frequently experienced effect. Experiences of lethargy, feeling sleepy or drowsy could be a nuisance or debilitating, but many reports are far more serious.

> *Elderly lady has ongoing problems - difficulty coping with extreme tiredness.*
>
> *Never had such a set of symptoms before - felt like 'an immune response'. Was 'wiped out' for three days and had to go to bed to rest.*
>
> *Spraying making her 'so very tired' - had to lie down. Energy 'down the drain'.*
>
> *Present in area during spraying - felt 'absolutely wiped out'.*

Many people detailing other specific health effects also mentioned feeling generally unwell or sick. Simply coping with health problems or managing their lives during the spraying programme appears to be impacting on many people's overall well-being. Additional worries associated with serious health symptoms or conditions that people had never had before exposure to the spray, is evident. We would suggest that 44 people reporting new conditions they had never experienced before is a serious increase and a significant health concern.

3.10. Psychological/anxiety

- **We anticipate that an appreciable number of people will experience anxiety and anger before and during the spray programme.** (HRA p56)
- **On the basis of previous spraying programmes in Auckland, we expect an appreciable degree of anxiety in the exposed population.** (HRA p49).

As noted throughout this report, the HRA has downplayed and minimised the physical health risks of the Foray 48B spray, suggesting that very small numbers of people will be affected. But the HRA says *appreciable* numbers of people are expected to experience adverse psychological and anxiety effects from the spraying programme.

This expectation that the major effect of the spraying would be a 'mental' one, is further confirmed by the fact that the only active health study being conducted during the programme is a psychological one. The Behavioural Science Department of the University of Auckland is assessing the "psychological status of the community before, during and after the spray programme." [12]

[12] Kalemba et al. Health Risk assessment of the 2002 Aerial Spray Eradication Programme for the Painted Apple Moth in some Western Suburbs of Auckland: p49

This may also account for the number of reports received that MAF doctors have done all they could to dismiss the symptoms being presented as 'nothing to do with the spray' and it's 'all in your head'.

> *'Was given the third degree by the MAF specialist - trying to prove not been sprayed".*
>
> *Felt the MAF doctor was trying to disprove symptoms - that they were 'on MAF's side not mine'.*
>
> *"Dear god give me strength not to say this is driving me mad as this is exactly what MAF are trying to prove with us all who are reacting to this spray, as they say this is all in our heads and this spray is safe."*
>
> *"It's no use reporting to a MAF doctor because they are trained in pc and won't acknowledge there's a problem. The patient 'thinks' he/she has a problem."*
>
> *MAF doctor said that if they sprayed ice-cream, half the population would react.*

Several reports note that people presenting with severe effects who wanted to be re-located, have had to be seen by a counsellor first. Of even more concern have been reports from several different sources that MAF doctors were sending people for psychiatric assessments - 'they are trying to say it's all in the mind'. One resident very distressed and frightened after receiving a call from a doctor wanted to know who had given their details to the hospital? Was extremely worried that they would be 'taken away' if they complained any more.

There is no doubt there is a very high level of anger, distress and anxiety in the community. But it would appear that it is as much a result of the manner in which the programme is conducted as the actual spraying itself. As noted previously there are numerous complaints about the inability of authorities to conduct the campaign in a manner that allows avoidance and protection of the vulnerable.

> *Upset not informed being sprayed until it happened - not affected, but couldn't contain feeling of panic when plane 'dive bombed house several times' - very angry about the spraying - wants it stopped and other methods employed.*
>
> *Felt as if living in a war zone after the 10 hours of spraying on October 23rd. Caused great stress and fear in the community. 'Nerve wracking' noise of aircraft must be dangerous plus the 'terrifying' closeness of the planes.*
>
> *Child extremely upset by low-flying Fokker - 'planes like this fly into buildings over and over and over again'.*
>
> *Very worried about keeping family safe - kids sick. Never knew when spraying going to take place - feels hostage to the situation.*
>
> *On health register and evacuated - upset that system not working - taxi arrived as plane spraying overhead so had to remain shut in house … subsequently family all woken by tel call at 4.30am to evacuate, but house sprayed the previous day.*
>
> *"The last time I saw images of children fleeing from low flying aircraft was in the 1960s when my Year 4/standard 2 teacher brought pictures cut from the newspaper of children during the Vietnam War fleeing from military aircraft. It seems unbelievable that the same scenario is being played out in our schools. As I walked across the playground this week just as a MAF plane had flown overhead I suddenly had an insight into the heart and mind of a raped child. The feeling of utter powerlessness to protect myself, and knowing that I was being hurt by the very powers that should be protecting me".*

The evidence from the community reports received here, is that an effect recorded under this category does not make it any less of an effect or any less significant to the person experiencing it, and it should not be discounted. But how do you classify an emotion, how do you record anxiety and feelings of vulnerability? These are human experiences not statistics or numbers.

> *"As for me and my property; I feel violated, watched over, taken over, spied upon, one just waits for the next blow to come, so-to-speak. I do understand that the weather is dictating days and times of spraying, but then it takes 3 days for the spray to be done - and poor Kelston is always at the end of it. During the waiting time: we wait; cannot go shopping just in case; cannot work in the garden, just in case; keep all windows shut tight, just in case; and we wait. At times another helicopter passes over and we panic; we phone MAF; no, 'not ours' they say. We plan to leave the house for a while: WHERE TO GO?? Many old people live alone, some have no car. Where do you want them to go? And when? everyday, go 'somewhere' just in case?? I am only expressing, by 'we' the sorrow of many other people I know. Well, while I type, the 3rd spraying has started early this morning. MAF on the phone say they don't know if Kelston will be sprayed today, Waikumete Cemetery is being 'done' at the moment. Phone again, they say. Meantime I live in a tightly shut house, getting claustrophobic by the minute. The drift from the Waikumete spraying came early here. Despite everything shut, the dead smell is back. I phone a friend. 'get out', she says. OK. IF I GET OUT, and they don't spray, do I do the same again, and again, until they spray? Is this my life? I am nearly 85 years old. I would love to spend my last years as a human being, not a hunted animal".*

3.11 Social & Community Impact

This last account clearly illustrates the reality of the aerial spraying for people in the community. It is not just the actual health effects that have to be taken into account, it is the impact of the whole programme on the lives and the livelihoods of the people. In this respect this final health section is perhaps the most relevant in recognising the validity of recording these effects.

As noted in Table 1, social impacts are the third most frequently reported effect. Apart from some environmental and animal effects (Appendix A), none of the 253 incidents in this category have been experienced in isolation, all are part of the primary health effects being reported. As such, they should be considered direct consequences of the aerial spraying.

The spraying programme as detailed in the operational section 3.3 clearly illustrates the difficulties many people are having trying to maintain a normal existence while this eradication is being conducted. The prolonged nature of the programme, and the extent and duration of each spray have made life particularly difficult for those people needing to evacuate the spray zone.

Whilst dates may be set for the commencement of the next spray, the decision may not be made until 4.00am on spray day. Delays will mean that those people evacuated pre-spray may endure several days in motels waiting for the spray to start. Those evacuating on the day may need to rouse children and other family members from their beds in the early hours, to take to motels or breakfast venues. The spraying may not be completed that day

and if their area has not been sprayed, they will have to evacuate the following day as well. Weather problems may further delay the completion, bags will have to be packed and unpacked as the on/off conduct of the spraying continues.

The inability to plan, has resulted in many comments about the disruption and distress of 'living life on hold'. Vulnerable people relocated outside the area, often detail the difficulties of living out of a suitcase and the strains being placed on marriages and family life. The distress of being isolated, of missing children's birthday parties, of not even being home for Christmas. For some, who have already experienced a year of dislocation, life is simply described as a living hell they have to endure or survive.

> *Stayed with family out of zone - spray took 7 days to complete. "Each day I thought I just might be able to go home ... the disruption to my normal routine and lifestyle was huge. I dare not go home for anything I may have forgotten to bring with me in case I got sprayed."*
>
> *"We have to set the alarm for 4.00am on spray days and phone the MAF hotline to find out if spraying is on. If it is, we then have to pack up our gear as though we are going away for a week. (the spraying can take this long). We have just over an hour to do this. We have to pack clothes, toys for the children. Set up lighting, empty the fridge of perishables, wake the children up, get them ready and load up the car".*
>
> *"Trying to safeguard my children from the possibly toxic side effects from the MAF spray programme has turned into a nightmare for my family. I have taken so many days off work to take my children away from the unknown dangers of the spray and quite often it has turned out to be a hoax on account ... of the weather."*
>
> *Very upset at being trapped all day during spraying. Caring for grandchildren - not only had to keep in all day, but couldn't get them home because home area being sprayed again in early evening in spite of being done in the morning. Asks how anyone can have a half normal existence if this is what is going to happen every couple of weeks*
>
> *A resident severely affected and evacuated each spray for up to seven days, is horrified that MAF were now going to spray the cemetery near her home every week. "Does this now mean that I will be barred from my home permanently? I am so upset at reading this I have been in tears most of the afternoon as what kind of life is this? My life has been in total disruption now for the past twelve months, It is bad enough being out of pocket each and every month due to added expenses each time I get relocated, this is so unfair not only for myself but for my family as well".*

Throughout this report the illustrative stories have noted the financial consequences of the spraying programme that individuals and families are having to bear. Eighty two reports detail the financial impacts of time off work, of using up all sick leave and holidays, of loss of pay, and even loss of their job. Some of the reports record devastating expenses and loss of earnings, extending into thousands of dollars. Of unknown costs are those incurred by the 14 families that have been forced to sell their houses or move out of the area to escape the spraying.

> *Mother angry at the expense - has had to continue to pay for day-care although not attending, plus medicine and time off work to care for the child. "My little boy and my family have to suffer because of some pathetic campaign to kill caterpillars ... at our OWN expense (healthwise and moneywise!!) very unfair and stressful".*
>
> *Suffers from chronic asthma & respiratory problems. Spraying disruptive to health and working capacity - struggles on a tight budget, can't afford to miss work.*

Past toxic spray sensitivity - moved unknowingly into extended spray zone - immune system much tougher but since spray gone downhill again. Is sole support for family so has to work - but has to cover rashes and 'grit teeth' during bladder and bowel spasms so that colleagues do not suspect.

Child was an under control asthmatic – played sports. Now has really bad respiratory problems every 3 weeks. Paid $1,200 bill for private specialist. Starship can't see him. $80 every time he goes to doctor. (doesn't qualify for community card).

"If I take days off every time they spray I will use up twenty years of sick leave in the next four months (I am not being sprayed one day every three weeks ... I am being sprayed or working in the spray for three days every other week) ... I lose holiday pay as well when I take leave without pay. I only have enough money to keep myself safe for a month or so. Then I will have to consider selling my house or changing jobs".

Local businesses have also been affected. Absentee and sick employees have to be accounted for and their work covered by others. Extra precautions have to be taken to protect staff and stock, and at least one retail shop closes completely on spray day. One local business surveyed its manufacturing staff and detailed the health effects experienced after two of the aerial sprays (Appendix B). The effects reported, mirror symptoms recorded by residents, with 15% of employees noticing health effects in themselves or their family. If their experience is repeated throughout the industrial areas being sprayed, the impact will not be insignificant. Self employed residents are also hard hit, with reports of lost business, both from having to leave the area themselves or from clients unwilling to come into a spray zone.

But of huge concern is the number of reports of people being unable to afford to visit their doctor or pay for treatment and prescriptions costs. Whatever the cause of the symptoms, they are still being experienced, and whilst able to access a free 'assessment' people are still being told to return to their own doctors for treatment at their own cost.

It has been noted that many media comments and reports assume that the health monitoring and support service provided by MAF include these costs of treatment. The misconception even extends to politicians. As this report was being completed, the Assoc. Minister of Biosecurity, the Hon Marian Hobbs stated that she understood "there are doctors in the MAF Health Service [who do know the contents of the spray] … and they are able to treat people who exhibit allergic reactions."[13]

Not only is there no free treatment or prescription service for those affected by the spray, but many people report that they struggle to even get recognition they may have been affected by the spray. There are numerous reports of MAF doctors, GPs and even 0800 staff informing people their symptoms are not caused by the spray. As recorded in section 3.10, many people also believed the MAF doctors were actually doing all they could to dismiss their symptoms, and those who persisted in trying to get support and assistance were being 'put through the hoops' to get anywhere.

This may be correct in that the MAF health service providers note that their role is not to provide treatment, but *".. to establish through consultation with you, and with reference to relevant medical history what, if any, the connection is between your health concerns and the spray drop*."[14]

[13] TV3 news - 30.1.03
[14] Independent medical advisory team information sheet

A couple of reports note that specialist consultants had told patients the assessment they were doing of their condition was not to confirm the effect but to find an alternative cause. More worrying is a documented report of a specialist adjusting his diagnosis after receiving 'further information on the spray'. The new diagnosis meant the patient was not considered 'affected' by the spray and the evacuation was rescinded. (Patient's GP had the order overturned).

> *Practise nurse and lots of friends have reported blood noses - made notes of incidents but MAF say 'those symptoms are not associated with the spray'.*
>
> *Many children at child's school seem to have skin rashes and asthma - asked teacher to report it to MAF, but told no use as they (MAF) would simply class it as the 1% affected and dismiss it.*
>
> *Suffers from hay fever - severe symptoms since the spraying. Spray smell very strong - had to use puffer - symptoms never gone on that long, now April (usually finished in January). Feeling very tired even after taking vitamins. MAF doctor said not the spray - "it should not affect your health".*
>
> *Child developed 'bronchitis' after the spray, but MAF doctor said not from the spray.*
>
> *"Have been seen by MAF doctor and dismissed as not caused by spray".*
>
> *Very upset that MAF discounting family ill health (rash, diarrhoea, headaches, 'pins and needles in tongue', cramps). Feels needs to go back to Australia so can have a 'free right to health'.*
>
> *GP diagnoses ulcerated throat after spray. On reporting to 0800 line, was told that because he had been given antibiotics 'it could not possibly be related to the spray'.*
>
> *Not reported problems to any doctor ... "because I don't think they can do anything or really give a damn about it."*

It is evident by now that the aerial programme has impacted not only on the lives of those affected and their families, but the whole community as well. This is never seen more clearly than in one final area of concern raised over and over again - the impact on children and their schooling.

Anxiety about the exposure of children to the spray in schools and concern for their safety runs across the whole community. It is not necessary to review these concerns covered previously to highlight a related impact - the effect on the children's education.

As detailed throughout this report, there are a considerable number of children who have been affected by the spray. This has resulted in time off sick, and in many cases removal from school on subsequent sprays. Even when not directly affected, many children are having to leave the area with parents or other members of the family who need to relocate on spray days.

These are not single days every three weeks, but multiple days on each series of sprays. The aerial programme has been running for a year, and the disadvantage faced by every child who attends a school in the spray zone is considerable compared to other schools outside the area. Distractions in the classroom during spraying, re-scheduling of outside classes, sports days sprayed on, exams having to be taken during spraying, loss of teachers sick themselves are all detailed here - but not, it appears, taken into account or recognised anywhere else.

How do we measure the cost of this impact of the aerial eradication programme? How do we quantify the loss of schooling or marks in an exam? The failure to recognise these non-health impacts - let alone the health impacts so clearly illustrated by the community in this report - underlines the complete inadequacy of the whole risk assessment process as currently applied. If MAF can assess that it would cost 7% of New Zealand households an additional $36.50 annually in pesticide spray for their gardens if the moth became established, [15] one is led to ask why the *real* health and economic costs of the aerial spraying has been ignored?

CONCLUSION

The inadequacy of the Health Risk Assessment and its inability to accurately predict the level, extent and seriousness of the adverse affects being experienced by the community is clearly demonstrated in this report. But the report also exposes the inability of the MAF health monitoring and support programme to adequately and *actually* support many of the people affected by the aerial spray campaign.

This is clearly illustrated in the reported attitude of the medical personnel where the 'expectation' that the adverse effects of the spray will be minor and insignificant has led to the discounting and dismissal of most symptoms and effects reported. This leads to the conclusion that the medical criteria are designed to eliminate and reject - not accept and support.

It may well be that this lack of support for those experiencing adverse effects would not have been so critical if the eradication programme had been of a short, even intense nature. But the reality of a year of aerial spraying that has escalated and expanded into days of dislocation and disruption virtually every other week, is of a programme that is having to be endured without an end in sight.

But this report has also shown that when the social and economic impacts of this programme on the lives and livelihoods of the community are also taken into account, then the lack of support and even sympathy or compassion, is truly devastating for many people. In this circumstance it is not unreasonable that the question should be asked who supports and protects the people? Who is on their side? For it seems to be forgotten that this situation is not of their making. It is not their fault.

If for no other reason than the ability to illuminate this issue, then the value of this community-based health and incident monitoring has been proven. Time and resources precluded a more comprehensive analysis of the spraying impacts, but this is only an interim report.

The community-based monitoring will continue, and funding will be sought to complete a full report and analysis of the effects of the aerial spraying programme. The lack of community impact assessments for these sort of programmes must also be remedied, and it is intended to pursue and report on this aspect as well.

[15] The Ministry of Agriculture and Forestry: Painted Apple Moth: Reassessment of Potential Economic Impacts. 7 May 2002.

Appendix A

Animal & pet effects

"The spray is not harmful to any animals including cats, dogs, horses, birds or fish"
(MAF newspaper advert - health advice for residents)

The HRA does not comment on the animal effects of the spraying, and this small section would not have been included except for the above statement. As in previous programmes there appears to be no mechanism or pathway to record the sort of effects that could be considered valid when assessing the safety of the spray.

Concerns from residents recorded early in the programme about the possible effect of the spray on animals seem to have been borne out by subsequent events. Publicity after the first sprays, about a horse with a severe skin reaction that was moved out of the zone by MAF, generated a number of initial calls and reports.

The majority of effects are reported in cats and dogs. This is to be expected as pets are generally well observed and cared for. Twenty three reports are of cats affected and eleven of dogs. A common comment is "they are not themselves, these days", and repeat symptoms on subsequent sprays are often noted.

The majority of cat symptoms are vomiting or off their food for days following spraying. They also suffered sore and infected eyes, and skin 'allergies'. Lethargy, dull fur and 'generally ' unwell are also frequently noted. The major symptom for dogs appears to be diarrhoea, with eye and skin problems coming second.

Comments about wild birds 'not coming any more' are common, with reports of both wild and pet bird deaths reported shortly after spraying. A number of fish deaths in uncovered ponds have also been reported from both owners and professionals. A breeder of chinchillas notes that in the year since spraying commenced her two females have both continually aborted with only one animal surviving.

That animals have been affected by the spray would appear to be borne out by these reports. Comments from a number of owners that their vet said they believed the pet or animal's problem was spray-related, are supportive of these reports.

Appendix B

Douglas Manufacturing Ltd, Central Park Drive, Lincoln, Auckland. PO Box 45 234, Auckland 1230, New Zealand.

PAINTED APPLE MOTH ERADICATION PROGRAMME
Effects noticed by Douglas Manufacturing Staff surveyed on the 20th November 2002 and the 2nd December 2002

20th November 2002 aerial spray

106 employees available
The employees were asked:

1. If they lived in the spray area.
2. If they or their immediate family noticed any effects they attribute to the spray.
3. If they had any concerns regarding the spray programs.

1. 52% of Douglas Manufacturing Staff live in the spray zone.
   6% live in the drift zone.
   42% live outside the spray zone.

2. 15% of the employees experienced health effects or had family that suffered health effects.
   5% were unsure if the non-specific health effects were due to the spray.
   80% did not observe any health effects.

   29 health effects were reported. The types of effect suffered expressed as a percentage include:
   - 35% suffered eye problems (itchy, watery or sore eyes)
   - 38% suffered lung and/or respiratory problems. (Difficulty breathing, asthma attack, respiratory irritation, nosebleeds, sinus pain and sneezing, pre-existing allergies had worsened).
   - 7% suffered skin burning or irritation.
   - 10% developed headache.
   - 3% suffered swelling of the face and eyes.
   - 7% had to obtain medical attention and treatment.

3. 80% of staff living in the spray zone had concerns about the program.
   83% living in the drift zone had concerns about the program and
   40% who live outside the spray zone had concerns about the program.

   The main concerns were that individuals did not know what the ingredients were in the spray, and whether the product's long- term safety had been investigated. Many were concerned about the long-term health of their children.

2nd December 2002 aerial spray

111 employees available.

1. If they or their immediate family noticed any effects they attribute to the spray.

   27 health effects were reported. The types of effect suffered expressed as a percentage include:
   - 26% suffered eye problems (itchy,watery or sore eyes)
   - 37% suffered lung and/or respiratory problems. (Difficulty breathing, asthma attack, respiratory irritation, nosebleeds, sinus pain and sneezing, pre-existing allergies had worsened).
   - 15% suffered skin burning or irritation.
   - 11% developed headache.
   - 4% had to obtain medical attention and treatment.
   - 7% suffered nausea, or upset stomach.

The effects noticed follow the trend observed during other spray programs conducted over inhabited areas. Organ damage, cancer, genetic damage, or foetal damage cannot be observed or reported by the individual at this time.

Four other reports were received from associates of Douglas Manufacturing.

1. A contractor reported that during the spray program in late November 2002 he developed breathing difficulties, something he had never suffered from in the past. He consulted a doctor who failed to determine what was wrong. Treatment cleared the problem up in 7-10 days.

   They spray performed on 2/12/02, this worker was caught outside as he did not hear the plane approaching. This time, skin irritation immediately developed, he found breathing difficult, and his eyes were sore. The problems had not resolved by 4/12/02.

2. A Douglas Pharmaceuticals Ltd worker reported that his eyes became irritated, swollen and sore during each spray, even though he was able to avoid going outside while it sprayed and two hours after.

3. A Douglas Pharmaceuticals Ltd worker reported he was caught outside during the spraying. Several days later he developed an ulcer on his eye. A condition he had never suffered from before. His partner developed conjunctivitis about the same time. A condition she had never experienced previously.

4. An employee of a Te Atatu business develops severe breathing difficulties while and after spraying is performed. She has found she has to evacuate the area, and cannot attend work during these periods. She is concerned at the potential time she will have to take off work if the spray program is extended.