

## **It is Not Your Fault**

### **Infertility, Miscarriage, Birth Defects, and Perinatal Mortality in the Progeny of New Zealand Vietnam War Veterans**

I welcome critique and disputation about the contents, the facts, opinions and conclusions, of this research paper. That's how research is tested and verified, or not. But before you do engage please read it first, carefully, and all of it.

There are a thousand and one biologically plausible causes of the disease, disorder, disability, defects and deaths suffered by Vietnam veterans, their children and grandchildren. And many causes are still unknown to medical science. It is biologically impossible that Agent Orange caused it all. And it is probable that Agent Orange caused none of it.

In this paper I will examine how and why that is so in relation to the children and grandchildren.

In the previous paper in this series I showed that if you believe that you were exposed to the dioxin in Agent Orange, you weren't. Read it.

In this paper I conclude:

- That if you believe that you were exposed and that Agent Orange caused the birth defects in your children and grandchildren, you weren't and it didn't; and
- The birth defects are not your fault.

### **Pouri te Ngakau (Sad is the Heart)**

It is immensely sad that many of the children and grandchildren in our community are afflicted with various conditions. Some of their stories are truly heartbreaking. Understandably many Vietnam veterans who have children and grandchildren with those birth defects and disabilities have assumed them to be the result of war service in Vietnam. You are wrong.

You have wrongly adopted the Agent Orange narrative as your own. You have adopted its assertion that Vietnam veterans were exposed to the dioxin contaminant in Agent Orange in sufficient dose (dose-response) over sufficient time (time-exposure) to cause a wide range of disease, disorder, disability, defect and death in veterans and their progeny.

There is no evidence that that was the case. In fact, all of the available evidence shows that the incidence of disease, disorder, disability, defect and death in Vietnam veterans, their children and grandchildren, is the same as the incidence in the general population.

Many suffer from the guilt of believing that they were the cause of the diseases, disorders, defects, disabilities and deaths of their children and grandchildren. They should be in no doubt that they are not guilty.

Some veterans and children of veterans have decided not to procreate for fear of birthing children with disease, disorder, disability and defect, possibly leading to untimely death. That fear is totally unfounded.

That unfounded guilt and fear is the true legacy of Vietnam, not the disease, disorder, disability, defect and death wrongly attributed to Vietnam. I call it *Mamae: The True Legacy of Vietnam*. It is an unnecessary *Mamae* (in this context *hurt, suffering, anxiety, fear, guilt*).

Because it is not your fault.

### **Why Not?**

The Agent Orange narrative began in the USA in the late 1970s and was brought to Australia and New Zealand in the early 1980s. In this part of the world the two leading claim makers and proponents of the Agent Orange narrative were Vietnam Veterans Association of Australia (VVAA) and Vietnam Veterans Association of New Zealand (VVANZ).

Although based entirely in false premises, it quickly took hold in all three countries. It became the orthodox narrative or belief, and it has persisted to the present day. The Agent Orange claim makers went to great lengths to discredit and debunk any evidence contradicting the Agent Orange claims. They relied on contested science and on unreliable and uninformed journalism to promote the claims.

From the early 1980s credit for maintaining the Agent Orange campaign is rightly attributed to Vic Johnson and John Moller of VVANZ, with help from the late Geoff Braybrooke MP. Occasionally credit is also given to a small group of claim makers who were advocating on behalf of their children. They were Evan McKenzie, John Jennings, Gavin Nicol, Elizabeth Lancaster and others.

A book by Deborah Challinor & Elizabeth Lancaster<sup>1</sup> records the belief of five families that their progeny have been adversely affected by paternal chemical exposure in Vietnam. They are the Nicol, Henson, Jennings, Murphy and Lancaster families. The book is often cited as evidence of exposure affecting children. It is probably the most frequently cited as evidence. However the main author clearly states that it is not evidence. In her introduction Challinor writes:

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<sup>1</sup> Challinor, D., & Lancaster, E., *Who'll Stop the Rain? Agent Orange and the Children of New Zealand's Vietnam Veterans*, Harper Collins, Auckland, 2000.

*“This book does not set out to prove that exposure to chemicals in Vietnam has been the cause of the health problems of some of New Zealand’s Vietnam veterans, or those of their children. It seems that science itself cannot do that yet. What the book is intended to do is tell the stories of five New Zealand families who are living daily with ill health that they believe has resulted from service in Vietnam”.*<sup>2</sup>

The following analysis disputes the claim of causation due to Agent Orange exposure. It is impossible to do so without alienating and angering some of the children (now adult children) and their parents. Perhaps though, this analysis might lead to greater understanding, and to more relevant and broad ranging questions about causation, rather than to a single biologically impossible answer; i.e. Agent Orange (actually the minute dioxin contaminant in Agent Orange).

For it is not your fault. Birth defects are a lot more common than you think, with multiple causes both known and unknown.

### **What are Birth Defects?**

In the Vietnam veteran community and in general the science of birth defects is little understood and widely confused.

*“Birth defects continue to be a leading cause of morbidity and mortality worldwide. A birth defect is an abnormality of structure, function, or body metabolism that is present at birth and results in physical or mental disability, or is fatal. The prevalence of birth defects is about 3% of births. The etiology of birth defects or congenital malformations is estimated to be genetic in 15-25%, and environmental in 10%. In 65-75% the etiology remains largely unknown and is thought to be polygenic, multifactorial, spontaneous errors of development, or synergistic interaction of teratogens. Less than 1% of all malformations due to environmental etiology are related to exposures to drugs, chemicals and radiation. Because the etiology of spontaneous malformations is largely unknown, there is considerable debate and concern over the contribution of unidentified environmental agents to this group.”*<sup>3</sup>

Birth defects are common, and the causes mostly unknown, but including spontaneous errors of development without external cause.

In New Zealand most of the heat in the Agent Orange discourse now concerns the children and grandchildren of Vietnam veterans, for the science about the health effects on the next generations has not so far been stretched across the presumptive bridge by political decree, except for just a few presumptive conditions, declared presumptive in the absence of

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<sup>2</sup> Ibid, pp 8-9.

<sup>3</sup> Shenoy, R. & Kamath, N., Teratogenicity of Environmental Pollutants: An Overview, Chapter V in Engels, J.V., Focus on Birth Defects Research, Nova Science Publishers, New York, 2006, p 106.

proof.<sup>4</sup> It is currently (2015-2018) being played out at the Waitangi Tribunal.

### **A Claim to the Waitangi Tribunal**

The WAI 1401 claim<sup>5</sup> can be considered representative of the many claims, formal and informal, that toxic chemicals have had, and continue to have, adverse trans-generational effects in the whanau of Vietnam veterans.

It is contained within:

*“The claim of Te Whakahuihui Vercoe (deceased), and John Bluett for themselves, and on behalf of Maori Vietnam Veteran ex-defence personnel and their suffering due to, inter alia, Agent Orange chemical exposure while posted overseas on active service in the years 1966-1972; and the consequent damage said chemical exposure has caused, is causing and will continue to cause said Maori ex-service men, women, their whanau, and their whanau to come”.*

That broad ranging claim invites an examination of the science and statistics of infertility, miscarriage, birth defects, and perinatal mortality.

### **Pollutants, Teratogenicity and Birth Defects**

A teratogen is an agent or factor that has an adverse effect on the embryo or foetus between fertilisation and birth.

Whether or not an environmental agent is a teratogen is determined by an analysis of whether it is likely to have the ability to produce malformation in an exposed human population, and whether it is likely to be the cause of malformation in a single patient. Not all pollutants are teratogens, and conversely it is impossible to prove the safety of pollutants in all circumstances. Additionally human exposure is usually to multiple agents rather than to a single pollutant.

Teratogens affecting the foetus and leading to birth defects include:

- Some chemicals and medications including warfarin and diazepam.
- Drugs such as alcohol, tobacco, marijuana, amphetamines, opioids and cocaine.
- Mercury, lead, PCBs, X-rays, radiation and chemotherapy.
- Infections (see CHEAP TORCHES below).

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<sup>4</sup> Veteran Affairs New Zealand (VANZ), <https://www.veteransaffairs.mil.nz/support/specific-deployments/vietnam/#EGP>. The five conditions presumptively accepted by VANZ in the absence of scientific and medical proof. “Natural-born children of Viet Nam veterans may qualify for an ex-gratia payment of \$30,000, if diagnosed with one of adrenal gland cancer, acute myeloid leukaemia, spina bifida, cleft palate, cleft lip. If the child passed away from the condition, immediate family may be able to claim an ex-gratia Payment of \$30,000”.

<sup>5</sup> Harman, P., Wai 2500, #3.3.20, Synopsis of Opening Submissions of WAI1401/2381 Claimants dated 4 April 2016. Accessed at: [https://forms.justice.govt.nz/search/Documents/WT/wt\\_DOC\\_103817860/Wai%202500%2C%203.3.020.pdf](https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_103817860/Wai%202500%2C%203.3.020.pdf)

- Maternal conditions including asthma, cancer, diabetes, anorexia, bulimia, epilepsy and heart disease.<sup>6</sup>

*“CHEAP TORCHES” is an acronym for a special group of infections that can affect the developing baby during pregnancy. CHEAP TORCHES stands for the following:*

*C: Chickenpox and shingles*

*H: Hepatitis B, C, D, E*

*E: Enteroviruses, a group of viruses including poliovirus*

*A: AIDS*

*P: Parvovirus B19, also known as fifth disease*

*T: Toxoplasmosis*

*O: Other infections such as group B streptococcus, listeria, candida*

*R: Rubella*

*C: Cytomegalovirus*

*H: Herpes simplex virus*

*E: Everything else sexually transmitted such as gonorrhoea and chlamydia*

*S: Syphilis*

*Hepatitis B, herpes simplex virus, and syphilis are sexually transmitted diseases. The chickenpox virus is a risk to women who have not already had chickenpox, or who have not been properly vaccinated against that disease.*

*CHEAP TORCHES infections are a common cause of birth defects such as mental retardation, learning problems, jaundice, anemia, low birth weight, vision problems, deafness, heart defects, and skin rash. CHEAP TORCHES infections may also cause stillbirth. Babies are most severely affected by CHEAP TORCHES infections during the first trimester of pregnancy, when the major organs and structures are developing.”<sup>7</sup>*

Veterans and their families frequently search family history for the possibility of inherited genetic causation, and in the absence of family history then blame Agent Orange. However as shown above a wide range of other teratogens (and also spontaneous errors of development) can cause birth defects.

The determining principles of a cause and effect relationship between environmental exposures and birth defects are: <sup>8</sup>

- An assessment of the strength of the exposure.

<sup>6</sup> Caccia, N., Windrim, R., Maternal Conditions and Pregnancy, Sick kids at Aboutkidshealth.ca. Accessed at: <http://www.aboutkidshealth.ca/en/resourcecentres/PregnancyBabies/Pregnancy/MaternalConditionsPregnancy/Pages/default.aspx>

<sup>7</sup> Caccia, N., Windrim, R., James, A., Causes of Birth Defects: Teratogens, Sick Kids at Aboutkidshealth.ca, Accessed at: <http://www.aboutkidshealth.ca/En/ResourceCentres/PregnancyBabies/Pregnancy/ProblemswiththeBaby/Pages/Causes-of-Birth-Defects-Teratogens.aspx>

<sup>8</sup> Shenoy & Kamath, p 107.

- Evidence of biologic plausibility.
- Consistency of the findings.
- Specificity of the association.
- Evidence of both time-exposure and dose-response relationship.

This process requires not just evidence of exposure of either the father or mother (before conception), or exposure of the mother alone (after conception). It also requires evidence of exposure across sufficient time, and with sufficient dosage, to plausibly create a cause and effect relationship. It is a high evidential hurdle compared to the numerous anecdotal narratives of Vietnam veteran claim makers.

A feature of the Agent Orange birth defect claim is that the research cited by Vietnam veterans invariably does not consider the possibility of maternal rather than paternal exposure to teratogens. And none of those anecdotally claiming Agent Orange related birth defects seem to have considered the possibility of maternal rather than paternal exposure. Even so, the research in relation to Agent Orange has not yet established a cause and effect relationship of any type, or even in 2014, a statistical association.<sup>9</sup>

The diagnosis of the source of an exposure resulting in a birth defect would of course need to consider possible or probable exposures occasioned by both the mother and father. However exposure before conception (mother or father) is much less common than exposure after conception (mother only), and the mechanisms of exposure before conception are much less understood than those relating to exposure after conception.

*“Mutations induced from preconception exposures of environmental mutagens are difficult end points to document.”<sup>10</sup>*

Nevertheless there is ongoing genetic and epigenetic research to study the origins of paternal effects although much of the evidence remains speculative, and the interplay of maternal and paternal factors is yet to be fully researched.<sup>11</sup>

**Whether maternal or paternal exposure (or both) is involved one of the principles of the science of teratogenicity that is particularly relevant in the case of the claim to the Waitangi Tribunal is that even the most potent teratogenic agent (such as TCDD/dioxin) cannot produce every malformation.<sup>12</sup>**

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<sup>9</sup> NAS 2014, Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides (Tenth Biennial Update); Board on the Health of Select Populations; Institute of Medicine; National Academies of Sciences, Engineering, and Medicine, Veterans and Agent Orange: Update 2014.

<sup>10</sup> Shenoy & Kamath, p 108.

<sup>11</sup> Curley, J., Mashoodh, R., Champagne, F., Epigenetics and the Origins of Paternal Effects, Horm Behav. 2011 March ; 59(3): 306–314. doi:10.1016/j.yhbeh.2010.06.018.

<sup>12</sup> Shenoy & Kamath, p 108.

It is biologically impossible for Agent Orange/dioxin to be the cause of every defect.

### **Dioxins, including TCDD**

In their overview of the teratogenicity of environmental pollutants Shenoy & Kamath include a summary of the current (2006) evidence on dioxins and birth defects.<sup>13</sup> They include Agent Orange and Vietnam veteran exposure.

They conclude that paternal occupational exposure to TCDD has not been shown to have an adverse pregnancy outcome. The fathers and grandfathers are not guilty.

They conclude also that, *“there are few environmental pollutants for which we can draw strong inferences about their teratogenic potential.”*<sup>14</sup>

The current state of the science would therefore indicate that the matter of trans-generational adverse effects caused by paternal or pre-conceptual exposure to Agent Orange is at best nowhere near as settled and as certain as claimed. There is no proof.

### **US and Australian Evidence**

The 2006 overview and conclusions by Shenoy & Kamath are supported by 2014 US and Australian evidence, in relation to Vietnam veterans.

While the claimants and witnesses supporting the claim to the Waitangi Tribunal quote some evidence in support, and produce a body of anecdotal testimony, there have been US and Australian studies specifically related to Vietnam veterans and Agent Orange that refute the claim. Some are quite recent studies.

#### **2014 - “Veterans and Agent Orange”, Institute of Medicine, National Academy of Sciences**

An initial report and ten updates have been produced since 1994 for the US Department of Veterans Affairs as the basis of conditions declared presumptive. The latest and last is the 2014 Update.<sup>15</sup> It is a meta-analysis of all the available and relevant research.

For a number of years the only birth defect considered to have a statistical association was spina bifida. In 2014 in relation to birth defects the Update states:

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<sup>13</sup> Shenoy & Kamath, pp 120-121.

<sup>14</sup> Shenoy & Kamath, p 125.

<sup>15</sup> National Academies of Sciences, Engineering, and Medicine. 2016. *Veterans and Agent Orange: Update 2014*. [NAS 2014] Washington, DC: The National Academies Press. doi: 10.17226/21845. Accessed at: <https://www.nap.edu/catalog/21845/veterans-and-agent-orange-update-2014>

*“The specific birth defect spina bifida was moved from the “limited or suggestive” category back into the “inadequate or insufficient” [evidence of an association] category with all other birth defects”.*<sup>16</sup>

That is a clear indication that the twenty-year meta-analysis found no evidence to support claims of adverse trans-generational effects in the progeny of Vietnam veterans resulting from exposure to Agent Orange and other substances.

In 1996 Michael Gough<sup>17</sup> testified at the US Senate Committee on Veterans Affairs, disputing the NAS 1996 conclusion of a “limited/suggestive evidence for an association between exposure to herbicides used in Vietnam and spina bifida in offspring”. Gough concluded that:

*“No biological mechanism is known that would explain how dioxin exposure of men could cause birth defects in their children; a well done animal experiment demonstrated that exposing male mice to herbicides did not increase birth defects among their offspring; none of the other experiments that IOM cites as supporting its conclusions about a “limited/suggestive” association between dioxin and spina bifida has any verifiable information about exposure and there is no evidence that men classified on the basis of records as likely exposed were actually exposed, the Ranch Hand study is best interpreted as showing no connection between paternal dioxin exposure and birth defects, and the absence of spina bifida from the Seveso population with higher exposures and many more births than in the Ranch Hand study directly contradicts IOM’s conclusion. The IOM committee misled itself by deciding to use the criterion that one good positive study would provide sufficient evidence for a limited/suggestive association. That decision when combined with picking through the available data and selecting one finding that supports their conclusion is not scientific. It led IOM to a decision that has no support”.*<sup>18</sup>

The decision of the IOM/NAS Committee in 2014 to move spina bifida back into the category with all other birth defects, “inadequate/insufficient evidence to determine whether an association exists”, vindicates Gough’s 1996 testimony although at the time it was

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<sup>16</sup> NAS 2014, pp 7-10.

<sup>17</sup> Dr. Gough is a biologist and was in the 1980s the Director of Special Projects in the Division of Health and Life Sciences of the Office of Technology Assessment, United States Congress, where he was responsible for much of the Agent Orange research. He chaired the U.S. Department of Health and Human Services committee that advised the U.S. Air Force on its study of the health effects of Agent Orange (RANCH HAND). He is a fellow of the Society for Risk Analysis, and vice-president of the International Society of Regulatory Toxicology and Pharmacology.

<sup>18</sup> Gough, M., Testimony, Herbicide Exposure: Link to Disease, Committee on Veterans’ Affairs United States Senate, 1996. Accessed at: <https://www.cato.org/publications/congressional-testimony/herbicide-exposure-link-disease>

disputed and he was the subject of attacks on his credibility and reputation by claim makers.

*2014 - Australian Vietnam Veterans Family Study*

The Vietnam Veterans Family Study<sup>19</sup> was commissioned to determine the effect, if any, that active\_Vietnam service had on the\_physical, mental and social\_wellbeing of the sons and\_daughters of Australian\_Vietnam veterans. There were over 27,000 study participants including veterans, partners and\_their children.

The extensive report, covering the conclusions of multiple researchers, was presented in nine volumes and parts:

- 1) A Factsheet
- 2) Volume 1 - Introduction and Summary <sup>20</sup>
- 3) Volume 2 - A Study of Health and Social Issues in Vietnam Veteran Sons and Daughters <sup>21</sup>
- 4) Volume 3, Part 1 - A Study of Mortality Patterns of Vietnam Veteran Families <sup>22</sup>
- 5) Volume 3, Part 2 - A Study of Mortality Patterns of Vietnam Veteran Families <sup>23</sup>
- 6) Volume 4, Part 1 - A Study of Mortality Patterns of Vietnam Veteran Families <sup>24</sup>
- 7) Volume 4, Part 2 - Re-analysis of the Sons and Daughters Project <sup>25</sup>
- 8) Volume 4, Part 3 - The Lived Experiences of Sons and Daughters of Vietnam Veterans and Vietnam-era Servicemen <sup>26</sup>
- 9) Volume 4, Part 4 - Intergenerational Effects of Service in the Vietnam War: the stories of six families <sup>27</sup>

<sup>19</sup> Accessed at: <https://www.dva.gov.au/health-and-wellbeing/research-and-development/health-studies/vietnam-veterans-family-study>

<sup>20</sup> Commonwealth of Australia 2014, Vietnam Veterans Health Study. Volume 1, Introduction and Summary of the Studies of Vietnam Veterans Families, Department of Veterans' Affairs, Canberra.

<sup>21</sup> Forrest W, Edwards B & Daraganova G 2014, Vietnam Veterans Health Study. Volume 2, A Study of Health and Social Issues in Vietnam Veteran Sons and Daughters, Australian Institute of Family Studies, Melbourne.

<sup>22</sup> Commonwealth of Australia 2014, Vietnam Veterans Health Study. Volume 3, Part One, A Study of Mortality Patterns of Vietnam Veteran Families, Canberra.

<sup>23</sup> Forrest W, Edwards B & Daraganova G 2014, Vietnam Veterans Health Study. Volume 3, Part Two, A Study of Mortality Patterns of Vietnam Veteran Families, Australian Institute of Family Studies, Melbourne.

<sup>24</sup> Cretchley J, Laffan W, Ross A & Treloar S 2014, Vietnam Veterans Health Study. Volume 4, Part One, A Study of Mortality Patterns of Vietnam Veteran Families, The University of Queensland, Brisbane.

<sup>25</sup> Enhance Management 2014, Vietnam Veterans Health Study. Volume 4, Part Two, Re-analysis of the Sons and Daughters Project, Brisbane.

<sup>26</sup> The Open Mind Research Group 2014, Vietnam Veterans Health Study. Volume 4, Part Three, The Lived Experiences of Sons and Daughters of Vietnam Veterans and Vietnam-era Servicemen, Melbourne.

<sup>27</sup> Healy M & Reed C 2014, Vietnam Veterans Health Study. Volume 4, Part Four, Intergenerational Effects of Service in the Vietnam War: the stories of six families, TNS Social Research, Sydney.

In relation to pregnancy and birth defects it states:

*“We tested for differences in problems conceiving a baby, miscarriage, having a child who was stillborn, having a child with spina bifida, and having a child with a cleft lip and/or palate. There were no statistically significant differences in terms of pregnancy and birth defects when the rates for sons and daughters of Vietnam veterans were compared to those for sons and daughters of Vietnam era personnel.”*

The study did not appear to test for the full range of birth defects but it did focus on the birth defects most commonly attributed to service in Vietnam. It found in the Australian Vietnam veteran community no increase in incidence above those who did not serve in Vietnam.

### 2001 - The McLeod Report

Despite the 2001 McLeod Report<sup>28</sup> having being discredited by the New Zealand Parliamentary Health Committee<sup>29</sup> in 2004, disowned by the Government in 2006 and 2008, and widely and vehemently criticised within the Vietnam veterans' community, it came to conclusions similar to those of the 2014 studies.

The McLeod conclusions were based on the US and Australian evidence available at that time (2001).

Its conclusions included:

*“The primary concern relates to the contamination of Agent Orange by trace amounts of the dioxin tetrachlorodibenzo-p-dioxin (TCDD). Over the decades since the Vietnam War there has been accumulating evidence that TCDD is a highly toxic substance and a potent carcinogenic.*

*“The birth of children with a range of defects is unfortunately not uncommon and 2-3% of Vietnam veterans would be expected to have a child with a birth defect. It is understandable that veterans would question whether their exposure to Agent Orange contributed to their child's birth defect.*

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<sup>28</sup> McLeod, D., et al, *“The Health Needs of the Children of Operation Grapple and Vietnam Veterans”* (McLeod Report). A Critical Appraisal Undertaken for Veterans' Affairs New Zealand Defence Force, August 2001, Deborah McLeod, PhD, DPH, Donna Cormack, MA, General Practice Department, Wellington School of Medicine and Health Sciences, University of Otago, Tai Kake, BSc (Hons 1), Cochrane Fellow 2000 Research Consultant. Accessed at: <https://www.veteransaffairs.mil.nz/assets/Veterans-Affairs-site-assets/Research/21.pdf>

<sup>29</sup> Chadwick, S., (Chairperson), Report of the Health Committee Forty-seventh Parliament, Inquiry into the exposure of New Zealand defence personnel to Agent Orange and other defoliant chemicals during the Vietnam War and any health effects of that exposure, and transcripts of evidence, October 2004

*“As a result of veterans’ concerns a number of epidemiological studies have been undertaken comparing the health of veterans’ children with a comparison group. There have been three high quality cohort studies and a number of good case control studies undertaken both in the United States and Australia. These studies have considered the potential effects of exposure to Agent Orange on all birth defects combined, on specific birth defects and on adverse reproductive outcomes such as still birth and spontaneous abortion.*

*“The risk estimates calculated for the category ‘all birth defects’ are remarkably consistent and overall show no increased risk for Vietnam veterans for fathering children when all birth defects are considered. High quality epidemiological studies have shown no consistent positive association between exposure to Agent Orange or a range of chemicals or pesticides and any specific birth defect. However, there has been a tendency towards a slight but not significant association between paternal exposure to dioxins, pesticides and herbicides and an increased risk of the birth defect spina bifida. It is this association which has resulted in the United States Committee to Review the Health Effects of Agent Orange concluding that there is limited suggestive evidence of an association between spina bifida and Agent Orange exposure.*

[Note that in its 2014 Update the Committee has removed spina bifida from that category].

*“Similarly there has been a slight increased risk of childhood acute myelogenous leukaemia (AML) after paternal exposure to service in South East Asia and after exposure to pesticides. AML has also been accepted by the Committee as a condition for which there is limited suggestive evidence of an association between paternal exposure and adverse outcomes. There is no evidence available to permit interpretation of international evidence for an increased risk of AML in a New Zealand context”.*

That assessment holds true to this day, confirmed by the 2014 research, despite the widespread condemnation of the McLeod Report.

#### 2004 – Health Select Committee

Interestingly, even though the Health Select Committee went to considerable lengths to discredit the McLeod Report and its authors, in a single paragraph in its report the committee actually endorsed the main McLeod Report conclusion about the trans-generational effects of Agent Orange:

*“Our [scientific] adviser notes that the continuing focus on attempting to establish a relationship between exposure to herbicides, service in*

*Vietnam, and health outcomes in children is almost certainly doomed to failure, since some of the variables involved are not quantifiable today”.*<sup>30</sup>

The report of the Health Select Committee has nevertheless been widely cited in support of claims of exposure to a toxic environment leading to adverse trans-generational effects.

2017 - King & Chou

In 2017 Jesse King & Cecilia Chou of Arizona State University published an update of a 2012 online article<sup>31</sup> which provides an excellent overview of the research and science relating to birth defects in the progeny of Vietnam veterans. It is recommended reading.

*“Although Aschengrau and Monson found that overall Vietnam veterans were at slightly higher risk of fathering infants with certain congenital malformations, they noted two limitations to their findings. First, the authors considered the sample group of subjects to be too small, especially when comparing specific birth defects. Second, they noted that the congenital anomalies could also be related to maternal behaviors during the pregnancy and complications during delivery, not just paternal exposure to Agent Orange. Like the CDC researchers, Aschengrau and Monson recommended larger studies to clarify whether or not Vietnam veterans or Agent Orange-exposed Vietnam veterans were at increased risk of adverse pregnancy outcomes like birth defects and stillbirths.*

*“Several factors affected the [NAS] committee's conclusion not to acknowledge a link between Agent Orange exposure and birth defects besides spina bifida. For example, maternal exposure to chemicals as well as substances like tobacco and alcohol greatly affect prenatal development. However, such exposure was not evaluated in the studies. In the Vietnam veterans' health studies, the researchers focused primarily on the health outcomes of the male veterans. And while epidemiologic studies and historical events showed the link between maternal behaviors, maternal exposures, and birth defects, the CDC researchers acknowledged that the paternal association to birth defects was less understood. Additionally, they noted that the results likely were biased due to the difficulty of measuring dioxin exposure and to the reliance on veterans' or citizens' self-reported exposure. Finally, because certain commercial herbicides contained dioxins and dioxins persist in the soil and the environment, researchers struggled to estimate dioxin exposure levels and to identify the source of that dioxin exposure.*

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<sup>30</sup> Chadwick, S., Health Select Committee Report, p 22.

<sup>31</sup> King, J., and Chou, C., Agent Orange Birth Defects, Arizona State University. School of Life Sciences. Center for Biology and Society. Embryo Project Encyclopedia, 7 May 2017. Accessed at: <https://embryo.asu.edu/pages/agent-orange-birth-defects>

*For those reasons, the Institute of Medicine [NAS] committee added only spina bifida to the list of service-connected diseases that received compensation from the Department of Veterans Affairs.”*

The above article examines in depth the research and the reasoning behind NAS reporting and USVA policy in relation to birth defects in the progeny of Vietnam veterans. It also reports on the evidence of Agent Orange defects in the Vietnamese population. It is recommended reading.<sup>32</sup>

### **New Zealand Specific Evidence**

In order to substantiate claims of infertility, miscarriage, birth defects and perinatal deaths in the whanau of New Zealand war veterans, elevated above the statistical incidence in the general New Zealand population, and in the Maori population, there would need to be evidence of the actual numbers and percentages in the whanau of all veterans, rather than self-reported incidence by some veterans.<sup>33</sup>

There will also need to be evidence that the numbers, as a percentage of the total pregnancies and births of children and grandchildren of veterans, exceeds the percentage that would normally be expected in the total New Zealand population, and in the case of Maori veterans, in the total Maori population.

### **Incidence of Birth Defects in the General NZ Population and in the Maori Population**

Some veterans for instance cite incidences of club foot in their progeny. There is however an historical record of the elevated prevalence of congenital birth defects including club foot and cleft lip and/or cleft palate in Maori and Pacific populations<sup>34</sup>. It was noted by Philip Houghton in 1996<sup>35</sup>, and was the subject of a research paper in 2000<sup>36</sup>.

There are many papers and reports that record the incidence of birth defects and infant mortality in New Zealand, including birth defects in Maori. They include:

- Borman, Veale and Findlay, Patient Management August 1987, [\*“Major Birth Defects in New Zealand Prevalence and Patterns”\*](#).
- NZ Ministry of Health, [\*“Children with Disabilities”\*](#).

<sup>32</sup> <https://embryo.asu.edu/pages/agent-orange-birth-defects>

<sup>33</sup> Self-reporting is often affected by recall bias. In epidemiological research, **recall bias** is a systematic error caused by differences in the accuracy or completeness of the recollections retrieved ("recalled") by study participants regarding events or experiences from the past.

<sup>34</sup> The writer has long been aware of the elevated rate of inheritance of club feet and clefts in his own hapu.

<sup>35</sup> Houghton, Philip, University of Otago, *People of the Great Ocean, Aspects of Human Biology of the Early Pacific*, Cambridge University Press, 1996, pp 237-238.

<sup>36</sup> Chapman, C., Stott, N.Susan, Port, R.V., Nicol, R.O., *Genetics of club foot in Maori and Pacific People*, J Med Genet 2000;37:680–683

- Elizabeth Craig, Gabrielle McDonald, Judith Adams, Anne Reddington, Glenda Oben, Jean Simpson and Andrew Wicken [“Te Ohanga Ake, The Health of Maori Children and Young People With Chronic Conditions and Disabilities in New Zealand”](#) for the Ministry of Health. Dunedin. New Zealand Child and Youth Epidemiology Service, University of Otago. March 2012
- Craig E, Reddington A, Adams J, Dell R, Jack S, Oben G, Wicken A, Simpson J. [The Health of Māori Children and Young People with Chronic Conditions and Disabilities in New Zealand: Series Two](#). Te Ohonga Ake series for the Ministry of Health. Dunedin. NZ Child & Youth Epidemiology Service, University of Otago. 2014.
- Cowan, S (2015) [The Rainbow Report: Understanding recent infant mortality changes in New Zealand: 2001-2014](#). Christchurch: Change for our Children Limited

Counsel for the WAI1401 claimants has called for further research in the New Zealand Vietnam veteran community. Whilst research to determine the actual incidence of birth defects in the progeny of veterans is theoretically possible, the size of the available sample would probably result in statistically limited data. Additionally there is no scientifically reliable data on either direct or indirect paternal exposure, other than anecdotal account.

There would also seem to be sufficient international research concerning Vietnam veterans, and sufficient research and data on the incidence of birth defects in the general New Zealand population, to indicate that further research would reach the same conclusions as the international research, even without controlling for the confounding factor of Maori ethnicity.

#### Probable Incidence of Birth Defects in the New Zealand Vietnam Veterans Population

The following are some broad assumptions about the incidence of birth defects in the whanau of Vietnam veterans, based on approximately 3,300 veterans who served in Vietnam:

- They and their children might have an average of about 2.4 pregnancies each;
- The veterans (and their wives/partners) would therefore have had about 7,920 pregnancies;
- The surviving children would have had about 19,008 pregnancies;
- Total pregnancies in both generations would be about 26,928;
- Round that down to say, 25,000 pregnancies, to avoid over-estimation;
- And say 20,000 of those pregnancies would have resulted in surviving children (allowing for miscarriages, terminations, stillbirths, and neonatal deaths within 28 days of birth);
- At the statistical norm of about 3 to 4% of those 20,000 surviving children, it would therefore be expected that there would be about 600

to 800 children and grandchildren of New Zealand Vietnam veterans born with birth defects.

- Even at an average rate of 2.0 pregnancies per couple it would be expected that there would be about 500 to 700 children and grandchildren with birth defects.

Whether at the higher or lower estimate that is probably a lot more than most veterans and their whanau might expect.

However, as the writer is no expert, these are broad assumptions and calculations, based on publicly available data, to illustrate the likelihood of birth defects in whanau of Vietnam veterans regardless of the alleged exposure to toxic chemicals in Vietnam.

The actual projections would need to be produced by epidemiologists, presumably from data in the NZ Birth Defects Registry<sup>37</sup> and the NZ Ministry of Health national datasets.<sup>38</sup>

### Perinatal Mortality

Based on available data, epidemiologists would be able to produce similar projections for perinatal mortality across two generations of Vietnam veterans' whanau. Those deaths would include terminations, stillbirths, and deaths of newborns within 28 days of birth (neonatal). Based on 2010 data<sup>39</sup> the rates of perinatal deaths in New Zealand (excluding terminations) were:

- Stillbirths – 5.2 per 1,000 births
- Neonatal – 3.2 per 1,000 births.

In a sample group of about 25,000 pregnancies that might indicate about 130 stillbirths and about 80 neonatal deaths.

Added to the number of birth defects that would indicate about 800 to 1,000 birth defects and perinatal deaths (excluding about 60 terminations) would be expected in the New Zealand Vietnam veteran community.

### Miscarriage

That does not include miscarriage. Estimates of miscarriage in the first 20 weeks of gestation in New Zealand vary from 1 or 2 out of every 10 pregnancies (NZ Ministry of Health<sup>40</sup>) to 1 in 4 pregnancies (Health

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<sup>37</sup> <http://nzbdrc.ac.nz/>

<sup>38</sup> <http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets?mega=Health%20statistics&title=See%20all>

<sup>39</sup> Health Quality and Safety Commission New Zealand, Sixth Annual Report of the Perinatal and Maternal Mortality Review Committee, 2012. Accessed at:

<http://www.hqsc.govt.nz/assets/PMMRC/Publications/PMMRC-6th-Report-2010-Lkd.pdf>

<sup>40</sup> <http://www.health.govt.nz/your-health/pregnancy-and-kids/services-and-support-during-pregnancy/miscarriage-and-stillbirth>

Navigator NZ<sup>41</sup>). Miscarriage is more common than most realise and very often occurs without obvious cause.

In a sample group of 25,000 pregnancies, at the lower estimate of 1 out of every 10, there would be about 2,500 miscarriages in two generations of the Vietnam veteran community. At 2 out of every 10 there would be 5,000 miscarriages. The mean, based on the NZ Ministry of Health estimate, would be about 3,750 miscarriages, which is still high, and probably much higher than most veterans and their whanau would realise.

The higher estimate of 1 in 4 pregnancies (6,250 miscarriages) seems unbelievable but is often quoted. It is also thought by some researchers that 30-50% of all pregnancies might end in spontaneous abortion, most of them within a few days or weeks of conception, and unnoticed, or mistaken for early or late menses; a natural biological correction for reproductive error.

For when one considers that a foetus develops from a single cell (zygote) formed after the merger of a sperm cell and an egg cell, and then by a process of cellular division develops into a multi-functional multi-billion cellular being, there is enormous potential for reproductive error along the way with or without teratogenic exposure and influence. And in the evolution of the mammalian reproductive process nature might have developed a biological correction for reproductive error.

Regardless of the reasons, miscarriage is common. And it's not your fault.

### Infertility

About 7% of women remain childless because of female and male infertility, while 16-20% of couples are affected by infertility at some point in their lives.<sup>42</sup>

In New Zealand Vietnam veteran whanau one would therefore expect that about 750 couples would not be able to conceive.

### Awareness of the Statistical Incidence

Veterans and their whanau may well be unaware of the US and Australian research that indicates that there is no elevated incidence of adverse trans-generational effects in the Vietnam veterans' community. Veterans and their whanau may also be unaware of the actual incidence of infertility, miscarriage, birth defects, and perinatal deaths (stillborn and neonatal) in the general New Zealand population. And that the incidence in the progeny of Vietnam veterans is probably no greater than in the general population.

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<sup>41</sup> <https://www.healthnavigator.org.nz/health-a-z/m/miscarriage/>

<sup>42</sup> Te Ara: The Encyclopedia of New Zealand. Accessed at: <https://teara.govt.nz/en/infertility-and-childlessness/page-1>

A veteran has posted this blog<sup>43</sup> about Agent Orange:

*“It happened at a Motel in Palmerston North in 1980. It was the first official reunion of Vietnam Veterans since we had all come home at different times and virtually avoided each other.*

*“The social two days for wives and Vets had been brilliant. Old mates. Lots of stories, genuine pleasure at having survived the war together.*

*“And it was special to me. The weekend brought our wives somehow into our lives for the first time. They watched and listened to men who acted and spoke just like their “strange” husbands...some light was being spread on some of the habits and actions of their chosen man.*

*“But the fun part of the weekend was about to end...*

*“It was Sunday morning...meeting time, Kangaroo-court time, shared hangover time...and a guest speaker...*

*“The dapper little Auzzie flipped over his last chart, turned to the packed hall and said:*

*“Well, there ya go Kiwis. Forget your kids’ Spina Bifida, your cleft pallets, your malfunctioning organs...*

*“Hands up all those in the room who have a child with a deformed foot! Go on! Any sort of a deformity in the foot – one or two.”*

*“He glared at us...hands on hips.*

*“Absolute silence greeted him. The hall was filled to overflowing with Vietnam Veterans and their wives...probably 200-250 of us.*

*“My wife dug me in the ribs. Looked at me. “We have one”*

*“I raised my hand, about half way. The bloke three people down the row did the same...then came a groundswell of murmuring. I looked around. Hands were going up all over the room.*

*“Bloody hell! The room was a sea of hands!*

*“Then the sobbing started...then the screaming and crying....I could not believe it...*

*“Our little Auzzie presenter from the Royal Commission of Enquiry in Canberra, Australia, threw his pen onto the table.*

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<sup>43</sup> Wilson, B., Agent Orange. Accessed at: <http://truewarstories.com/stories/agent-orange/>

*“He packed up his papers. “You are exactly the same as us. So what are you going to do about it?...”*

*“...and stormed off the stage, leaving the room in a noisy, sobbing mess.*

*“We seemed to ALL have children with deformed feet...how did that happen...no one had ever mentioned it before...I supposed it was not the sort of thing that blokes mentioned to each other on the odd occasion that we met”.*

Invalid evidence. A truer test of the causative link to Agent Orange might be to have the dapper little Aussie with the silvery tongue present the same line of patter to a group of 200 to 250 young parents with no connection to the Vietnam War. And expect the same response.

### **Birth Defects in the Vietnamese Population**

Some veterans and their families quote the incidence of birth defects in Vietnam as proof that birth defects in their own children and grandchildren were caused by Agent Orange. A few cite the evidence of jars of preserved human foetuses in Ho Chi Minh City (Saigon) allegedly deformed by exposure to dioxins and dioxin-like compounds. A few have used photographs of those jars to make their point.

#### *Vietnamese research*

The problem with that assumption and evidence is that there has been no research in Vietnam to differentiate the normal statistical incidence of birth defects from those that might (or might not) have been caused by Agent Orange.

In a review of Vietnamese research Schecter and Constable<sup>44</sup> comment that:

*“At Tu Du Obstetrical hospital in Ho Chi Minh City there is a large collection of preserved ‘monsters’; such a collection can commonly be found in similar institutions throughout the world.”*

Australian claim maker Jean Williams visited Vietnam in 2001 and wrote a book about the visit, including a detailed account of her time at Tu Du Hospital:

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<sup>44</sup> Schecter, A., Constable, J., Agent Orange and Birth Defects in Vietnam, International Journal of Epidemiology 2 2006 doi:10.1093/ije/dyl135

*“Union Carbide, Monsanto, Dow and all the infamous toxic chemical manufacturers should sent their Directors to the Agent Orange Babies Ward at Tu Du Hospital for re-education.”<sup>45</sup>*

Williams illustrated the book with colour photographs from Tu Du.<sup>46</sup> The photographs create a visual claim making effect but do not add to the evidence. Her books and her unfounded claims have influenced many New Zealand veterans and their families.

An epidemiological systematic review and meta-analysis conducted by Ngo et al<sup>47</sup> in 2006 concluded that, *“Parental exposure to Agent Orange appears to be associated with an increased risk of birth defects”*. Thirteen Vietnamese and nine non-Vietnamese studies were identified and analysed. This analysis tentatively validated the claims of extensive birth defects in Vietnam caused by exposure to Agent Orange.

Schechter and Constable comment in their review<sup>48</sup> of the Ngo article:

*“In an admirable attempt to determine whether Vietnamese research over the last decades might shed a brighter light on this question, the authors reviewed many published and unpublished papers including abstracts, submitted or presented at meetings, and posters. Very little of this material, which they then used for their meta-analysis, has undergone any significant peer review”*.

*“This article and its novel approach confirm the need for continued rigorously controlled research to definitively answer the question posed at the opening of this commentary. To date the answer is, at best, scientifically equivocal and, at worst, without valid positive scientific evidence”*.

A further 2009 review of the Ngo et al research<sup>49</sup> commented on the methodology of the Ngo analysis:

*“A recent meta-analysis [Ngo et al., 2006] has claimed that there is indeed a significant increase of birth defects in children of exposed males, with an odds ratio of 1.95. (In fact, several of the studies used in the meta-analysis also included exposed females.) Schechter and Constable 2006 have drawn attention to some of the inadequacies of this study. In*

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<sup>45</sup> Williams, J., *Children of the Mist: Agent Orange Future Generations*, Homecoming Publications, 2002, p 80.

<sup>46</sup> *Ibid.*, facing pp 104-105.

<sup>47</sup> Ngo, A., Taylor, R., Roberts, C., and Nguyen, T., Association between Agent Orange and birth defects: systematic review and meta-analysis, *International Journal of Epidemiology* 2006;35:1220-1230 doi:10.1093/ije/dyl038

<sup>48</sup> Schechter and Constable, 2006.

<sup>49</sup> Fraser FC. 2009. Does paternal exposure to Agent Orange cause birth defects? *Am J Med Genet Part A* 149A:835–836.

*particular, the analysis includes many, mostly Vietnamese, studies that are unpublished, or inaccessible for review”.*

The review concluded that:

*“... even though the unpublished articles included in the meta-analysis of Ngo et al., 2006 cannot be reviewed, the data provided in the meta-analysis present problems that render their conclusion that “exposure to Agent Orange is associated with a statistically significant increase in risk of birth defects” unacceptable”.*

The Ngo et al (2006) meta-analysis is often cited as evidence of birth defects in Vietnam caused by Agent Orange, but the analysis does not stand up to the scrutiny of the scientific process.

#### *Possible incidence of birth defects in Vietnam not caused by dioxin*

It is difficult to determine the base rate of birth defects in Vietnam. In much of the literature and comment Agent Orange is cited as the cause of all birth defects. However based on population statistics for Vietnam, and based on birth defect rates in New Zealand, these are rough but indicative estimates of expected base rates in Vietnam without the influence of TCDD/dioxin exposure:

- South Vietnam population in 1974 – est. 19,582,000
- Births per annum (15 per 1,000) – est. 293,730 per annum
- Infant mortality (16 per 1,000 births) – est. 4,700 per annum
- Defects and deformity (2% of live births) – est. 5,850 per annum
- Miscarriages (1.5%) – est. 4,500 per annum.

The above estimate of 5,850 birth defects per annum is low, given the rate of all birth defects in New Zealand in 2013 was 37.7 per 1,000 live births (or 3.77%)<sup>50</sup>. That would equate to about 11,000 per annum in Southern Vietnam in the 1970's.

However, based on the low estimate, in the thirty years after the Vietnam War it could be expected that there would have been at least 175,000 children born with defects, not caused by TCDD/dioxin exposure (or 330,000 at the current New Zealand rate).

Using similar estimates for the whole of Vietnam today (population 94.515 million, birth rate 15.7 per 1,000) there would be about 30,000 children born with birth defects annually, not attributable to TCDD/dioxin, or about 56,000 per annum using the higher New Zealand rates.

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<sup>50</sup> New Zealand Birth Defects Registry Prevalence of Selected Defects Reported to the International Clearinghouse for Birth Defects Surveillance and Research, 2103. Accessed at: <http://nzbdr.ac.nz/assets/Uploads/2013-Annual-Data.pdf>

Defects in children at orphanages and hospitals are routinely attributed to Agent Orange but without testing for dioxin exposure (at \$US1,000 per test) there is no evidence, and no incentive to do that research. Children with birth defects are often left at orphanages with no identification or indication of where they might be from.

### *Dioxin “hotspots” in Vietnam*

Extensive research by Hatfield Consultants of Canada<sup>51</sup>, in conjunction with Vietnamese Health Authorities and funded by the Ford Foundation, has identified 18 “hotspots” in southern Vietnam where there is still evidence of very high levels of dioxin in the environment, in the food chain, and in the population. These are all in locations where the various Agents were stored, mixed and loaded into spraying aircraft. Three of the most contaminated are at former US airbases at Da Nang, Phu Cat and Bien Hoa. Contamination was caused by spillage, emergency dumping, and by the improper cleaning and disposal of empty drums.

Those “hot spots” were the airfields where the USAF Ranch Hand flights originated, and where servicemen would most likely have been affected. However the forty-year longitudinal Ranch Hand study has not found any significant increase in health and reproductive effects in those servicemen who stored, mixed and sprayed the defoliants at those “hot spots”.

Apart from those “hot spots”, in all other areas surveyed, including areas that were extensively sprayed, the consultants did not detect any residual dioxin in the environment or population. Veterans sometimes quote the contamination at the “hot spots” as evidence of contamination in sprayed areas. The contamination in “hot spots” would have been in much higher concentrations than contamination in sprayed areas. There is no record of residual contamination levels in sprayed areas at the time of spraying, and in the few years afterwards when New Zealand soldiers were in Vietnam.

### *The propaganda war*

The war in Vietnam was as much a propaganda war as a shooting war, or a chemical war. Both sides were heavily engaged in propaganda, truth famously being the first casualty in war. From the US, Korean, Australian and New Zealand perspective the shooting war and the chemical war were both ultimately lost. Vietnam also won the propaganda war and a large part of that war was about the use of chemicals and about the alleged war crime of chemical use. That propaganda continues today at the War Remnants Museum and Tu Du Hospital in Ho Chi Minh City.

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<sup>51</sup> Hatfield Consultants, January 2006, Identification of New Agent Orange/Dioxin Contamination Hot Spots in Southern Viet Nam Final Report, A Project Implemented by 10-80 Division, Ministry of Health, Viet Nam and Hatfield Consultants Ltd., West Vancouver, BC, Canada.

There is no way to disentangle the propaganda from reality, although there are undoubtedly dioxin related health effects in and around the 18 “hot spots”. Without extensive testing of the children who are said to be affected by exposure to dioxin there is no way to determine the real incidence of dioxin related defects, over and above the incidence that could normally be expected in Vietnam.

Similarly there is no way to differentiate between the normal statistical incidence of disease and disorder in Vietnam, and that which is said to have been caused by exposure to dioxin, except in those 18 “hot spot” locations.

Agent Orange claim makers in the USA, Australia and New Zealand frequently cite birth defect rates in Vietnam to reinforce their own birth defect claims.

### **An Example of Misrepresented Science**

All too often the science of reproductive disorder is cherry picked to prove a point and, as this exchange shows, it is often a point that bears no resemblance to what the science actually states. The subject email confirmed what many believed about the transmission of Agent Orange reproductive disorders through sperm (or spermatogenesis), or so they thought.

In October 2012 a veteran and prominent claim maker posted a scientific article<sup>52</sup> in an email to the Kiwi-Vets email group at Yahoo with the subject heading, “*The scientific evidence that Dioxins are transmitted intergenerationally via sperm*”.

He hadn’t read the article.

The heading completely misrepresented the article. It actually described epigenetic research that showed that three groups of toxins cause intergenerational effects when the mother in the first generation is exposed during gestation. It was not about dioxin being transmitted from an exposed father in his sperm.

The veteran who posted the article probably did not create that subject heading himself as the article was forwarded to him by Queenslander Dr Kenneth J. O'Brien (PhD), CEO: Families After Trauma Foundation, Director: Children & Grandchildren of Vietnam Veterans Network,

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<sup>52</sup> Manikkam M, Guerrero-Bosagna C, Tracey R, Haque MM, Skinner MK, Transgenerational Actions of Environmental Compounds on Reproductive Disease and Identification of Epigenetic Biomarkers of Ancestral Exposures, PLoS ONE 7(2): e31901. doi:10.1371 / journal.pone.0031901, 28 February 2012. Accessed at:

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0031901>

Managing Director: More Than Normal. O'Brien had probably not read the article either.

The veteran got the article attached to an email from a seemingly knowledgeable specialist (O'Brien) and took it at face value, especially as it seemed to confirm a long-standing claim.

Dr O'Brien describes himself on LinkedIn<sup>53</sup> as an Epigenetic Mental Health Specialist thus:

*"I provide occasional specialised advice and support for clinical and research practitioners and students on the heritability of mental disorders. My area of specialty is Post Traumatic Stress Disorder. I also facilitate workshops and conferences on optimising individuals and families experiencing these growing range of misunderstood conditions and provide 1-on-1 and couples counselling".* He also wrote that his services included, *"Epigenetic, neurological, psychological, cultural and sociological support to clients"*.

O'Brien certainly is not an epigenetic scientist or a neurologist. He overstates his area of expertise on LinkedIn. He is a psychologist. His qualifications are:

- (1) Bachelor of Arts in Psychology & Corrective Services,
- (2) Bachelor of Social Science (Hons) in Educational Psychology,
- (3) Master of Social Work in Health Services / Allied Health / Health Sciences,
- (4) PhD in Intergenerational Mechanics of PTSD.

In a follow up email another veteran and prominent claim maker wrote, *"Hi, This was presented to the Select Committee from information given to me by John Moller many years ago."*, indicating that he hadn't read it either. John Moller had certainly for some time been a proponent of the idea that the adverse effects of Agent Orange exposure were transmitted inter-generationally in the sperm, but the epigenetic information in the article was not available at that time. And it didn't say what the second veteran thought it did.

There was no evidence in the email exchange that anyone actually read any further than the subject heading; except for this writer.

The Kiwi-Vets and KiwiVets email groups have long been vehicles for disseminating claim making information, including claims about the intergenerational transmission of reproductive disorders. Claims are only occasionally challenged and then only by one or two other veterans. The consensus seems to lie with the claim makers regardless of the veracity of the claims.

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<sup>53</sup> <https://www.linkedin.com/in/dr-kenneth-j-o-brien-b4554118/>

The point being that Vietnam veterans email and discussion groups are questionable sources of reliable and evidential information, and no substitute for proper research. The same could be said of the media.

## **Conclusions**

Birth defects are a lot more common than you might think, and there are multiple causes both known and unknown.

### *Scientific Proof*

The science concerning infertility, miscarriage, birth defects, and perinatal mortality in the whanau of Vietnam War veterans is conclusive. International studies to the present day indicate that there is no current scientific evidence to substantiate the claim that paternal exposure to Agent Orange has caused adverse reproductive effects in the progeny of Vietnam veterans.

Additionally, and contradicting the claim making, teratogenic science holds that even the most potent teratogenic agent (such as TCDD/dioxin) cannot produce every malformation.<sup>54</sup> It is biologically impossible for Agent Orange to have caused all of the claimed conditions.

It is not your fault.

### *Presumption<sup>55</sup>*

Other than the anecdotal evidence of veterans and their families there is insufficient evidence of correlation or association to justify presumption.<sup>56</sup> Presumption loosely based on science will not stretch inter-generationally in the absence of any discernable association with alleged or presumed paternal toxic exposure.

Even so, in the USA, Australia and New Zealand a few birth defects (five in New Zealand) have been accepted presumptively, in the absence of proof, as a result of political intervention; a situation unlikely to be reversed.

Note: At least two of the accepted conditions in New Zealand are actually presumptively associated with the children of female veterans in the USA. In translation from the USA they were also transgendered into New Zealand during the negotiations leading to the 2006 Memorandum of Understanding.

### *Resolution*

The social problem, or *Mamae*, the belief in adverse trans-generational effects caused by paternal exposure to Agent Orange and other chemicals,

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<sup>54</sup> Shenoy & Kamath, p 108.

<sup>55</sup> See my previous paper on presumption, the policy device used to attribute conditions to war service in the absence of scientific and medical proof.

<sup>56</sup> NAS 2014.

and the consequent guilt, fear and anxiety in the Vietnam veterans' community, is a pressing and important social problem.

In the absence of any proof or even any indication that the conditions in the children and grandchildren are related to Agent Orange/dioxin there needs to be a complete reassessment of the problem and a search for a possible resolution.

It is a very real social problem that has afflicted many whanau in the Vietnam veteran community. And it is an inter-generational problem with no resolution or end in sight at present.

Perhaps the most effective but least likely resolution would be for Vietnam veterans and their whanau to accept the evidence, disown the Agent Orange narrative, and banish the anxiety, the fear and the guilt.

So

If you believe that you were exposed to the dioxin in Agent Orange, you weren't.

If you believe that you were exposed and that Agent Orange caused the birth defects in your children and grandchildren, you weren't and it didn't.

The birth defects are not your fault.