PARASITOLOGY

January 2017 Contents

New Zealand Society for Parasitology Newsletter

Happy New Year

My apologies to you all. Victoria's Presidents report began "Merry Christmas members" Which I have had to amend to "Happy New Year members". November & December are the two busiest months of the year for our veterinary practice so editing the newsletter has taken a back seat.
There is lots to read this month so find some spare time & a coffee or tea & settle down to read. The Editor

The delightful Queenstown Gardens hidden Among the trees across the bay from the Conference Venue showing the end of the rainbow David Heath chased for 56 years while developing the E. granulosus vaccine

Presidents Report

This is the final newsletter for 2016 and contains some important information regarding our strategy-so please read it through!
We recently had our conference in Queenstown which was attended by 72 people in total spread over 3 days, the first being the Parasite Advisory Day and the last two, conference proper. Queenstown is a wonderful place to stay for a conference at any time of the year, but the Rydges Hotel provided us with a few more challenges than normal. It was more like Fawlty Towers than a tourist destination hotel, with power cuts on day one (Which Colin McKay ably martyred through!), drilling, gluing and hammering for all three days. To those that were there, I'm sorry for the headaches that developed and these annoyances but it didn't really detract from the excellent presentations, especially I felt, those from the Universities. The bar is very high!.
As I write this, the earthquake has just struck North Canterbury and the damage around Waiau, Kaikoura and Wellington is awful to see. Our thoughts go out to all affected people who have lost homes, businesses and animals. It certainly puts in perspective how lucky the rest of us are and all New Zealanders most of the time. Sewage contamination will lead to a whole host of other calamities-parasitic included…
Conference next year is being planned for Palmerston North and we will have the dates for that by the next newsletter.

Strategy

One of the AGM items was to discuss the strategy that had been mooted by David Heath in 2015. The subcommittee of Trevor Cook, David Heath and Richard Scott came up with the initial framework, the NZSP committee then reworked it (tried to simplify as much as anything) then presented it to the AGM for further improvement. Below is the latest version. Note there are some quite audacious goals; getting parasite knowledge into schools isn't as easy a task as one might think and it also needs to be resourced. Even providing a prize at schools will be difficult (how does one judge, moderate etc?). Perhaps this can be achieved at a local level rather than nationally, but if its not in the strategy, then it wont happen at all-right?!

Strategy Separate from Tactics

The strategy is presented here as being separate from the tactics-what we will/can actually do. So concentrate on the strategy!
Any comments or improvements please email to Saleh for compiling purpose.

Saleh.Umair@agresearch.co.nz

NZSP Strategic Plan

Feedback is required on which of the following two statements best states the purpose of the NZSP.

1) To be the home of all things parasitological in NZ.

2) For the advancement of the knowledge of parasitology by encouraging the collaboration, discussion, research, and dissemination of knowledge in all facets of Parasitology pertaining to New Zealand.

The objectives of the Society shall be: *(these are the objectives in the constitution for your information, do not comment on these)*

- Promote the advancement of parasitology
- Maintain liaison with other scientific societies
- Encourage the dissemination of information and new developments in Parasitology for education and the betterment of society

Strategy: *(comment on this, if you wish)*

- Generate increased public awareness of parasites and their relevance
- Provide student grants or scholarships to help fund speakers within, to and from NZ
- Lobby Government, Universities & Industry to continue research & interest in Parasitology and to provide funding
- Promote parasitology as an aspect of science in schools etc. and become a known resource for them
- Provide platforms for dissemination of new science
- Raise the profile of the NZSP within the general scientific community and at government level
- Maintain active links with Universities, other research organisations and ASP.
- Maintain a register of parasitology research, available for other organisations
- Grow membership

Tactics: *(don't worry about this-this was so you know we have captured ideas from the AGM)*

Assign NZPS members belonging to government, scientific etc. organisations as the conduit for exchange of information, access to collegial support, access to scientific support

1) Engage social media, print media, invite media to conferences
2) Provide subsidy to students to present their research at NZSP or ASP conferences
3) Hold annual conference, newsletters; promote collaboration & response (eg to media) with the public sector/industry; Parasite Advisory Day?
4) Identify and approach key personnel in government that may be influential in affecting relevant policy.

Offer prizes annually for young person projects/ research into parasitology -Science award; aligning with tertiary, prize for parasitology, document on the website about parasites.
Awards for excellence (enemas); best speaker/ paper/excellence in comms. Develop relationship with ACVM/ag etc
Thanks for your input though I won't promise all changes and suggestions will be accepted!

I would like to thank the committee of Saleh (secretary extraordinaire), Tania (treasurer, extremely onto it) and Cathryn (VP-with lots to say) very much for all your input and help this year. Also to David Seifert from Ruapehu Vet Services for 'volunteering' to be our new Editor, to Paul Mason and Robin McAnulty for putting on a great conference this year and to Bill Pomroy, Laryssa Howe and ??? for volunteering (?) to bring us next years conference.

Have a very Merry Christmas and a happy and relaxed new year
Best wishes
Victoria Chapman
President

The re-elected Executive from left VP Cathryn Christie, President Victoria Chapman, Treasurer Tania Waghorn and Secretary Saleh Umair.
They made the excellent decision to shout pre-AGM drinks which I'm sure sped up the AGM!

New Editor

With Dallas Bishop retiring as Newsletter editor at the October 2016 AGM our president Victoria followed a long tradition know variously as the "army" volunteer or "press gang" technique and appointed me to the position. I will do my best to aspire to the high standards set by Dallas & other former editors of the Society Newsletter. For those who don't know me, with my wife Alison I have operated Ruapehu Veterinary Services for over 30 years. Our practice services around 150 mainly sheep & beef farms to the West & South of Mt Ruapehu.

Providing parasite management advice, utilising the results of the numerous faecal egg count reduction tests we carry out each season, is an important part of our work.

Around half a million sheep need a lot of sheep dogs and maintaining their health and well being is a large part of our work. We also have several dairy farm clients on the volcanic plateau surrounding Mt Ruapehu as well as a number of deer farms and horse owning clients.

On our 140 ha property we farm 300 breeding hinds finishing all progeny for venison, 250 ewes and around 30 cattle.

Any time left is spent with grandchildren, skiing and travelling overseas.

David Seifert

2016 Queenstown Conference

For those of you who for whatever reason were unable to attend you missed a really good conference. Firstly conference organisers Robin McAnulty and Paul Mason decided Queenstown was a better venue than the 2015 AGM choice of Dunedin. Not that I have anything against Dunedin but the views over the lake while dining and out walking or running around the lake are inspiring.

Parasite Advisory Days

The Tuesday before the conference proper was devoted to another Parasite Advisory Day. These have been a great innovation with from memory four PAD's having been held since the inaugural very successful Napier PAD. This featured Northland ram breeder Gordon Levet debating with Bay DeLatour the pro's & cons of breeding sheep resistant or resilient to worms (a topic addressed at this conference in Caroline Chylinski's presentation) and attracted a large group of vets from clinical practice.

This year Bill Pomroy again unveiled his electronic answering machines. Thankfully these are anonymous, so no one else knows if you have given a stupid answer! Many of Bill's scenarios were complex with often no right answers. This was especially the case with quarantine drenching, especially of dairy heifers & dairy cows and shows the need for more investigation around mitigating cattle worm resistance . Unfortunately the numbers, especially of clinical veterinarians attending the latest PAD was back on the numbers at Napier & Palmerston North & perhaps even less than those attending in Wellington in 2014. This is an issue the PAD organisers will need to address.

Hotel Construction

As Victoria has explained it was obvious as we arrived at the venue that refurbishment was being carried out. What wasn't obvious initially was that that jackhammers & power tools would be right next door to the conference room.
Fortunately the noise & associated power cuts didn't disrupt things too badly. Certainly after a second generously poured Whisky (thanks Robin) at the Society dinner the noise & associated power cuts were well and truly forgotten. By tradition the Whisky chosen is a highland single malt in this case from Balblair (established 1790) - vintage 1990.

Conference Program

The program as usual leant heavily on the work being done at AgResearch along with Massey and Dunedin Universities. While our conferences are a great opportunity for young parasitologists to present their work we are still indebted to these organisations for making their research available to us.

With nearly all science things continue to get more complex & specialised. Biology is no exception and one of the last papers showed that in some aspects biology is getting closer to chemistry. I'm sure I was not alone in just managing to follow what was being presented at the time! It was fascinating cutting edge science dealing with the molecular shapes of cellular receptors which may in the future lead to the development of new anthelmintics (if I recall correctly) and I'm sure we will hear more about it at future conferences.
Perhaps closer to commercial development is the technique of fluorescent binding to distinguish eggs of sheep gastrointestinal nematode parasites. The technique seems equally as good as PCR and visual identification & offers the hope of more rapid and cheaper diagnosis.

One of the most fascinating presentations compared development of anthelmintic susceptible & anthelmintic resistant H contortus in worm resistant and worm susceptible sheep.
The study showed resistant worms incurred fitness costs making them more susceptible to control by resistant sheep. However despite fewer eggs being produced there was higher survival by infective L3 leading to a similar worm challenge for the next sheep grazing the pasture. Resistant sheep may not therefore be a simple answer to drench resistance.

New Parasitology Society Members

Zachary Tobias
I graduated from Lewis & Clark College in Portland, Oregon, USA where I majored in biology. Upon graduation I decided to stay at my alma mater, working as a technician in Dr. Tamily Weissman-Unni's lab that studies the development and degeneration of the nervous system using genetic labeling with fluorescent proteins and in vivo imaging in larval zebrafish. It was during my three years there that I began to read and learn about parasitology in my free time. My interest to study evolutionary parasitology coupled with my desire to get into the field compelled me to apply to a master's program, and what better option than at University of Otago with Dr. Robert Poulin?!
Here I have been conducting a thesis investigating comparative population genetics between host and parasite in two host-parasite systems. I have been studying the mermithid nematode Thamamermis zealandica and New Zealand's species of horsehair worms (Nematomorpha), two phylogenetically distant taxa that have evolved similar morphologies and behaviors. My research has afforded me many opportunities to explore this beautiful country and I'm proud to say I'm hooked on parasitology. Glad to be a part of the NZSP.

Kirstie Inglis
From the UK originally, I qualified from Liverpool Vet School in 2003. After 2 years of mixed practice in North Wales I took a 6 month dairy locum at the then Rotorua Vet Club as part of an OE trip, keen to witness the might of Kiwi Dairying for myself… Like many people from overseas, I loved my initial NZ experiences and living in New Zealand, so 11

years (and a few calvings) later… I'm still here. I've been lucky enough to work in several proactive practices around both Islands, sometimes just large animal, sometimes just small animal and often a mixed workload. I've also been involved in export work of cattle, sheep, horses and alpacas with Asure Quality, and stay on the MPI Initial Investigating Vets roster for suspect FMD call outs. In June 2016 I made the change from clinical work to an industry position, working for Bayer Animal Health, as their companion animal technical vet. The role is full of new challenges and opportunities for me, and trying to get up to speed with parasitology issues is definitely one of them.

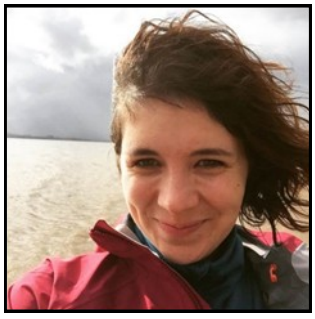
Ash Keown

Ash is a recent graduate, having completed his veterinary degree at the end of 2015. Prior to studying at Massey, Ash completed an Applied Science degree in Auckland. Born and bred in Hamilton, Ash has returned to the 'Mighty Waikato' to work as a large animal vet in Te Awamutu. Although he hasn't completely ruled out a career in drystock farming, or landscape gardening…
Ash is passionate about promoting effective management strategies which minimize pasture contamination, and reduce farmer reliance on drenching alone. Ash believes the challenges we face in the battle against parasites are only going to become more complex, and he is keen to continue to arm himself with more knowledge to work alongside farmers and the wider industry to remain on the 'front foot' in the race against parasites.

Bruce Russell

Originally from Australia, however in SE Asia for the best part of 20yrs (for the last 10 yrs resident in Singapore (A*STAR and National University of Singapore)) . Now, based in Dunedin at the University of Otago (Faculty member at the Department of Microbiology and Immunology)
I originally started out in Medical Entomology and then drifted into the field of Parasitology, with my primary focus being Malaria (esp. P.vivax), much of my work has focused on bringing the laboratory into the field (usually resource poor settings). Most of my studies have taken place with clinical partners in Bougainville (PNG), Timor, West Papua, Thai/ Myanmar border and Malaysia. While I will continue to work on Malaria, I will start to shift focus onto parasites of importance to Humans and Animals in New Zealand (i.e. Giardia and Cryptosporidium)

Olwyn Friesen



I received my BSc and MSc from University of Manitoba in Winnipeg, Manitoba, Canada. My honour's research examined how zooplankton could be used in the rapid bioassessment of lakes. My master's research focused on the relationships between the diet of canids, including wolves, arctic and red foxes, and their parasite communities. I also considered how other factors, including behaviour, life history, and intraspecific variation (e.g., age and sex), may also influence canid parasite communities. My PhD research

will focus on parasite-mediated interspecific interactions in a community of crustaceans. I am particularly interested in examining the impact and strength of parasite mediation on competition and predation.

Dr. Mushtaq Hussain Lashari

I received my early education from the well reputed educational institutions of D.G. Khan City of Punjab, Pakistan. I gained my Ph.D in Zoology from The Institute of Pure & Applied Biology, Bahauddin Zakariya University Multan, Pakistan in 2010.
My research emphasis is to enhance the ewe production through gonadotrophin supplements and parasitic abolition. I joined The Isalmia University of Bahawalpur as Assistant Professor of Zoology in the Department of Life Sciences in 2014. I won couple of research grants from Higher Education Commission of Pakistan and actively engaged in teaching and providing the supervision to MS & PHD scholars as HEC approved supervisor. I am an active member of the International Society of Zoological Sciences, and was invited as Session speaker in the 8th International Symposium of Integrative Zoology, 25-29 July, 2016, Xilinhoate, Inner Mangolia, China. I have published over 60 research papers in renowned International impact factor/abstracted journals and won research awards for the 2014-15 and also serving the scientific community by imparting services as expert reviewer of various international (IF journals) and national journals.

Parasitology in the News

From the New Zealand Herald Tuesday 8 Nov 16
http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11744312
This story features Otago University geneticist Professor Neil Gemmell. He says " "It's always a danger for us to assume that, from a biological point of view, we are the most sophisticated thing on the planet."
The link has a short video explaining how malaria parasites make mosquitoes more attracted to humans & how humans infected with malaria attract more parasites.
The story starts with:- It's the stuff of horror movies: a parasite brainwashes its victim, ultimately forcing it to kill itself, so it can reproduce. But this macabre manipulation isn't just science fiction; indeed, scientists have been aware for decades of how certain clever parasites can change the behaviour of their much larger hosts. For example rats infected with Toxoplasma gondii become less scared of cats so increasing their chance of being eaten & of the parasite completing its life cycle in the cat. There have even been suggestions Toxoplasmosis can cause humans to behave in riskier ways Gemmell said. "These parasites are highly specialised and have evolved a fascinating array of approaches to manipulate their hosts." In a new study, supported with an $830,000 Marsden Fund grant, Gemmell and his team will focus on something yet more extraordinary: the potential of DNA-based brainwashing. Two specific parasitic worms they'll investigate, found in New Zealand, are known to hijack hosts' central nervous systems, forcing them to seek water for the worm to reproduce in. Once water is found, the adult worm explodes out of the host, killing it. "There's really two different ways the parasites could do this; it either could make something that mimics or interacts with a substance in the host that's responsible for some form of neurological decision-making, or it produces something that changes the pattern of expression of the genes responsible for the production of that substance, perhaps turning them on or off. "It could even be a combination of the two and might not be a simple trigger, but one that elicits a number of different changes; this is what we hope to tease out." His Otago-based team will use cutting-edge molecular and bioinformatics tools to study two distantly related parasitic worms and their hosts - one affecting cave weta, the other affecting earwigs. They'll attempt to discover the trigger and genetic cascade through which these parasites elicit this behaviour. "This study is unique to New Zealand, and one of the things that's really cool about it is that these parasites and their hosts are relatively common."For example the earwigs, together with their mind-controlling parasites are likely well established in the roses in your back garden." Gemmell suspected that the general process was widespread among many parasite species and hosts, and that those we're aware of today could be just the tip of the

iceberg. "Host manipulation by parasites has now been documented a few hundred times spanning all major groups of animals, so probably this sort of manipulation is relatively common." Although the project will look at parasites that affect insects, the findings will be broadly relevant to many other parasite systems, including those that affect humans and livestock.

The first seconds of life, under the microscope

Another Marsden Fund study will gain new insights into the very beginnings of life.

Researchers from Auckland University and Otago University will use cutting-edge genomic techniques to study how a zygote - the cell that forms from the union of sperm and egg - activates its newly minted genome and becomes the master of its own genetic destiny.

Study co-leader Associate Professor Julia Horsfield, of Otago University, said that when a zygote forms, its genome is kept mostly inactive at first.

"However, at a defined time-point, the zygotic genome becomes active and is transcribed - its genes are switched on," she said.

"At this crucial time, the embryo becomes master of its own destiny."

Working alongside Auckland University's Dr Justin O'Sullivan, Horsfield will test the theory that a special 3D structure forms in the cell's nucleus and permits transcription to occur and triggers genome activation.

The team will use sophisticated genomics techniques that can probe nuclear structures in zebrafish embryos.

During the study, they'll observe live imaging of the embryos and individual cells as they undergo genome activation to look at visible changes in the nucleus as genes are switched on.

"As well as aiming to discover the nuclear structure that triggers genome activation, we hope to disrupt the structure to determine how important it is for gene activation," O'Sullivan said.

Establishing how the zygotic genome was at first held inactive, and how it rapidly became activated, would provide new insights into the earliest stages of life, he said.

The $810,000 in Marsden Fund grant would also enable a new collaboration with the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden, Germany.

"It will bring our farflung team together to tackle one of the biggest enigmas in biology - how an individual expresses its genetic identity for the first time," Horsfield said.

Human cholangiocarcinoma Related to Vietnam War Liver Fluke Infection

This fascinating Associated Press story was in the NZ Herald 11 Nov 2016.

Mike Baughman considered himself one of the lucky ones, returning from Vietnam without any major injuries or psychological scars. But after falling ill nearly a half-century later, he found out he did not escape the war after all.

The 64-year-old is among hundreds of veterans who have been diagnosed with a rare bile duct cancer that may be linked to their time in the service and an unexpected source: parasites in raw or poorly cooked river fish.

The worms infect an estimated 25 million people, mostly in Asia, but are less known in America. They can easily be wiped out with a few pills early on. Left untreated, a cancer known as cholangiocarcinoma can develop; often killing patients just a few months after symptoms appear.

The U.S. government acknowledges that liver flukes, endemic in the steamy jungles of Vietnam, are likely killing some former soldiers.

Ralph Erickson, who heads post-deployment health services at the Department of Veterans Affairs, said about 700 cholangiocarcinoma patients have passed through the agency's medical system in the past 15 years.

Less than half of those submitted claims for benefits, in part because they were unaware of a potential link to time in service. Of the claims submitted, 3 out of 4 have been rejected, according to data obtained by The Associated Press through the Freedom of Information Act.

The VA requires veterans to show medical conditions are at least "as likely as not" related to their time in service to receive financial help, but doctor's note that often isn't easy with bile duct cancer caused by liver flukes.

The parasites typically go undetected, sometimes living for more than 25 years without making their hosts sick. The body reacts by trying to wall off the organisms. This causes inflammation and scarring and, over time, can

lead to cancer. The first symptoms are often jaundice, itchy skin and rapid weight loss. By then, the disease is usually advanced.

If American doctors better understood bile duct cancer and the potential risks to those who served in Vietnam, they could use ultrasounds to check veterans for inflammation, and then surgery might be possible for some of them, said Jeff Bethony, a liver fluke expert at George Washington University.

"Early is key," he said, adding he regularly receives desperate letters from veterans' family members. "The VA should be testing for this."

Once diagnosed, most men don't realize there may be a connection to their service in Vietnam. The few who figure it out often spend their final months fighting for recognition and benefits, leaving them feeling angry and abandoned, as many did when they first came home from the war.

"Hard to believe," Baughman said in his living room, flipping through a photo album from his war days. "I dodged all those bullets, then get killed by a fish."

Baughman had just turned 19 when his draft number came up in late 1970. He was soon deployed to central Vietnam near Hue to do reconnaissance in the mountains. Although he was the youngest in his Army unit, he quickly became one of its most valuable members.

"The Vietnamese like to shoot the first guy in line, and last guy," Baughman said. "And so that's what I trained to do: Be the first guy in."

He would walk point clearing thick jungle with a machete and, thanks partly to growing up hunting in the hills of West Virginia, he proved gifted at noticing the smallest twig or leaf brushed out of place by the enemy. It was his job to spot booby traps and potential ambushes.

Often on long missions, sometimes forced to sleep outside with sheets of monsoon rain pelting down, his unit would run out of rations and go fishing for dinner near the border with Laos.

"We would throw a grenade in the water, and then scoop them off the river floor," Baughman said. "We called it 'fish on a stick.'"

The men would use a helmet and a tiny blue smokeless flame to cook the fish as best they could, but it never really got done.

Years later, when he returned home, those makeshift meals became just another story he would tell about roughing it in Vietnam. He went on to earn a master's degree and became a successful engineer in Silicon Valley working for Atari, Apple and others.

In October 2013, he was about to remarry and decided to get a long-overdue physical. He felt fine, but his blood work indicated there might be a problem with his liver. Further testing revealed he had bile duct cancer.

After researching the condition, Baughman discovered that worms ingested decades ago in that raw "fish on a stick" could be killing him. He turned to the VA for help, and his private physician wrote a letter highlighting the potential connection between the worms and the disease. He went to a VA doctor as well, who also acknowledged liver flukes were one of the main risk factors for the cancer but concluded there was "no evidence of infection" from Baughman's service time.

He was twice denied benefits in 2015, and is waiting for the results of his latest appeal.

Liver flukes are found mainly in parts of Southeast Asia, China and South Korea, where residents and tourists alike risk infection from specific types of freshwater fish such as tilapia and carp.

In one location in Laos, researchers found liver flukes "which can survive pickling and fermentation " in about 60 percent of villagers, and in some parts of Vietnam, up to 40 percent were infected. Experts say it's hard to know how many people in the region may be dying from cholangiocarcinoma caused by the parasites because there are few cancer registries.

In northeastern Thailand, where many villagers have a taste for the sour fish dish pla som, new bile duct cancers affect about 84 in 100,000 people, the world's highest recorded rate. Little research has been conducted outside of Thailand, where mobile clinics routinely perform bile duct ultrasound screenings in hard-hit areas.

Once cancer is detected, surgery is sometimes an option, depending on the tumor's location. Liver transplants typically aren't performed due to organ shortages and poor prognosis.

In the United States, cholangiocarcinoma is extremely rare, with roughly 5,000 people diagnosed each year, including some Asian immigrants who ate infected fish in their native countries. Liver flukes aren't the only risk factor for the disease; others include hepatitis B and C, cirrhosis and bile duct stones.

But some physicians say for Vietnam veterans diagnosed decades after U.S.-backed Saigon fell to communist forces in 1975, the cancer is "as likely as not" tied to their service time. And by VA standards, that should be enough to receive benefits.

Asked if it was likely men were infected on the battlefield, Dr. Banchob Sripa, a leading expert on the disease at Khon Kaen University in Thailand, said "it is the only way to explain it." He said doctors in the U.S. and Australia, which also sent troops to the war, have contacted him for help in determining whether the parasites are to blame for veterans' cancer.

More than 100 appeals for cholangiocarcinoma dating back to the early 1990s are on the VA's website. Though Erickson said there have been no significant case increases among veterans in recent years, data collected following an AP inquiry showed the number of benefit claims has increased sixfold since 2003.

Claims hit a high of 60 last year, with nearly 80 percent denied. Decisions appear to be haphazard. Some are approved automatically. Others, presented with the same evidence, are denied. For instance, some rejections were based on the fact that parasites were not found in stool samples, but those tests were conducted years after the worms would have died. Other claims were dismissed because the veteran did not report his illness within a year of leaving Vietnam, yet symptoms typically don't appear until decades later.

VA officials say while they're sympathetic, it's up to the men to prove that liver flukes from Vietnam are killing them. They say because the cancer remains rare, it would be unrealistic and onerous to carry out regular screenings.

"This is still a legal process that both the VA and the veteran have to go through, and we will look at each case and all the evidence that is presented to us and make a determination at that point," said Steve Westerfeld, a spokesman for the VA's Veterans Benefits Administration. "Certainly any veteran has an opportunity to appeal."

Many do, sometimes two or three times before either getting approved or giving up.

"It's discouraging to fight for something that you think should probably be available for people who actually went over and served," Mike Brown of Valencia, California, told the AP earlier this year after learning he had bile duct cancer. He died last month at age 68, just days after finding out the VA had approved his claim.

Often, it's the widows who are left fighting.

"It's bad enough," said Anne Petitti, whose husband, Mario, died from the disease in 2010, just a few months after being diagnosed. "They shouldn't be put through the wringer or have to go through all the red tape."

She eventually won her fight with the VA, and set up a Facebook page to help other veterans navigate the system while also cataloging new cases.

How much veterans, or their families, are compensated depends on many factors, including to what degree the illness is affecting their ability to have productive lives. An unmarried veteran can get nearly $3,000 a month, but some spouses said they get about half that amount.

For many, it's not about the money. It's about raising awareness, both among veterans and the VA, and receiving recognition for their service.

"Most vets understand very quickly it's a terminal disease and that they don't have much time," Petitti said.

Baughman talks about his own future with caution, even though he's already beaten the odds: He was supposed to have died last November. The illness forced him to stop working, and his medical bills have skyrocketed from all the tests, radiation and chemotherapy. He's luckier than some because he has good insurance.

He's not in touch with most of the guys from his old unit, but he worries about them too. Unlike today's troops, those who served in Vietnam were shunned when they came home. It's one more reason having this medical condition recognized by the VA matters so much to him.

"It'd be nice to have me win my little battle," he said. "But ... I want the government to do it for everybody."

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Associated Press writer Tran Van Minh contributed to this report from Hanoi, Vietnam.